Post-Combat Survey Report #2012-3

Prepared by
Test and Evaluation Office
Capabilities Development and Integration Directorate
Maneuver Center of Excellence

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Executive Summary

This report provides a summary and analysis of Leader feedback from a Post-Combat Survey of 116 Officers from the Maneuver Captains Career Course with experience in Iraq and Afghanistan.

Small Unit Operations. Officers are confident in both internal/external weapon systems to defeat enemy threat, but external assets are perceived as more effective. Most Soldiers are not properly trained to conduct defensive operations. More training is needed on defensive operations, especially for units conducting sustainment efforts. Basic battle drills are the most essential platoon capability and the ability to lead battle drills is the top Leader requirement. The physical strength and endurance of Soldiers to meet the challenges of battle is a very high concern for Leaders. Leaders believe a platoon's capability against a target should match the distance positive identification can be made. There are no easy or reliable means of positively identifying enemy forces mixed with civilian populace. Leaders recognize the need and utility of more cultural awareness and civil affairs training.

Combat Engagements. Nearly all engagements were initiated by the enemy, most occurring between 300 to 400m range during daylight hours. Company mortars are considered the most responsive support system due to speed of clearance of fires. Close Air Support is considered the most effective system at forcing the enemy to disengage from direct fire engagements. The enemy was able to achieve a tactical advantage by leveraging superior knowledge of the terrain or urban infrastructure.

Soldier Weapons. Nearly all weapon systems are considered effective, except the M9 pistol. There is a recognized need for having a school-trained Small Arms Weapons Expert at the platoon level. A small number of Leaders had experience with the new Enhanced Performance Round 5.56mm round, with nearly all considering it an improvement over M855 ball ammunition. Platoons require more variety and greater access for organic weapon systems. Lighter, more lethal individual weapon systems are desired. Pyrotechnic signaling remains a critical capability. Units need better nonlethal options to support sustainment operations and deal with local civilian populace. Enemy troops in rock formations are frequently engaged with TOW/Javelin missile systems. Hand Grenade safety messages are not disseminated to the lower leadership level.

Soldier Protective Equipment. The Soldier Plate Carrier System was considered more effective than the Improved Outer Tactical Vest. The reduced coverage is a risk Leaders find acceptable for greater mobility. Leaders do not fully understand the risks associated with altering/removing helmet padding. Wear of the Advanced Combat Helmet becomes uncomfortable due to instability with mounted night vision enhancers. The OEF Camouflage Pattern uniform is considered an improvement, but durability remains an issue for Soldiers. Comfort and durability of personal equipment are the most frequently cited areas for improvement. The majority of Officers purchased their own commercial GPS for their deployment. Most spent over $500 on commercial equipment.

Mounted Systems. Mobility was limited by the size of vehicles and accompanying protection systems. The RPG kit decreased the perceived effectiveness of vehicles. Lighter, more maneuverable or dedicated combat vehicles were more frequently rated effective; Up-Armored HMMWVs were rated higher than some MRAPs. Although opinions are divided over fielding one vehicle per squad or one per team, Leaders stated any future ground combat vehicle should provide both 360 degrees situational awareness for the crew and be able to transport a fully equipped 9 man squad. Most Leaders believe mounting a missile system on the MRAP is a required capability. A means for self recovery was the most desired capability.

Gunfire Detection Systems (GDS). Most officers rated the Boomerang GDS ineffective, likely due to a lack of maintenance support and low operational readiness rates. Few received any formal training on the Gunfire Detection System they were expected to use in theater. There is no emphasis on sniper awareness training once deployed.

Mission Command Systems. All radio and mission command systems were considered effective. FBCB2 BFT was the most commonly used mission command system, although it lacked the ability to track dismounted elements. Trailer Mounted Support System satisfied workspace needs at multiple command post levels. Mission Command System Integration/Staff Trainer training is lacking for many staff officers. Nearly all Command Posts used a video display to monitor the Common Operating Picture, which allowed Officers to recognize changes to the common operating picture in near real time. A majority of Officers (65%) favor the individual Soldier radio.

1. Introduction. The Test and Evaluation Office, Capabilities Development and Integration Directorate, Maneuver Center of Excellence conducts Post-Combat Surveys (PCS) to collect, reduce, analyze, and disseminate Soldier feedback. This report summarizes a PCS conducted on 15 February, 2012 with 116 Officers from the Maneuver Captains Career Course with experience from Iraq and Afghanistan. The report covers broad themes/topics and is not comprehensive of the entire PCS. Users of this report should review the data in the Appendix to ensure their specific information requirements are met.

    a. Purpose. This report provides a summary and analysis of Soldier opinions on systems, equipment, training, and other experiences from their deployment. The PCS report provides combat developers, material developers, and other DoD organizations with Soldier feedback on current systems, equipment, and other operationally significant areas to improve support to the field and inform future modernization efforts.

    b. Methodology. The PCS contains Likert scale queries, single and multi-select/multiple choice, yes/no, and open-ended questions. Data was compiled and recorded as both total counts and percentages. Open-ended responses were analyzed for relevance, grouped by theme, and reported based on frequency. Soldiers completed the survey on individual laptop computers in a classroom environment utilizing commercial survey software. Multiple agencies and organizations provided study issues/questions that were further refined for inclusion in the survey. Soldiers were asked to rate the effectiveness or importance of systems. Because some questions allowed for multiple responses and percentages are rounded to the nearest whole number, the total counts will not always add up to 100%.

    c. Constraints and Limitations. Soldier responses are based on their experiences in a particular environment, their specific missions, and their willingness to share information. The survey directed the respondent to only answer questions or make comments on questions and statements they had personal knowledge or experience with during their deployment. Analysis of Soldier comments is based upon the number of individuals who chose to provide additional information and is not based upon the total number of Soldiers surveyed. This information is intended to supplement additional research data and provide support to the reader or decision maker; it is not the final analysis or assessment of the overall effectiveness of any system. Unit designations are not included in the report or data to ensure anonymity.

    d. Point of Contact. Please direct all recommendations for survey improvements, potential study issues/questions, and other inquiries to Rick Heaton, Test and Evaluation Office, at richard.a.heaton6.civ@mail.mil or (706) 545-4194.

