

# **“Taliban Resupply Vehicle” To “Terminator”**

Progress In Armor, Armament, Situational Awareness, Target Designation and Illumination  
&  
The Proposed Missions They Support

By:

**Howard D. Kent, Armor Development Group, LLC**

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## THE FOLLOWING IS A PUBLIC SERVICE ANNOUNCEMENT ON THE CATCHY TITLE:

We are here to celebrate two legends in the field of modern robotics;

One, **the Urban Legend that any U.S. Armed Robotic Vehicle was ever captured by the enemy, carried off and it's weapons used by the Taliban against us.** It simply never happened and in lieu of argument we have foil lined baseball caps available in the back for those who think it did... get 'em while they're hot.

And...



Two, **the Screen Legend of James Cameron's T-1000 Terminator...the goal of every robotic designer;** a strong, autonomous, self powered and powerful computer capable of seamlessly blending in with humans. Of course, the completely ruthless, evil drone programming in the original was a problem, fortunately almost completely worked out by screenwriters prior to "T2".

Copyrights 1984, 1991 By 20<sup>th</sup> Century Fox, James Cameron & Gale Ann Hurd, *et al.*

Introduction By:

M. David Ahmad, Chief  
US Army PEO Future Weapons

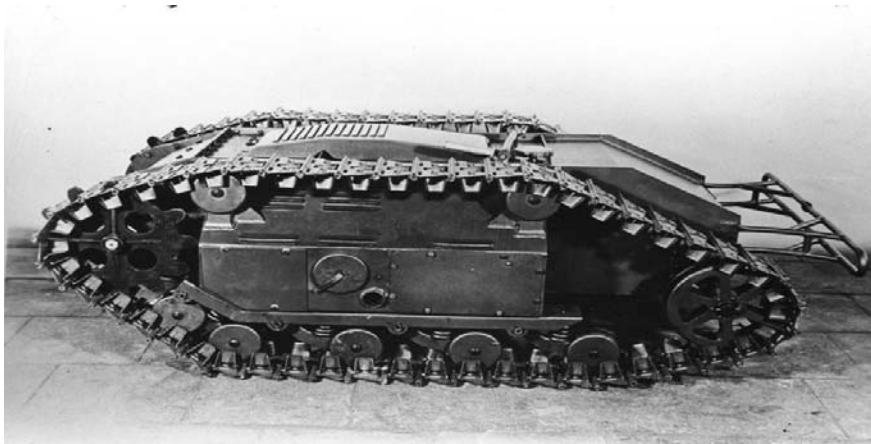
Presented By:

Lt. Col. Shawn Lucas, US Army  
OIC, PM Individual Weapons

## **Topic:**

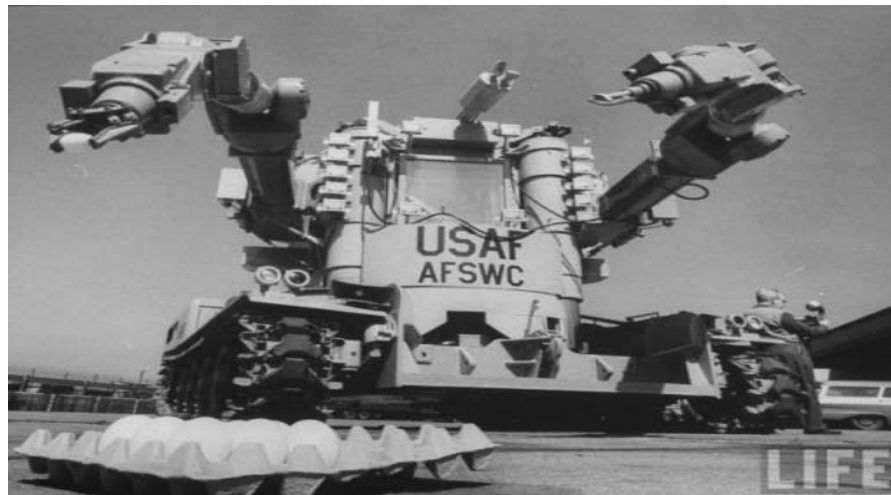
Development Of Dedicated Robotic  
Weapons For The Future Force:  
Beyond Adapted Infantry Weapons

## Early Ground Combat Robots: Wire & Radio Controlled Vehicles



Clockwise From Top: German (WW-II) Sprengpanzer "Goliath" Wire Guided Robotic Bomb, Japanese (1930) Radio Controlled Tank, Soviet Union (1922) Radio Controlled Tank.

