Armor Mechanics Branch AIAD Summer 2004

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Agenda

- RDECOM Armor Survivability Kit (ASK) development
- Airborne Armored Ground Mobility Vehicle (AAGMV)
- Considerations for armoring light tactical vehicles

Situation:

Standard Issue HMMWV

Improvised Explosive Device

Destroyed HMMWV

ASK Background

- August 2003: Can you stop RPGs with chain link fence?
- September 2003: Can we design an armor solution to stop IEDs and small arms fire?
- October 2003: 20 prototype kits made for testing and fielding in Iraq.
- December 2003: 1000+ kits made and fielded in Iraq.
- July 2004: 8000+ kits made, 2000 more on order

ASK Kit Description

- Significant, immediate, survivability upgrade.
- Provides crew protection against Small Arms weapons at close range (protects against AK-47 drive-by shootings).
- Provides crew protection against certain blast and fragment

- ASK 4-door kit: 1,300 lbs. $9,570
- ASK 2-door kit: 980 lbs $6,200
- Can be installed in unit motorpool in 2.5 hours.
- Began as an expedient solution for the most exposed soldiers.

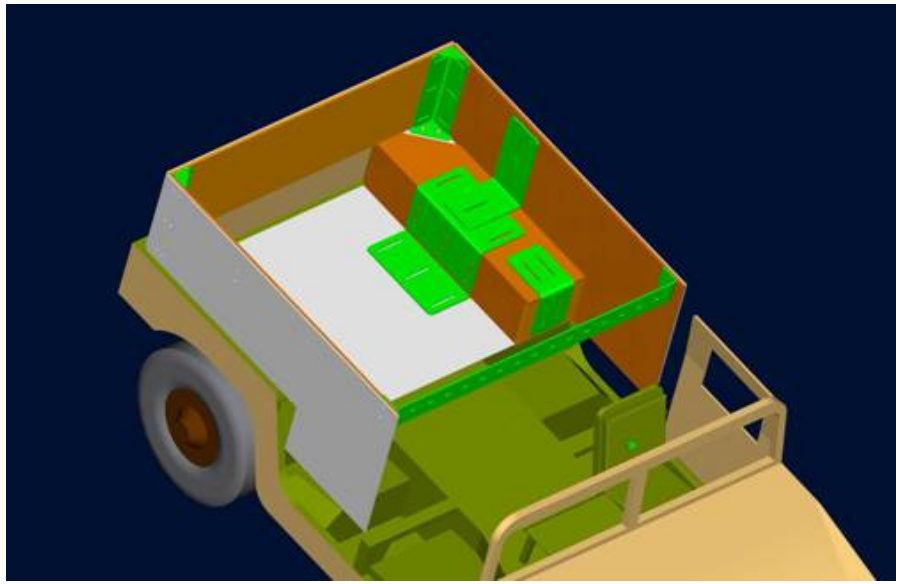
Problems

- ASK is a stopgap measure
  - Designed to be fielded as quickly as possible
  - Uses steel- is heavy → more wear and tear
  - We can do better
  - No protection for soldiers in rear of 2-door HMMWVs

- Can we field an armor kit that is lighter and has better armor characteristics?

ASK Kit Future

- 11,000 – 12,000 ASK's total
- Transition to the AAGMV
  - Operational by OEF March 2005
  - 1,080 vehicles required for one UA
  - Integrally designed armor, not an afterthought

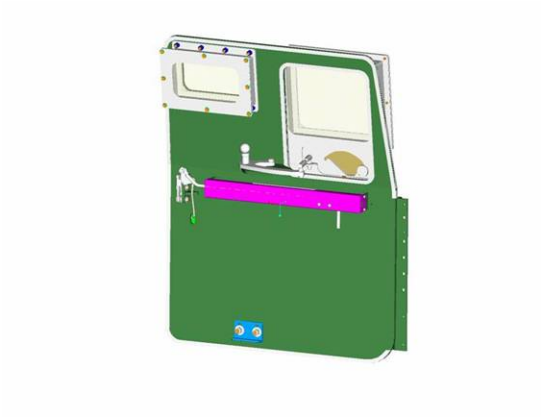


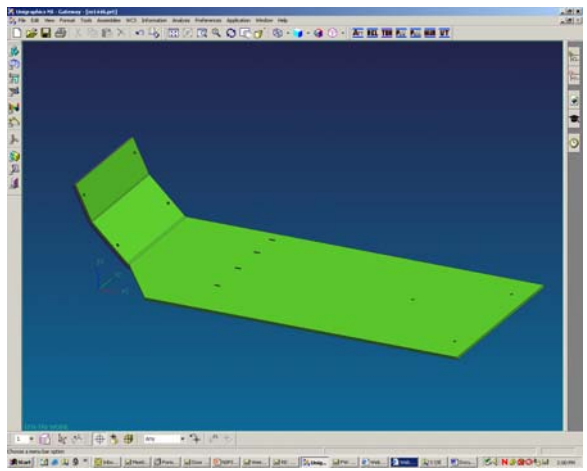
AAGMV

- Airborne Armored Ground Mobility Vehicle
- Prototype constructed and shipped to ATC by 18th ABN Corps
- **1,080 AAGMV's required to outfit one Unit of Action**
- An expedient solution to transport 9 Infantry troops in a HMMWV
- "Troop Box" design to protect rear area of vehicle
- Centerline Bench Seat (Modular and Removable)
- Capable of mounting four machine guns (360 degree coverage)