2. Demographics

   a. **Overview.** 116 Officers participated in this survey.
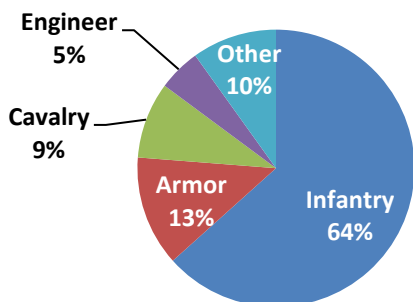
Figure 1 – Branch
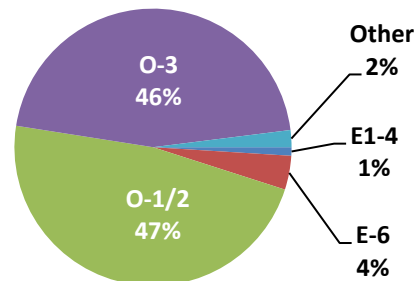
Figure 2 – Grade While Deployed

   b. **Area of Operations (AO).** 48 Officers (41%) deployed to Iraq for Operation Iraqi Freedom/Operation New Dawn (Iraq) and 65 (56%) deployed to Operation Enduring Freedom (Afghanistan). Most Officers deployed to Iraq operated in Baghdad, Diyala, or Anbar. Most Officers deployed to Afghanistan operated in Kandahar. The following chart (Figure 3) describes the primary terrain environment these Officers operated in.
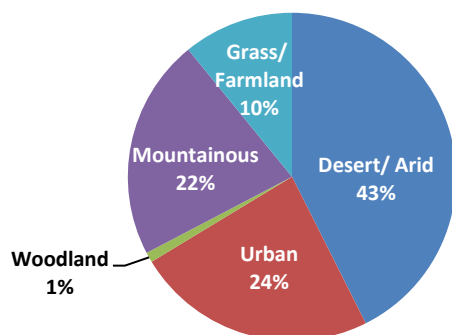
Figure 3 – Operational Environment

   c. **Operations.** 55 Officers (47%) engaged enemy targets with a direct fire weapon and 57 Officers (49%) supervised the employment of direct fire weapons against enemy targets. More than half stated their initial engagement range was 400 meters or less during daylight (58%) and 100 meters or less during limited visibility (57%) . 106 Officers had experience with vehicles while deployed, 49% with Up-Armored HMMWVs and 85% with MRAPs. Officers were surveyed on how often their unit or subordinate units conducted independent, squad operations (Figure 4).

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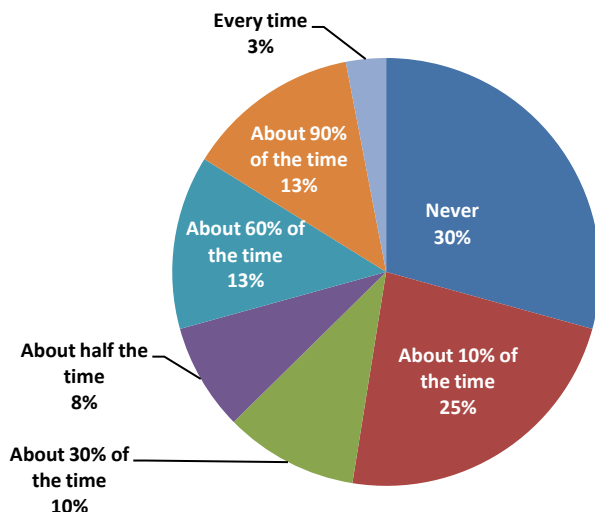
Figure 4 – Frequency of Independent Squad Operations

3. Small Unit Operations. 115 Officers were surveyed on small unit operations.

    a. Platoon Detection and Identification Capabilities. Leaders were asked the distance a dismounted squad should be able to both detect and positively identify (friendly, hostile, non-combatant) a dismounted individual or a vehicle. The majority stated an individual should be detected at 800 meters or less (56%) and positively identified at 800 meters or less (67%). A vehicle should be detected at 3500 meters or less (68%) and positively identified at less than 2500 meters (69%).

    b. Platoon Capabilities Against Dismounted Threats. Leaders were asked the maximum effective range a dismounted platoon should be capable of engaging a dismounted threat using both internal weapons (M240B, M249, M203/320, AT-4, etc) and external weapons (CAS, Indirect Fire, Attack Aviation).

	Up to 300 meters	300 to 500 meters	500 to 800 meters	800 to 1000 meters	1000 to 1500 meters	1500 to 2000 meters	2000 to 2500 meters	More than 2500 meters
Internal Weapon Systems	0%	5%	25%	37%	21%	11%	1%	0%
External Weapon Systems	0%	0%	1%	3%	10%	17%	17%	51%
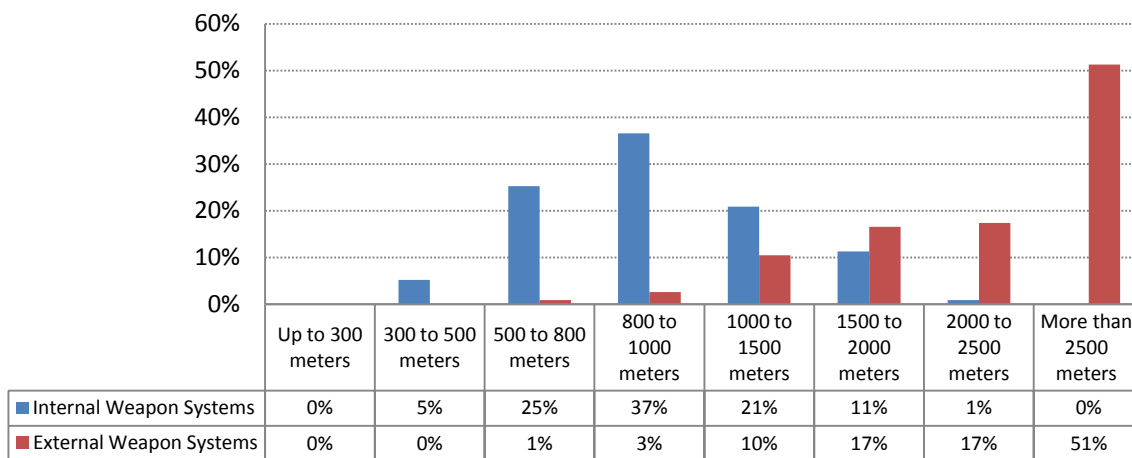
Figure 5 – Required Platoon Capability vs. Dismounted Threat

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c. **Platoon Capabilities Against Mounted Threats.** Leaders were asked the maximum effective range a dismounted platoon should be capable of engaging a mounted threat using both internal weapons (M240B, M249, M203/320, AT-4, etc) and external weapons (CAS, Indirect Fire, Attack Aviation).

	Up to 300 meters	300 to 500 meters	500 to 800 meters	800 to 1000 meters	1000 to 1500 meters	1500 to 2000 meters	2000 to 2500 meters	More than 2500 meters
Internal Weapon Systems	0%	3%	9%	21%	27%	20%	14%	6%
External Weapon Systems	0%	0%	3%	0%	4%	11%	11%	68%
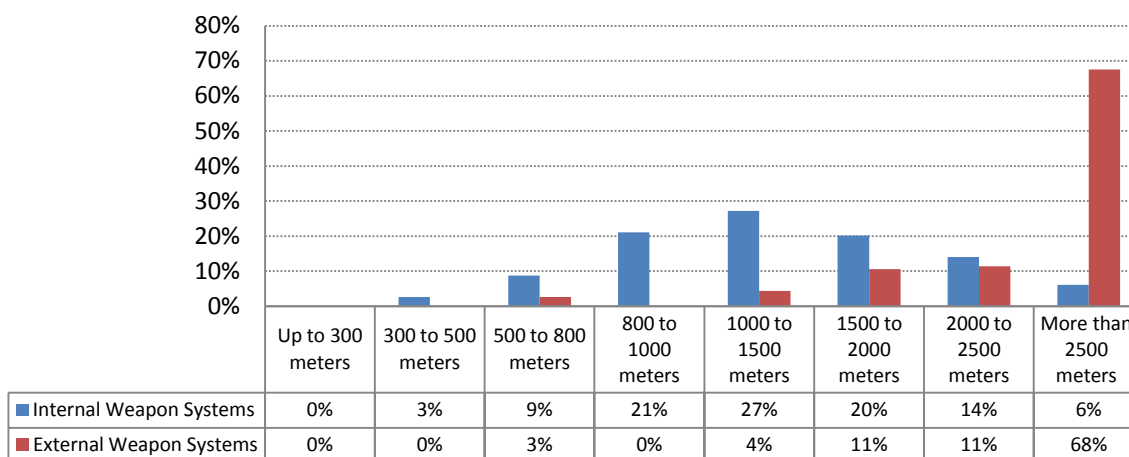
Figure 6 – Required Platoon Capability vs. Mounted Threat

d. **Platoon Effectiveness.** Leaders rated the overall effectiveness of a platoon using internal and external weapon systems.