## Post War – September, 11, 2001, Experimental & Engineering Vehicles:



Clockwise From Top: Life Magazine Photo USAF Tele-Operated Engineering Vehicle (1960s), US Army M-60 Based Panther , FMC M-113 Based Autonomous Test Bed Vehicle

## Modern Use Of Combat Robots, 2001 Onward:



Clockwise From Top Left: US DOE Robotic Patrol Vehicle, Israeli Guardium Robotic Patrol Vehicle, iRobot SUG-V, iRobot PackBot, iRobot Warrior, GDLS Guardian, iRobot SUG-V With PSS Mine Detector, iRobot Warrior With Claw Equipped Heavy Lift Manipulator Arm.

## Future Combat Robots; Potential Tele-Operated Vehicles Based On Current Types



Clockwise From Top Left: GD M-1 Abrams A2 SEP, German Leopard II, FMC Experimental M-113 Assault Gun, FMC M-113 Gavin Up Armored RWS, US Army FCS 105mm (Stryker 105mm), Husky Engineering Vehicle

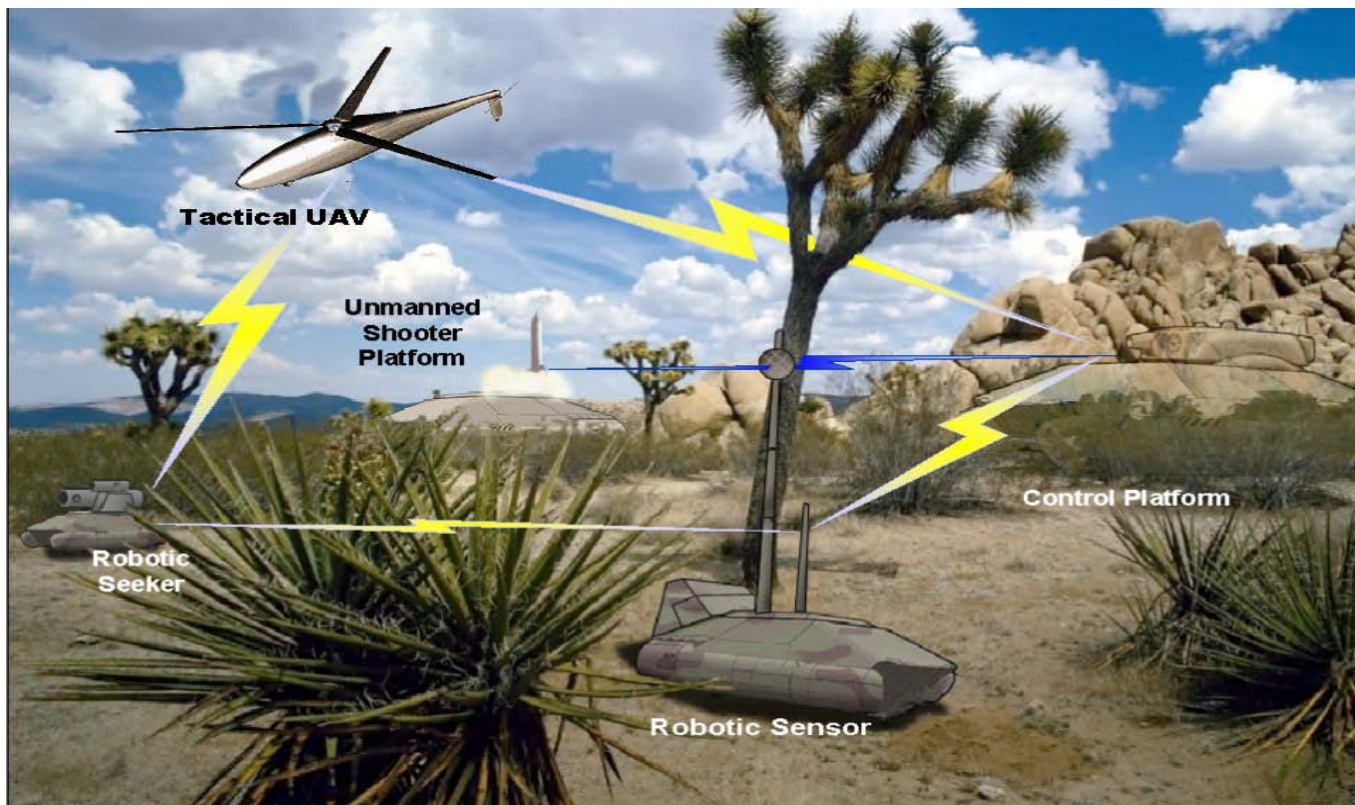


## Future Combat Robots; Tele-Operated & Autonomous Vehicles



Clockwise From Top Left: US Army Crusher Vehicle, UK Digger Mine Flail, USN SPAWAR FIRRE, Australian IMDV, Robotics Technology Center Vehicles, DARPA AVRL Scout Vehicle.