AAGMV Issues

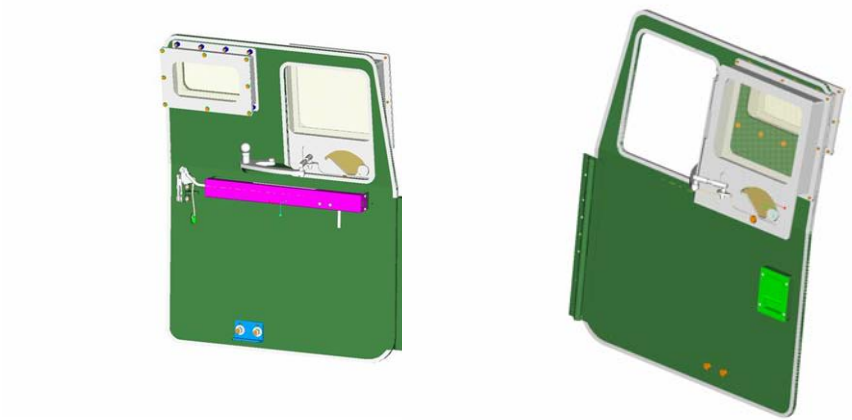
- Underbody Protection
  - Are Mines a Threat?
  - Should a “bolt-on” solution be made available if mines become a problem?
- Door design
  - Original half door
  - ASK Door
  - USMC door
- Overweight
- End User Interface
  - Is this what the soldiers want?





COTS

- Underbody- Armorworks
- Windows- O'Gara-Hess & Eisenhardt
  - TARDEC
  - ARL Design
- USMC Doors-
  - Ballistic glass
  - Firing port
  - Good latch



Ballistic Panels

- .375” RHA is too heavy
- .202” High Hardness Steel
- Kevlar / S-2 Glass backing
- Rhino Lining Appliqué / backing

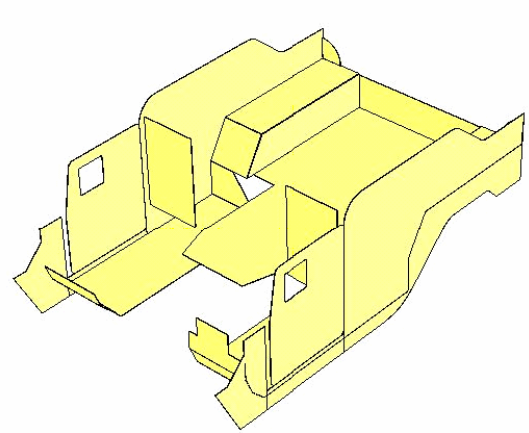
Materials Selection Criteria

Is it Affordable? Is it Available? Can it be Manufactured Quickly?

Material	Mat'l Cost	Availability	Manufact. Speed	Weight	Threat/Perform.
3/4" Kev	$20/# (5#/ft2)	Med Risk	Med/High Risk	1.3	lrg/ fail
1" Poly	$??/# (6#/ft2)	Low Risk	Low Risk	1.4	lrg/ fail
2" Plywood	$??/# (10#/ft2)	Low Risk	Low Risk	1.4	lrg/ fail
1" Al	$3/# (14#/ft2)	Low/Med Risk	Low Risk	2	lrg/ pass
3/8" Mild St	$1/# (15#/ft2)	Low Risk	Low Risk	2	lrg/ pass
3/8" RHA	$1/# (15#/ft2)	Low Risk	Low Risk	1	med
1" RHA	$1/# (40#/ft2)	Low Risk	Low/Med Risk	2.6	lrg
2" Al	$3/# (28#/ft2)	Med/High Risk	Low/Med Risk	2	lrg

AAGMV Weight Savings

942.11 lbs saved



.375” thick RHA coverage

Total Weight: 2629.35 lbs

.202” thick HH/ .31” Kevlar

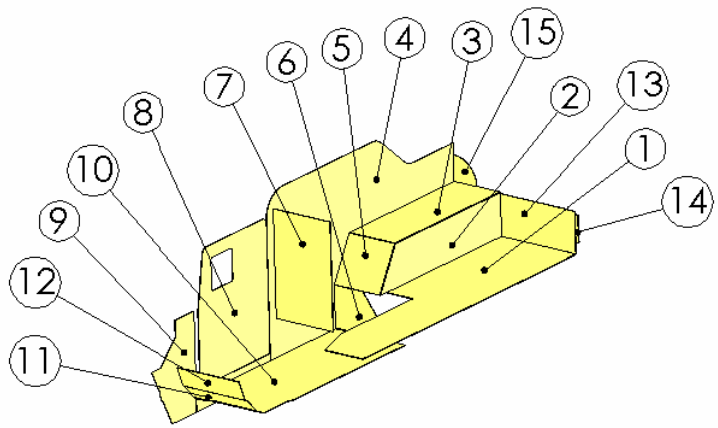
Total Weight: 1687.24 lbs

.202” thick HH coverage

Total Weight: 1416.34 lbs

.202” thick HH/ .22” S-2

Total Weight: 1719.45 lbs



Thanks

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