Internal Weapon Systems
External Weapon Systems

	Internal	External
Very Effective (Overmatches and easily defeats the threat)	35%	67%
Effective (Has the ability to defeat the threat)	63%	31%
Ineffective (Has limited effects to defeat the threat)	3%	2%
Very Ineffective (Effects rarely achieved and unable to defeat threat)		
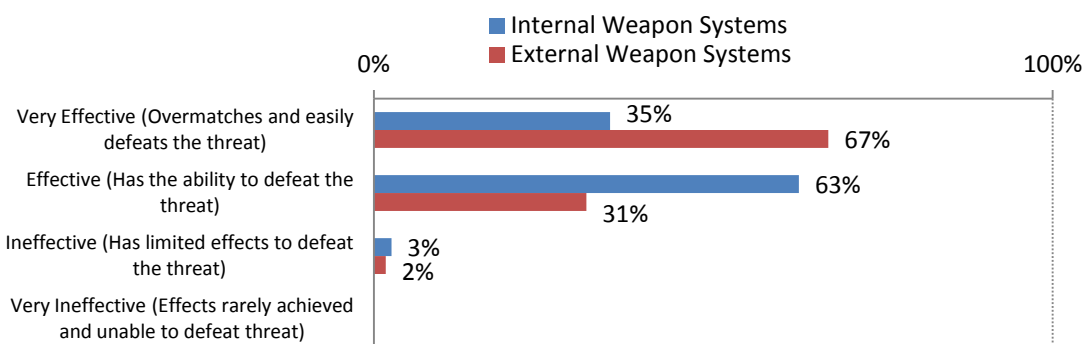
Figure 7 – Effectiveness of Platoon Weapon Systems

e. **Situational Awareness.** Most Leaders (85%) stated their small units effectively maintained situational awareness while operating decentralized and across wide areas. However, only 12% stated it was easy to distinguish hostile forces from the civilian population.

f. **Army Training**. Of 116 Officers, 89% are confident in their ability to navigate in complex urban terrain using traditional navigational tools and techniques. 65% stated they do not consider the current physical fitness training program sufficient in preparing Soldiers to execute missions in all operational environments. 61% consider the Army's communication training has properly prepared them to send and receive voice and data on mission command systems. 77% believe the Army does not properly train platoons to conduct defensive operations. 24% conducted formal training on humanitarian assistance operations prior to deployment and 7% conducted training while in-theater. 49% reported receiving Information Operations (IO) training prior to deployment and 25% stated they received it while in-theater.

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g. Critical Soldier, Leader, and Platoon Capabilities. Leaders were asked to rank-order the top five tasks for a Soldier within a platoon (Figure 13), a Leader within a platoon (Figure 14), and the capabilities a platoon should have (Figure 15) in order to survive combat operations.

1. Acquire & engage targets during heavy physical exertion
2. Maintain physical stamina for 72 hrs of continuous operations
3. Send and receive communications during physical exertion
4. Conduct Individual Movement Techniques (IMT) in full combat gear for 300 meters
5. Walk 10km wearing full combat gear under extreme

Figure 8 – Top Five Rank-Ordered Soldier Tasks

1. Conduct Basic Army Battle Drills

2. Understand how to plan at the small tactical level by including civil considerations
3. Understand route planning and be able to maintain threat interdiction along a route to target
4. Conduct Surveillance and Reconnaissance

5. Understand the difference between doctrinally correct military tasks: (clear, seize, destroy, isolate, secure, etc.)

Figure 9 – Rank-Ordered Leader Tasks

i. Basic Battle Drills

ii. Ability to return direct fire

iii. Platoon communication and control

iv. Platoon live fire training

v. Physical Fitness

Figure 10 – Top Five Rank-Ordered Platoon Capabilities

h. Platoon Communications/Power Requirements. Leaders identified the distances at which a dismounted squad should be capable of sending and receiving both voice and data for both internal (Figure 11) and external (Figure 12) communication.

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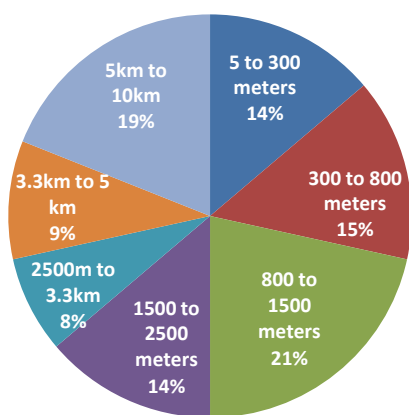
Figure 11 – Squad Internal Communications Range
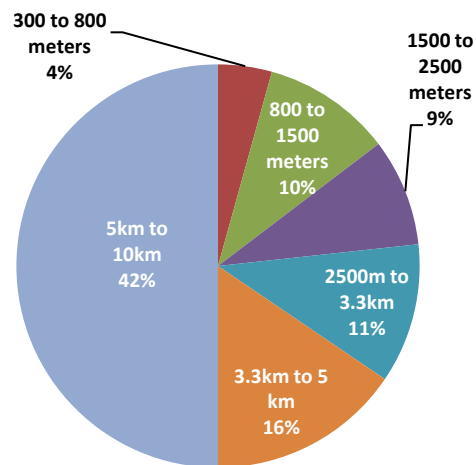
Figure 12 – Squad External Communications Range

They were also asked their opinion on how long a dismounted squad's power supply should last before requiring either recharging or resupply while operating as an independent force (Figure 13) and as part of a larger force (Figure 14).
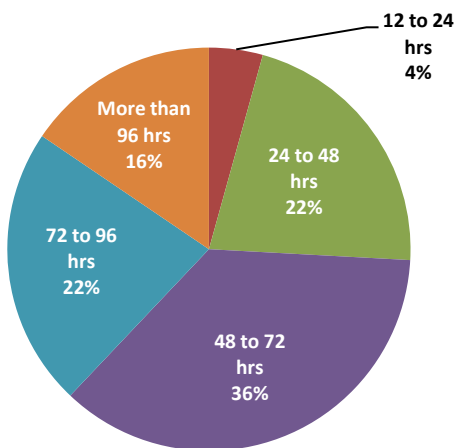
Figure 13 – Duration of Squad's Power Supply Operating Independently
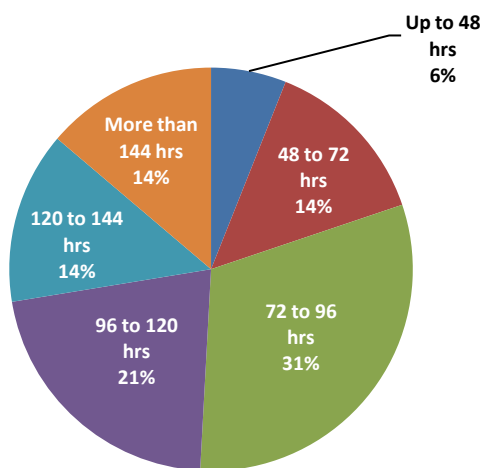
Figure 14 – Duration of Squad's Power Supply Operating as Part of Larger Force

i. Medical Support. 98 Officers (84%) agreed that squads conducting independent missions require a medic to provide critical combat care. 112 Officers (97%) believe every Soldier in a squad should be a trained first responder (combat lifesaver).