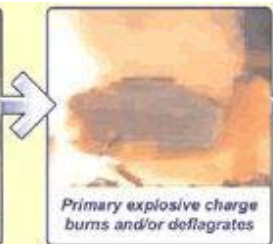
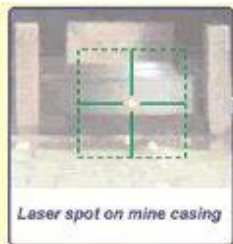
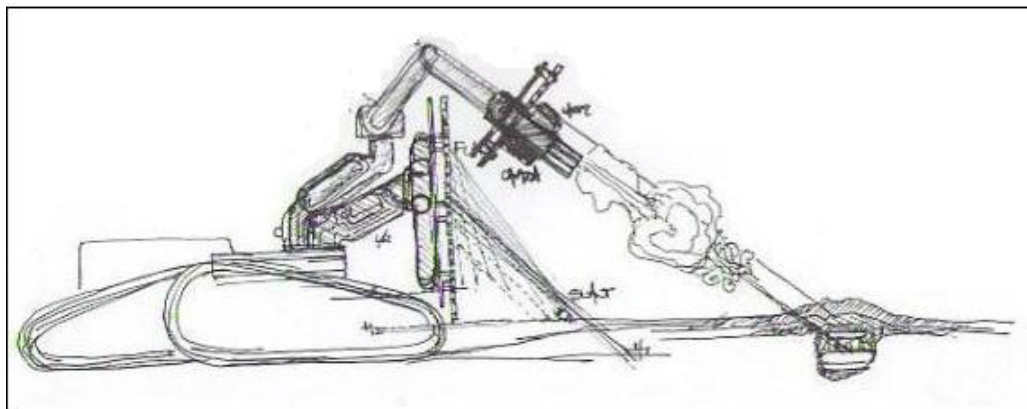
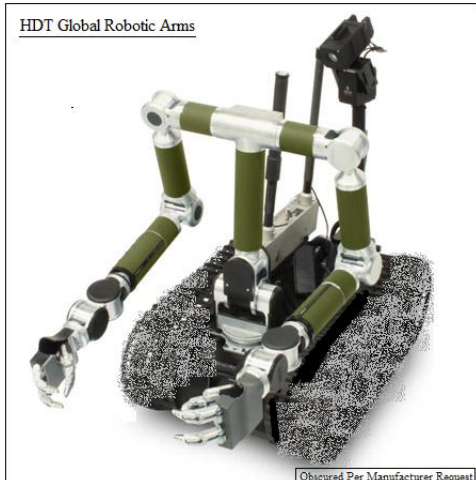
## Future Combat Robots; Tele-Operated & Autonomous Vehicles



Clockwise From Top Left: DARPA Vision; Teamwork Between Control Platform, UAS, Mobile Ground Detection Sensors, Reconnaissance Vehicles, And Unmanned Shooter Platforms.

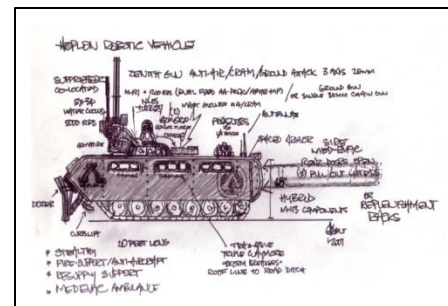
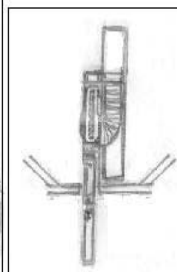
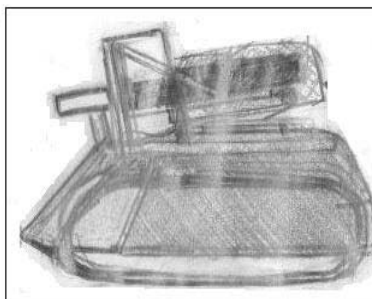
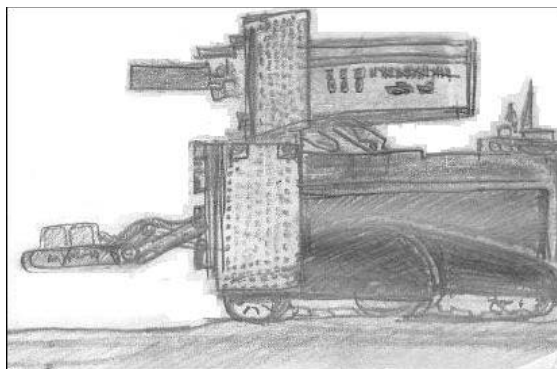
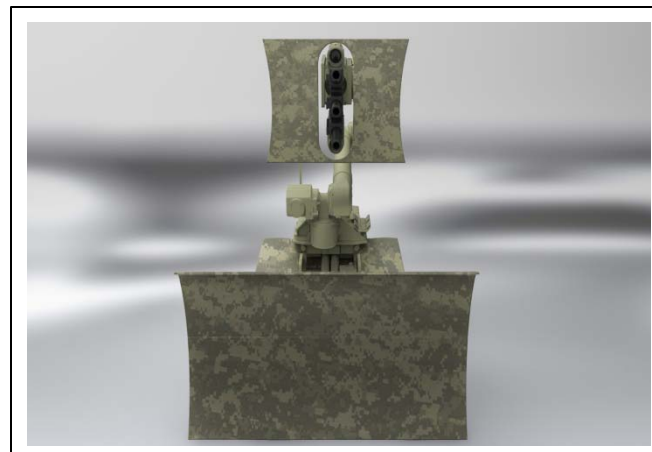
## Future Combat Robots, New Missions: Improved Explosive Ordnance Disposal

HDT Global Robotic Arms



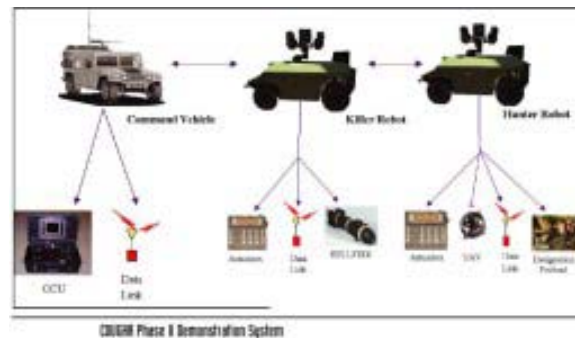
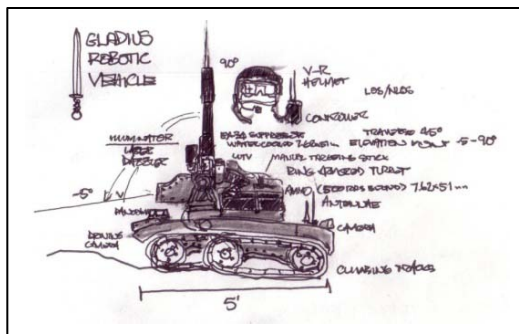
Clockwise From Top Left: HDT Global Robotic Hands, ADG Concept Gunfire Ordnance Destruction With Royal Arms Multi-Shot Disruptor & Retractable Blast Armor, L-3 PSS-13, Chatten Stereo EOD Turret, Coherent Corporation CO2 Laser, US Army THOR Laser Thermal Effect Landmine Destruction Examples.

## Future Combat Robots; New Missions: CQB & Delaying Action



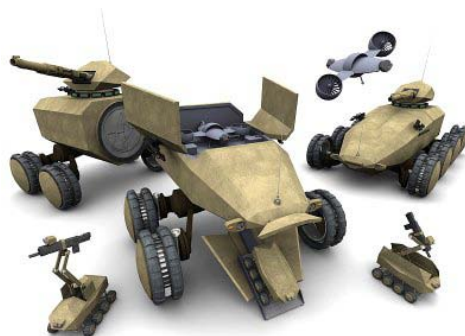
Clockwise From Top Left: NY Times Graphic, ADG Concept iRobot Warrior Gunfighter, ADG Concept iRobot Warrior Disruptor/Non-Lethal Platform, 2001 ADG Hoplon M-113 Based FSV/Resupply/Combat Ambulance, ADG Gunfighter Robot Armor Concepts: Turret Armor, Frontal Arc STANAG 2, Body: NIJ-III/A/Fragmentation.