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j. Civil Engagements. 100 Officers (86%) reported conducting humanitarian assistance to the local civilians. 112 Officers (97%) agreed it was operationally useful to have the ability to communicate with non-English speaking individuals and agencies. The most frequently used tools to facilitate communications with civilians during deployment were foreign national interpreters, smart books, cultural and language training prior to deployment, and US interpreters.

k. Leader Comments. The majority of comments regarding physical fitness recommended training focus on the battlefield tasks a Soldier would face, emphasizing strength and endurance training. Communication training recommendations included increasing the time/quality of instruction and training with equipment currently being used in theater. Platoon defensive training recommendations were to incorporate live-fire/field training exercises and focus on defensive doctrine. Maintaining situational awareness, leveraging technological advantages, and robust intelligence gathering efforts were the best means of identifying or avoiding IEDs. Improving a small unit's capability requires upgrading the equipment/weapons used, improving the squad medical support capability, focus on marksmanship, and better use of external assets. Officers also recommended more focus on information operations and civil affairs/humanitarian assistance training.

l. Summation. Officers are confident in both internal/external weapon systems to defeat enemy threat, but external assets are perceived as more effective. Most Soldiers are not properly trained to conduct defensive operations. More training is needed on defensive operations, especially for units conducting sustainment efforts. Basic battle drills are the most essential platoon capability and the ability to lead battle drills is the top Leader requirement. The physical strength and endurance of Soldiers to meet the challenges of battle is a very high concern for Leaders. Leaders believe a platoon's capability against a target should match the distance positive identification can be made. There are no easy or reliable means of positively identifying enemy forces mixed with civilian populace. Leaders recognize the need and utility of more cultural awareness and civil affairs training.

4. Combat Engagements

a. Direct Fire. 47 Officers were surveyed on their direct-fire combat engagements. 91% reported the enemy initiated an engagement more often than friendly units. The majority of daylight engagements were initiated between 300 and 400 meters, while the majority of night engagements were initiated at 100 meters or less. 86% stated at least half their direct fire engagements were during daylight hours.
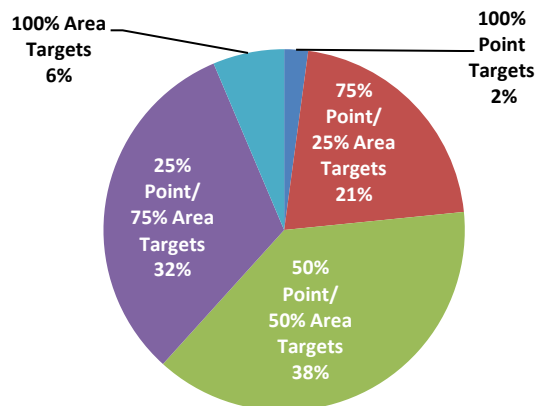
Figure 15 – Target Type
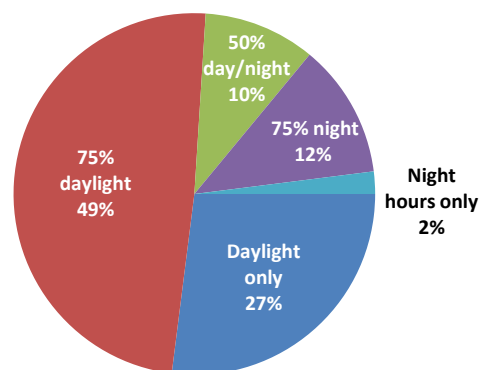
Figure 16 – Day/Night Ratio

b. Reaction to Direct Fire. 72% of Officers stated they were able to reach a covered position in a timely manner when engaged by direct fire. Others stated they were unable to reach cover due to the hindrance of their fighting load (7%) or lack of available cover (5%). 27 stated they used obscurants (smoke) during an engagement, with 81% stating they were able to employ them effectively.

c. Weapons and Munitions Effectiveness. Officers rated the most effective systems for forcing the enemy to disengage as close air support – rotary (83%) and heavy machine guns (44%). The least effective systems are individual small arms (80%) and light machine guns (36%). 18 Officers (38%) stated the enemy was able to achieve a tactical advantage over their unit in some of their direct fire engagements. Most stated the enemy achieved a tactical advantage by superior knowledge of terrain or urban infrastructure, with some saying it was due to surprise/ambush and use of IEDs. 18 Officers (38%) reported expending their ammunition basic load at some point during combat operations.

d. Fire Support. 47 Officers were questioned on the length of time it took for fire support to arrive (Figure 17) and the average initial range to the target (Figure 18).

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Fire Support Response Time by Type

	Less than 5 Minutes	5 to 10 Minutes	10 to 20 Minutes	20 to 30 Minutes	More than 30 Minutes	Never Received/ Request Denied
■ Army CAS (46 Respondents)	4%	28%	30%	26%	9%	2%
■ TAC AIR CAS (29 Respondents)	3%	24%	24%	21%	28%	0%
■ Company Mortars (24 Respondents)	58%	33%	8%	0%	0%	0%
■ Battalion Mortars (19 Respondents)	32%	16%	26%	5%	16%	5%
■ Artillery (23 Respondents)	22%	44%	13%	13%	9%	0%
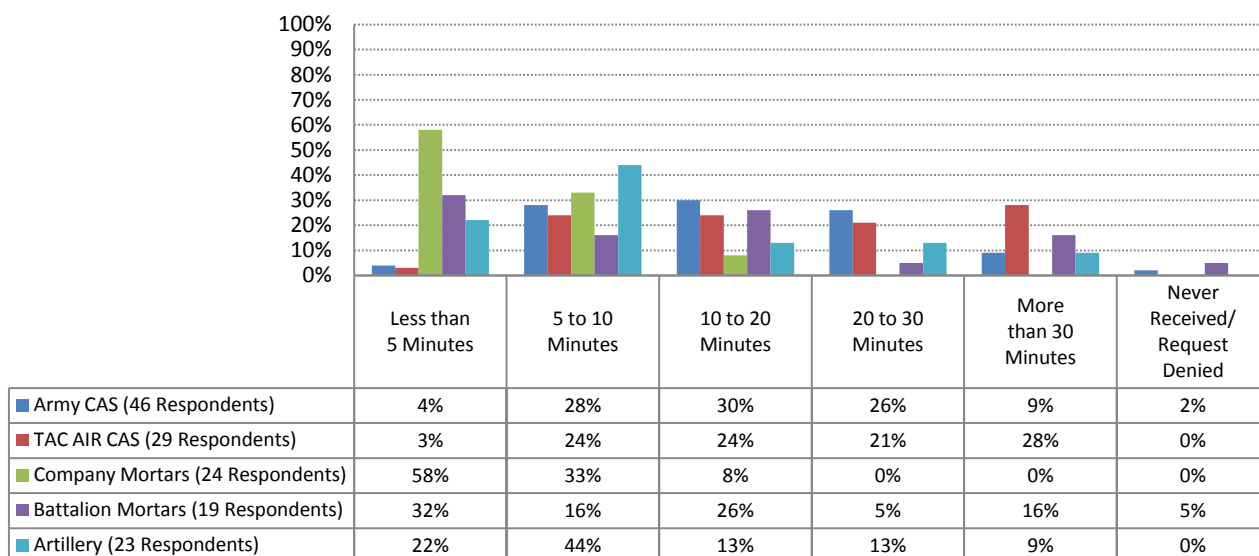
Figure 17 – Fire Support Response Time