# Future Combat Robots; New Missions: Spec Ops, PGM Targeting & Ambush



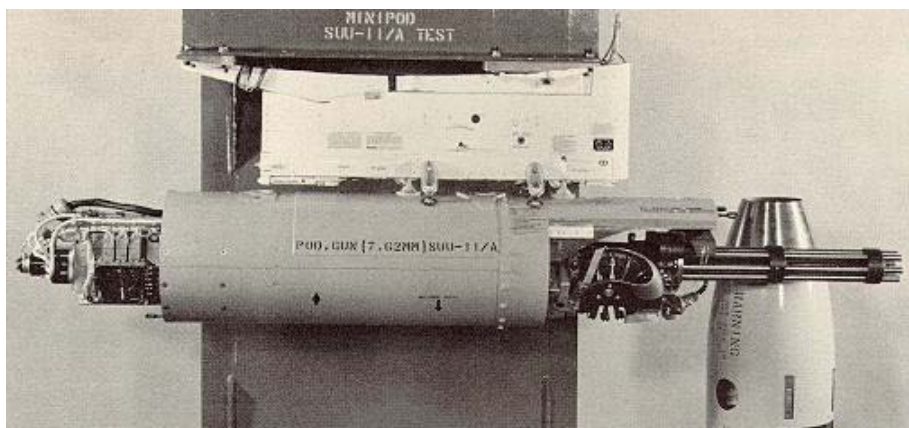
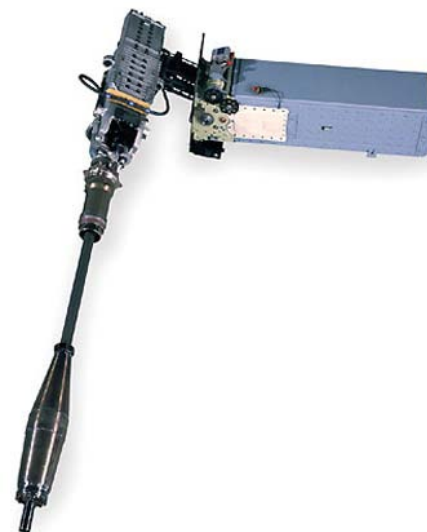
Clockwise From Top Left: 2005 ADG Gladius Concept, MDBA CVS-101, DARPA Cougar GRV Diagram, Cougar Transport & Firing Hellfire, Wired Magazine Photo Of US Army Exercise With Unmanned Ground Vehicle.

## Future Combat Robots; New Missions: Supply, Reconnaissance & Fire Support



Clockwise From Top Left: DARPA Future Combat Vehicles, Popular Science-British MOD Image, Howe & Howe Ripsaw, DARPA Future Combat Vehicle, Popular Science-British MOD Image, BAE Black Knight.

## Future Combat Robots; Robotic Adaptability To Aircraft Weapons

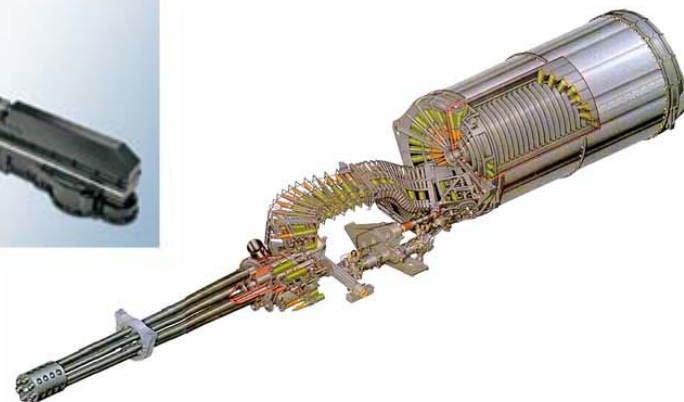


Clockwise From Top Left: Self Contained, Externally Powered Armament: AH-1 Cobra 40mm/M-134, Dillon Aero M-134, Mauser 27mm Aircraft Cannon, FN Rocket & HMG Pod, GE SUU-11 20mm Cannon Pod.

## Future Combat Robots; Near Term Offensive & Defensive Armament



Clockwise From Top Left: ATK 30mm, 7.62 NATO Chain Guns, Meggitt M-1 120mm Autoloader, GE GAU-8, Self Powered Rheinmetall 50, Concept Multi-Weapon Remote Control Turret.