Average Initial Range to Target

	300 to 1200 meters	1200 to 2400 meters	2400 to 3600 meters	3600 to 4800 meters	4800 to 6000 meters	More than 6000 meters
■ Mortars/Artillery	32%	24%	13%	21%	5%	5%
■ CAS Rotary/Fixed	46%	24%	12%	10%	5%	2%
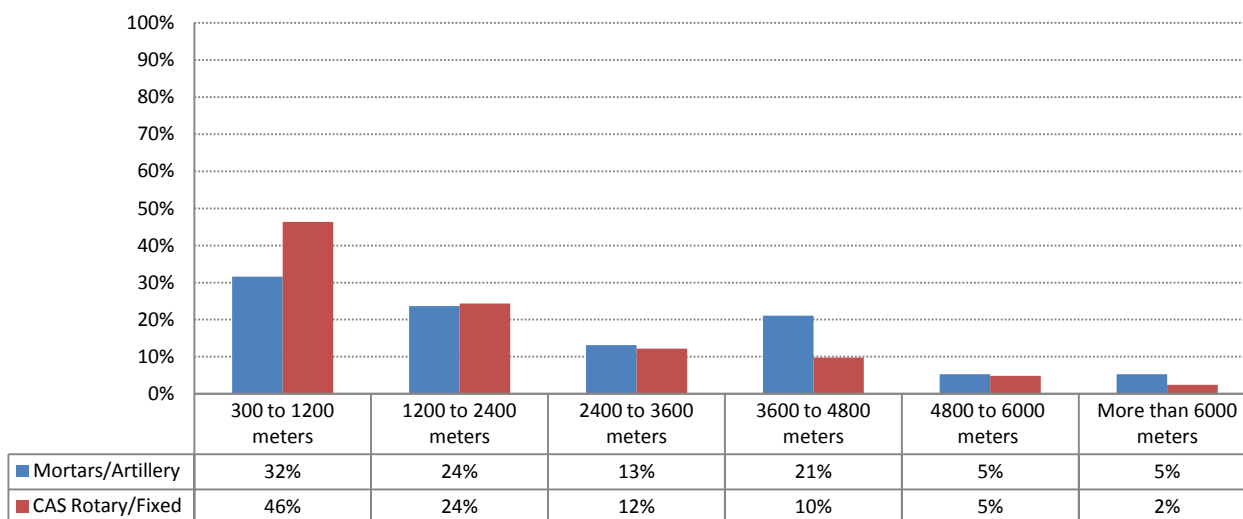
Figure 18 – Target Range

e. **Soldier Comments.** The most frequently mentioned reasons units were unable to maximize their effectiveness during direct fire engagements were the Rules of Engagement (ROE), restricted terrain, and the weight/bulk of the Soldier's load. Proper route selection and vigilance were the most common tactics used to prevent or reduce the effectiveness of enemy ambushes.

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f. Summation. Nearly all engagements were initiated by the enemy, most occurring between 300 to 400m range during daylight hours. Company mortars are considered the most responsive support system due to speed of clearance of fires. Close Air Support is considered the most effective system at forcing the enemy to disengage from direct fire engagements. The enemy was able to achieve a tactical advantage by leveraging superior knowledge of the terrain or urban infrastructure.

5. Soldier Weapons

    a. Weapons, Ammunition, and Accessories

Percentage of Soldiers Rating a Weapon System Effective

	M9 Pistol	M4 Carbine	M249 MG	M203 GL	M320 GL	M14 Rifle	M24 Rifle	M107 Rifle	M110 SASS	M240B MG	M240L MG	M2 .50 cal. MG	MK19 GL	M500 Shotgun
% Effective	28%	76%	83%	86%	83%	88%	73%	100%	100%	94%	100%	100%	100%	100%
Num. Respondents	16	51	6	7	6	25	11	6	10	51	5	50	34	5
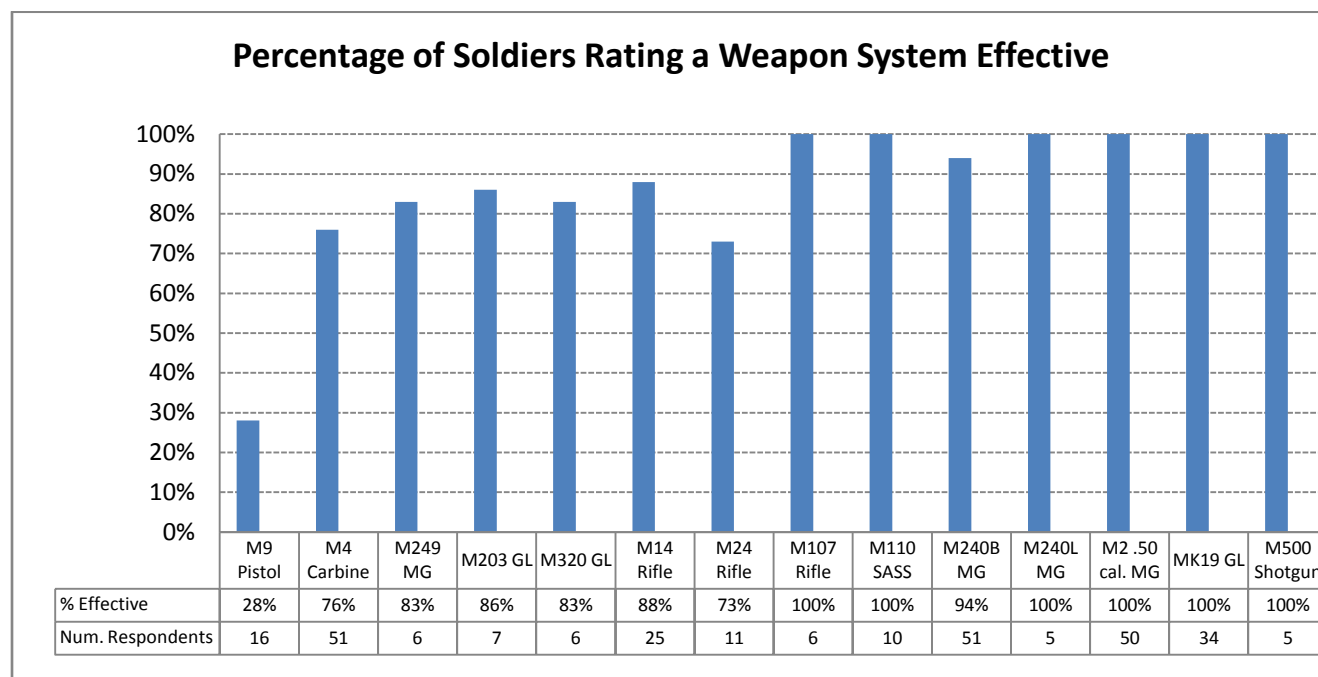
Figure 19 – Weapon Effectiveness

    (1) 9mm Pistol Holster. 14 Officers wore a pistol holster; 10 wore commercial holsters (71%), 3 wore the RFI Modular M9 Holster (21%), and 1 wore the Bianchi 12 (7%). Preferred M9 Holster locations were the chest (57%), thigh (36%), and hip (21%).