## Future Combat Robots; Near Term Offensive & Defensive Armament



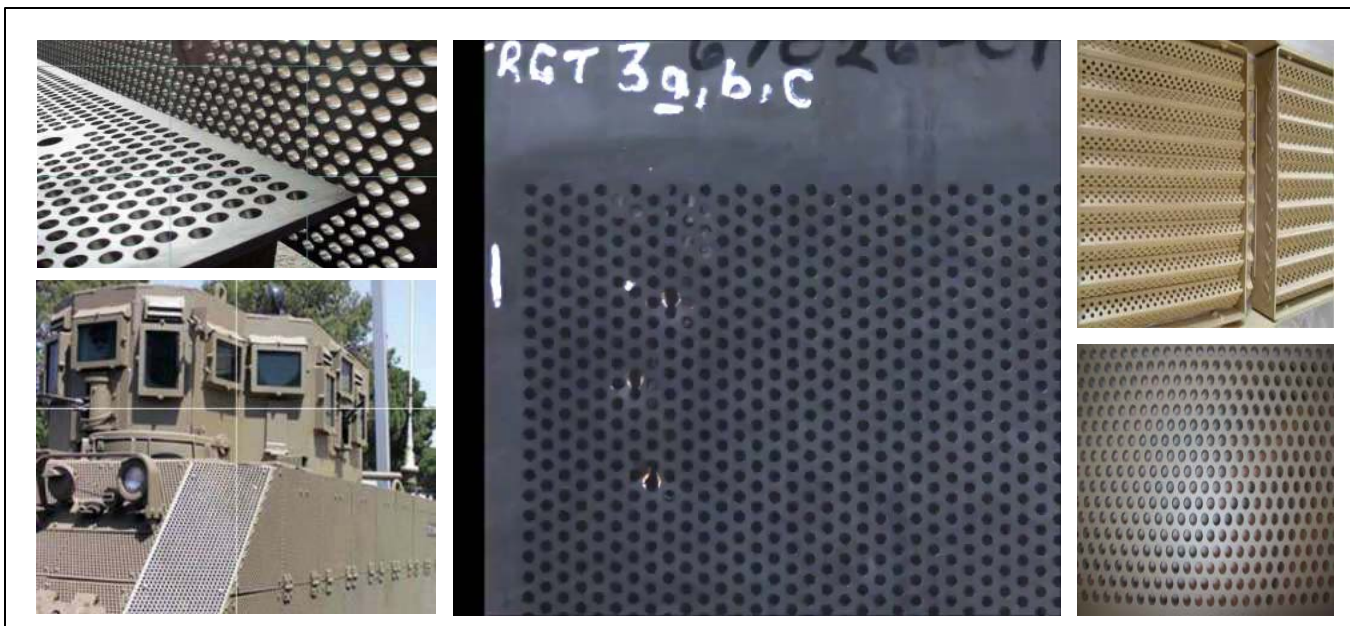
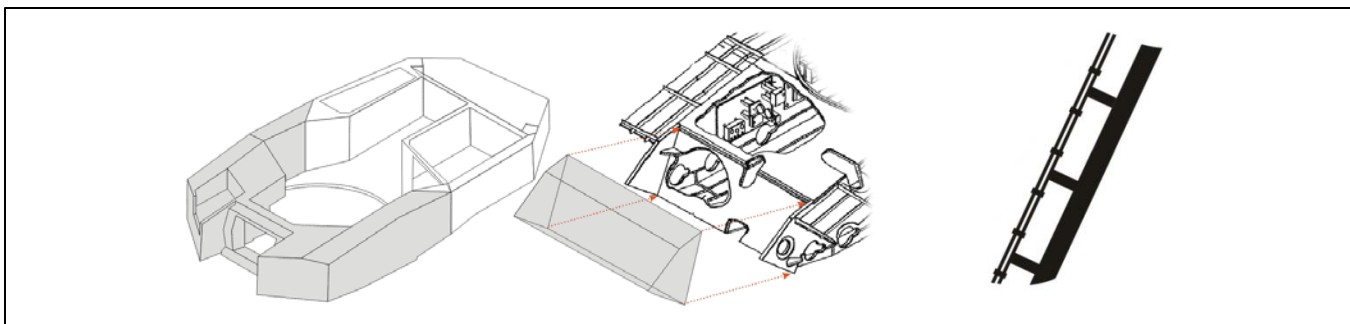
Clockwise From Top Left: Raytheon Ground Launched Hellfire, ROK 70mm MRL, Soviet Flame Rocket Tank, South Korean 70mm MRL, Hughes FOG-M, ATK 70mm Hydra Rockets, ATK APKWS, IMI Mini-Spike AP-ATGM