    (2) 5.56mm Ammunition. Of 42 Officers using the M855 Ball ammunition, 71% rated it effective in combat. In comparison, of the 16 who used the M855A1 Enhanced Performance Round (EPR), 88% rated it effective. These Officers were asked to rate the characteristics (Figure 19) and performance (Figure 20) of the M855A1 EPR as an improvement over the standard M855 Ball.

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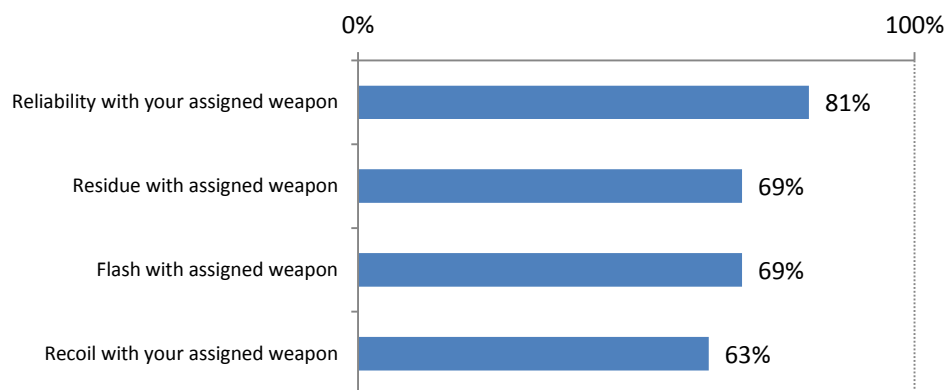
Figure 20 – M855A1 Characteristics
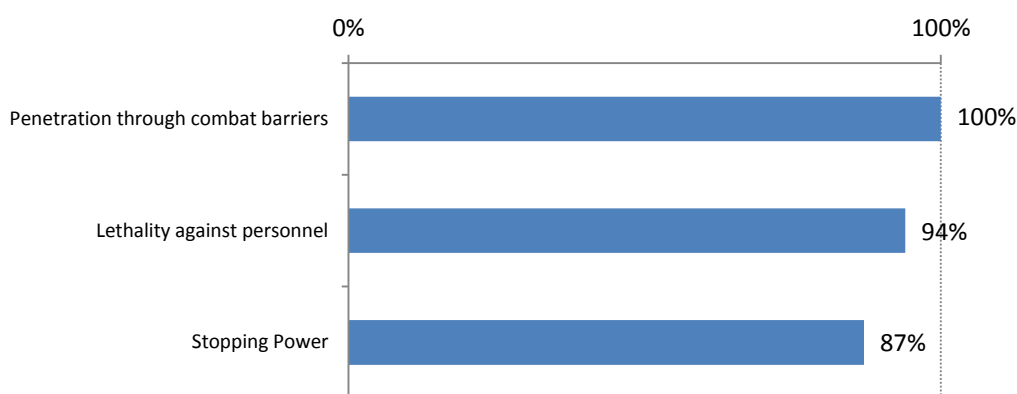
Figure 21 – M855A1 Performance

(3) **Small Arms Weapons Expert (SAWE).** 115 Officers (90%) stated having a school-trained subject matter expert on all technical aspects of small arms, aiming devices, optics, and marksmanship training at the platoon level would have been useful.

(4) **Soldier Comments.** Officers recommended improving the rifle round by increasing the caliber or improving knock-down power. Other recommendations were to reduce the weight of Soldier weapons, increase the number of weapons organic to a unit, and increase marksmanship training.

b. **Hand Delivered Munitions**

(1) **Hand Grenade Safety and Training**. Of the 53 Officers reporting combat experience with the hand grenades, 39 (74%) used the M67 Fragmentation Grenade. 26 Officers (49%) stated they received no training or safety notifications/messages regarding the Confidence Clip and 24% did not receive any hand grenade training with their unit prior to deploying.

(2) **Hand Grenade Employment.** Of 53 respondents, more than half 55% reported employing some modification to their grenades, with the most common being tape on the lever

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arm or the pull ring. Only four Officers (13%) reported being able to throw a hand grenade more than 35 meters while wearing their full fighting load.

(3) White Smoke Grenades. 25 Officers reported using the M8 HC White Smoke grenade and 15 used the M83 TA White Smoke (Figure 22).

Percentage of Soldiers Rating White Smoke Grenades Effective by Characteristic

	Time to Build	Density of Smoke	Duration of Burn
M8 HC White Smoke (25 Respondents)	84%	96%	76%
M83 TA White Smoke (15 Respondents)	80%	87%	67%
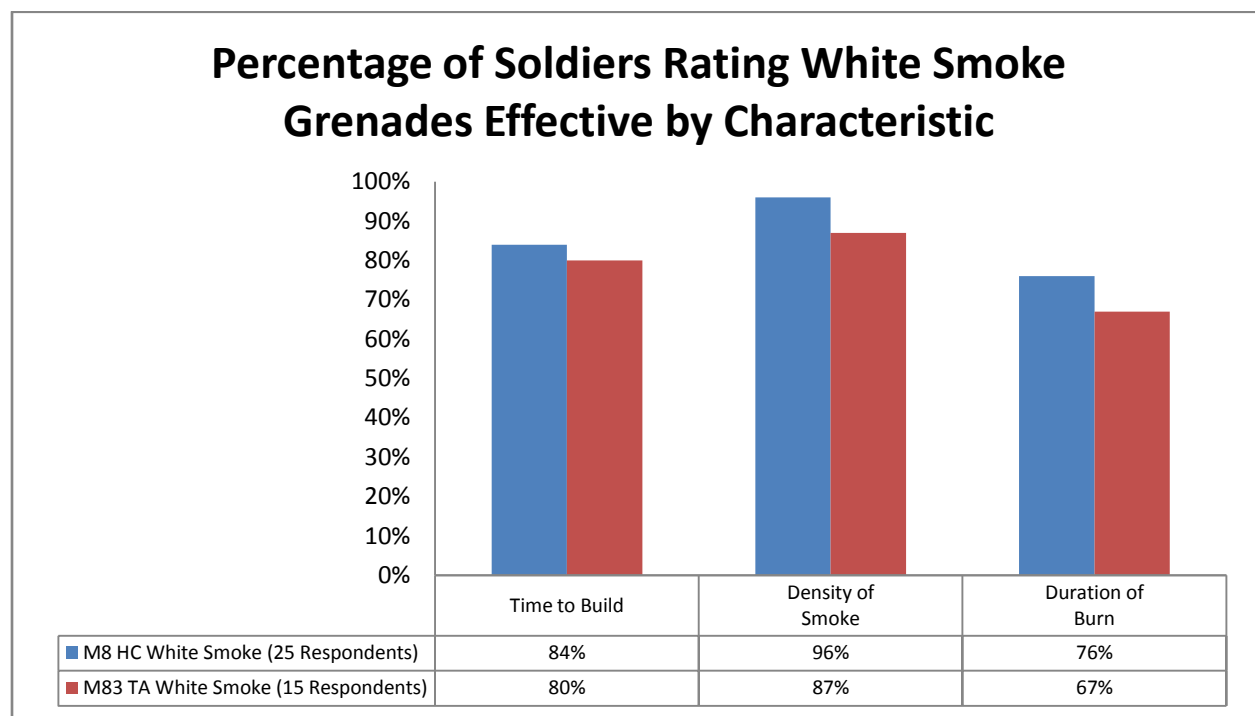
Figure 22 – Effectiveness of White Smoke Grenades