## Future Combat Robots; Near Term Offensive & Defensive Armament



Clockwise From Top Left: Royal Arms Disruptor / Breacher / NL / AP Projectors, MetalStorm 40mm, Array, ATK Spyder AGL, ATK EFP Off Route Mine, Dynamit- Nobel Modern Claymore, TASER Multiple Projector, Italian Anti-Personnel Mine, US Flamethrower, Lasers: THOR Mine Destruction, BE Meyers GLARE, Coherent CO2 Modules.

## Future Combat Robots; Near Term Frontal Arc & Spaced Armor Concepts



Top: Krauss-Maffei Leopard 2 Frontal Arc, Spaced Armor Diagram. Bottom: MTL IMPAS Lightweight Armor

# Future Combat Robots; Near Term Deployment Concepts

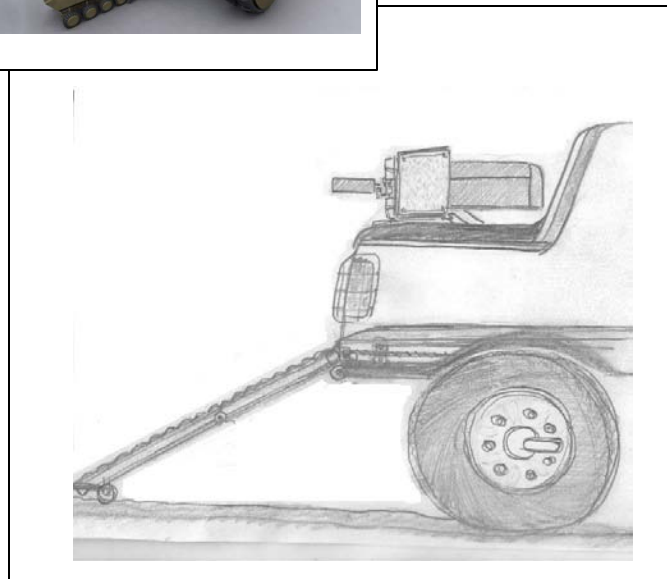
Manually Deployed & Stowed:

VS.

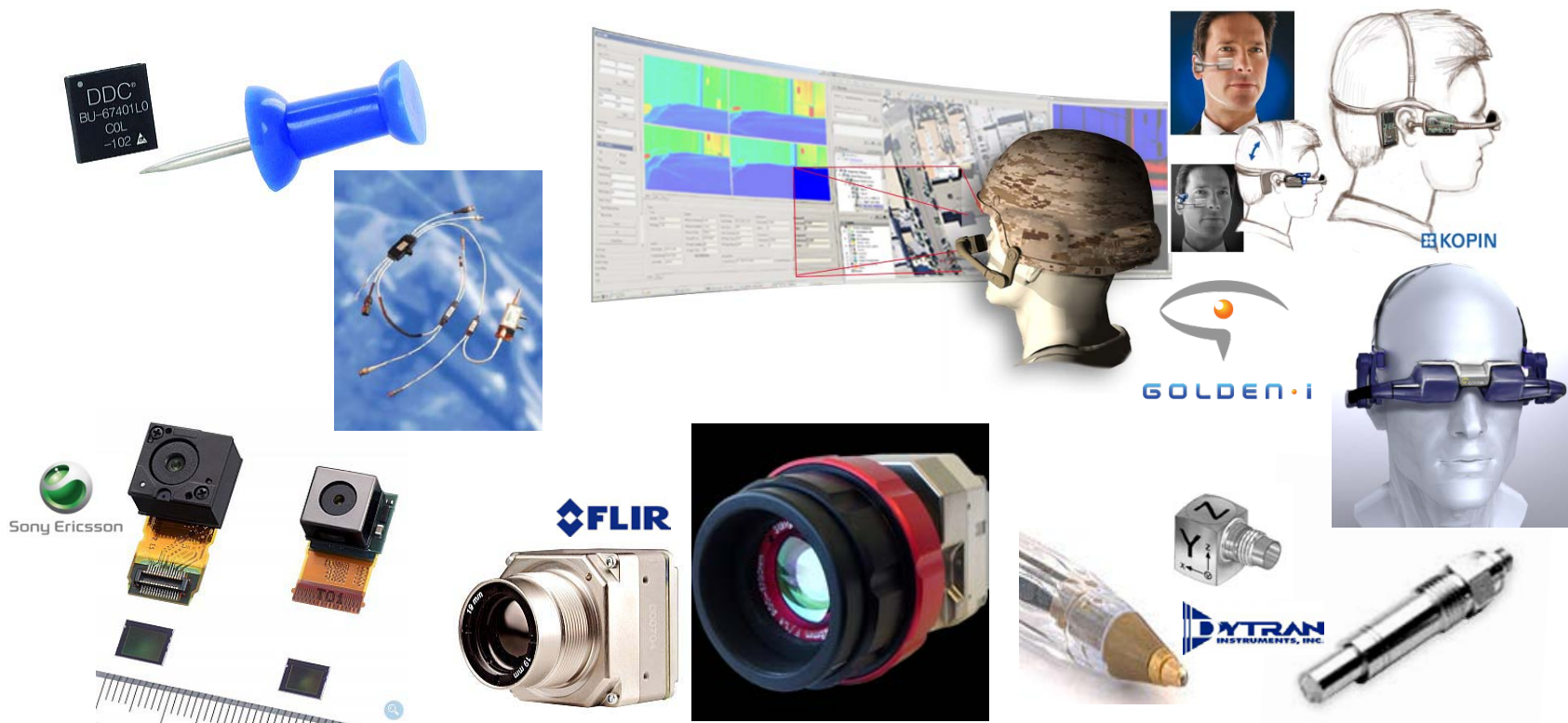
Automatic Offloading & Retrieval:



US Army, DoD Photos



## Future Combat Robots; Near Term Sensors & Situational Awareness



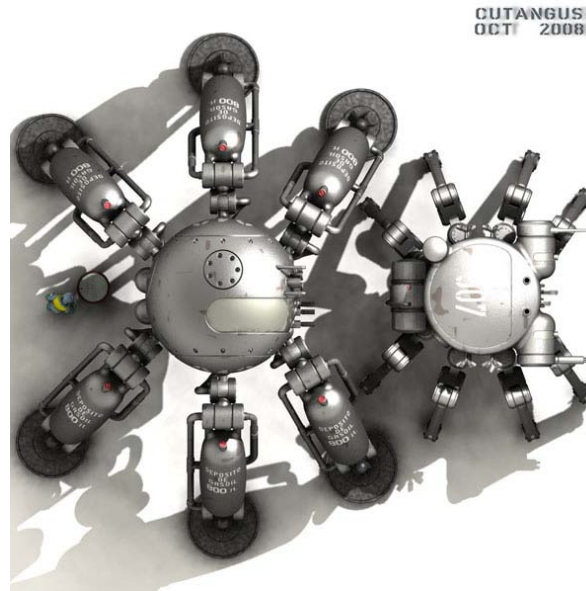
Clockwise From Top Left: CDL Mini-1553 Node, 1553B Harness, Kopin Golden-I Headset Dual Core PC View, Kopin Golden-I Monacle, Kopin Golden-i VR Goggles, DYTRAN Sealed Pressure Transducer (Microphone), DYTRAN Miniature Tri-Axial Accelerometer, FLiR TAU SWIR Miniature Thermal Camera, FLiR Quark Ultra-Miniature Thermal Camera, Sony Exmor High Resolution 14.7mP Cell Phone Camera With 5x Optical & 10x Digital Zoom.

## Future Combat Robots; Futuristic Concepts



Clockwise From Upper Left: Deviantart.com Mjollinir FSV, Ben Mauro AMP Vehicle, BAE Raider Concept, Howe & Howe Ripsaw Vehicle, HP High Energy Laser Vehicle, BAE Spaced Armor Armed Engineering Vehicle Concept.

## Conclusion:



- The Future Is Coming...
- There Will Be Combat Robots In It...
- Let's Make Sure We Have Them...

-HK

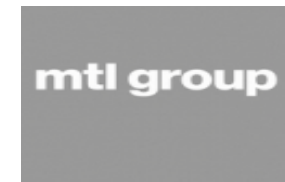
Credits:



With Special Thanks To:



LTC. Thomas Henthorn, US Army-Ret.  
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