(4) M18 Claymore Mine. 11 Officers reported experience with the Claymore mine. Eight (73%) stated the ROE did not affect their ability to use the Claymore and that they were involved in an engagement where the use of a Claymore mine would have made a difference in their lethality or increased their survivability. Eight Officers (73%) stated their unit trained with the Claymore mine either before or during their deployment and only two (18%) stated their unit encountered difficulty in employing, firing, or recovering an M18 Claymore mine.

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(5) Pyrotechnics

Percentage of Officers Rating Pyrotechnics Effective

	Parachute Flares	Star Clusters	Parachute Smoke	Pen Flare
% Effective	96%	96%	92%	64%
Num. Respondents	49	25	13	11
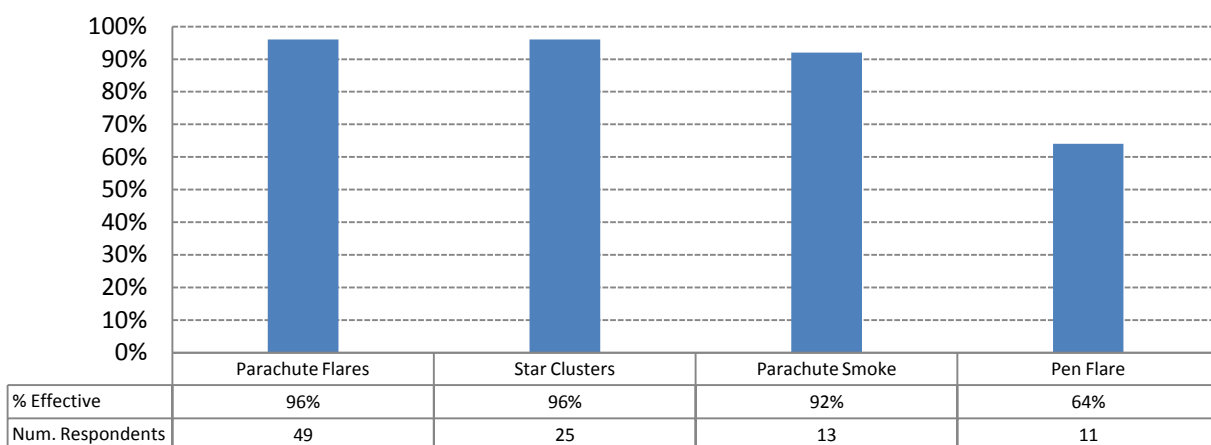
Figure 23 – Pyrotechnics Effectiveness

Pyrotechnic Use by Device

	Parachute Flare	Star Cluster	Parachute Smoke	Pen Flare
■ Signaling	88%	92%	53%	58%
■ Escalation of Force	31%	52%	20%	58%
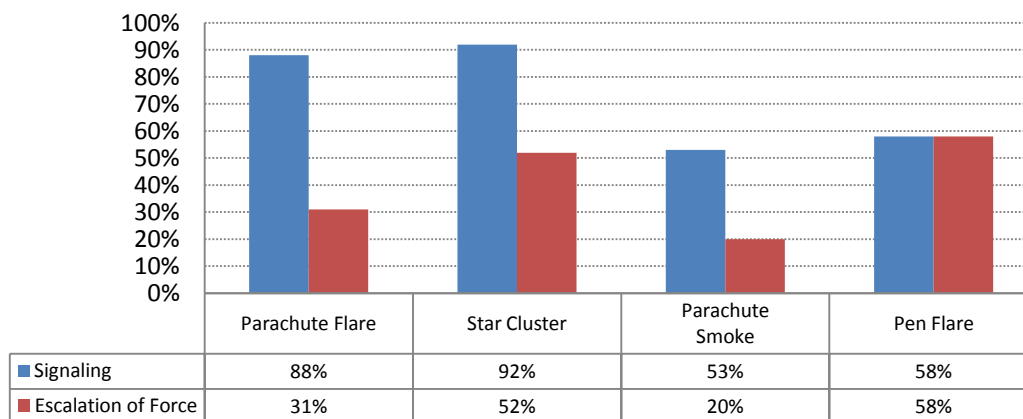
Figure 24 – Pyrotechnic Use

c. Nonlethal Munitions

(1) Nonlethal Employment. 12 Officers reported their unit employed either the 12 gauge blunt trauma round or the M84 stun grenade, 9 used the 40mm sponge grenade, and 6 reported improvising a nonlethal capability. 18 Officers (60%) stated their use of nonlethal munitions was against individuals, with 22 (71%) stating incidents occurring at 50 meters or less. Of 33 Officers surveyed, 22 (67%) stated the ROE hindered their employment of nonlethal capabilities.

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(2) Soldier Comments. The majority of comments focused on increasing nonlethal options, particularly those nonlethal munitions that do not require a separate weapon system or modification to current systems.

d. Shoulder Launched Munitions (SLM). 96 Officers fired or supervised the firing of an SLM during combat operations. 66 (69%) fired the M141 BDM/SMAW-D, 30 (31%) the M136 AT4, 15 (16%) the M72A3/7 LAW, and 13 (14%) the M136A1-AT4CS. 12 reported engaging targets at greater then 300-meters distance. SLM usage slightly more for enemy suppression than target defeat. Of 71 Officers queried, 61% stated they would prefer a single SLM with multi-targeting capability over a smaller and lighter SLM with a single-target type capability. Officers rank-ordered the characteristics of a future SLM from most important to least important.
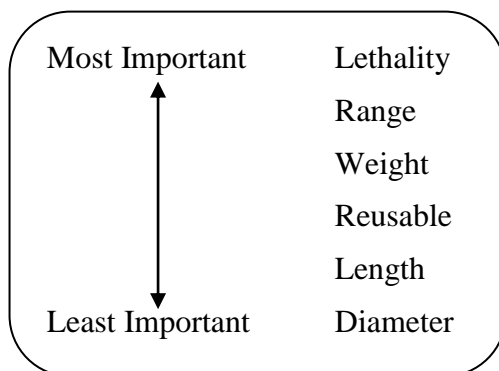
Figure 25 – Future SLM Characteristics

e. TOW/Javelin

(1) TOW. 11 Officers had experience with the TOW. The majority of TOW targets were troops in rock formations, vehicles, and mud/adobe buildings/walls. The TOW was considered effective against all target types. Officers rank-ordered the characteristics to improve for the TOW.
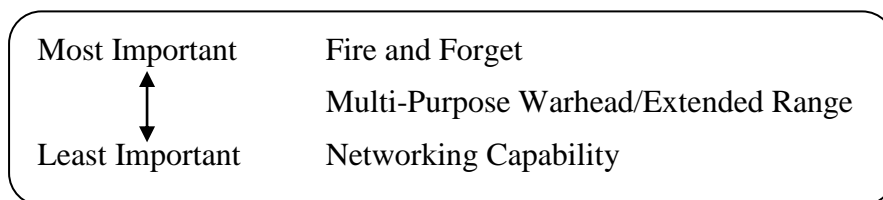
Figure 26 – TOW Improvements

(2) Javelin. 13 Officers had experience with Javelin missiles. Eight stated their unit typically employed the Javelin while dismounted/on-patrol and five used them static in a COP/FOB. The most frequently engaged targets were troops in rock formations, mud/adobe buildings/walls, improved defensive position/bunker and troops in the open. The Javelin was considered effective against all target types. The Officers rank-ordered the characteristics for improvement of the Javelin.

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Most Important   Multi-Purpose Warhead

Extended Range

Reduced Weight/Far Target Locator

Least Important   Networking Capability
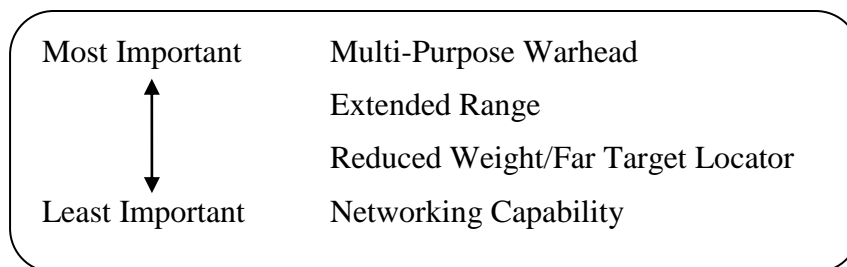
Figure 27 – Javelin Improvements

f. Mortar Systems

(1) Calls for Fire. 39 Officers initiated a call for fires from a mortar system: 74% from 60mm company mortars, 64% from 120mm battalion mortars, and 51% from 81mm mortar systems. Nearly all requesting 60mm (96%), 81mm (89%), or 120mm (97%) mortar fire rated the system effective during combat operations.

(2) Fire Direction. 8 Officers controlled fires as part of a Fire Direction Cell (FDC): 83% directed 120mm battalion mortar fire, 66% 81mm mortar fire, and 50% 60mm company mortars. Of 39 Officers requesting or directing fires, 85% stated fire missions were transmitted via voice communication using map coordinates, polar, shift from known point, or laser range finders to identify target location. 83% reported fires were normally initiated against targets of opportunity and 34% against pre-planned targets.

(3) Soldier Comments. Clearance of fires was seen as overly restrictive. Officers recommended having mortar fire clearance at the company level and artillery at the battalion level. The 60mm mortar was considered the most responsive due to being organic at the company level.

g. Summation. Nearly all weapon systems are considered effective, except the M9 pistol. There is a recognized need for having a school-trained Small Arms Weapons Expert at the platoon level. A small number of Leaders had experience with the new EPR 5.56mm round, with nearly all considering it an improvement over M855 ball ammunition. Platoons require more variety and greater access for organic weapon systems. Lighter, more lethal individual weapon systems are desired. Pyrotechnic signaling remains a critical capability. Units need better nonlethal options to support sustainment operations and deal with local civilian populace. Enemy troops in rock formations are frequently engaged with TOW/Javelin missile systems. Hand Grenade safety messages are not disseminated to the lower leadership level.

6. Soldier Protective and Individual Equipment

a. Body Armor. 101 Officers stated they preferred a modular, scalable body armor system as the most effective means of reducing a Soldier's load; 13 chose using a squad-level Unmanned Ground Vehicle/All-Terrain Vehicle (UGV/ATV) to carry select equipment.

        (1) Improved Outer Tactical Vest (IOTV). Of the 81 Officers who wore the Improved Outer Tactical Vest (IOTV), 78% rated it effective. 33% stated they were measured for their IOTV by having their chest measured, 31% were either asked their uniform coat size or asked what size they preferred, and 5% were issued what was available.

        (2) Soldier Plate Carrier System (SPCS). 54 Officers wore the Soldier Plate Carrier System (SPCS), with 93% rating it effective. Officers stated they were measured for their SPCS by being asked what size they preferred (33%), asked their uniform size (31%), measurement of their chest (30%), or given what was available (6%). 94% agreed the SPCS improved their unit's mobility and agility over the IOTV and 93% stated the reduction in coverage area was an acceptable trade off for increased mobility. Officers rank-ordered possible improvements for the SPCS (Figure 25).

Most Important — Lighter
Tighter/Stronger Strap Hold
Improved Shoulder Padding
More MOLLE Attachments
Less Bulky
Least Important — Stronger Velcro
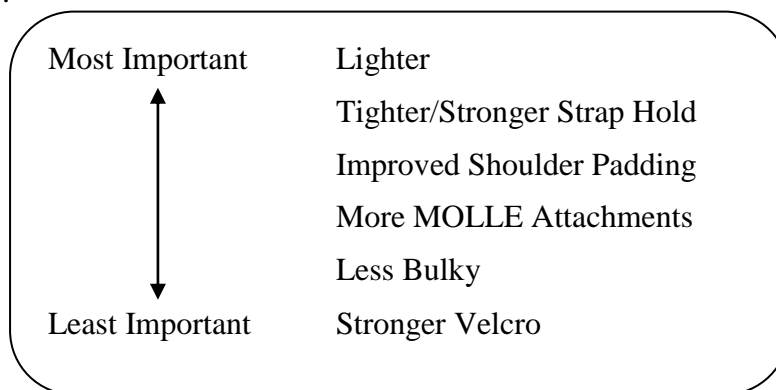
Figure 28 – SPCS Improvements

    b. Advanced Combat Helmet (ACH). 114 Officers reported using the ACH during their deployment. 94% rated the ACH effective overall, with 78% rating the chin strap and 84% rating the internal pads effective. The most common causes of discomfort while wearing the ACH were instability due to attached Night Vision Enhancers (NVEs) (57%), neck strain due to attached NVEs (45%), and the chin strap retention system (35%). 82 Officers reported altering the internal padding of their ACH, either rearranging, removing, or replacing pads. 94 Officers stated they allowed their subordinates to alter the padding in their ACH. Only 24 Officers (21%) reported receiving training or information about the adverse effects of removing/altering the helmet pad configuration.

    c. Combat Uniform. Of 26 Officers who wore the OEF Camouflage Pattern (OCP) uniform, 92% rated it effective. The most common issues encountered with OCP were torn crotches (31%), ripped seams (23%), and fading (19%). Of 62 Officers rating the Army Combat Shirt (ACS), 79% rated it effective. The most frequently reported issues concerning the ACS were ripped seams (60%), fading (40%), and worn Velcro (34%). Of the 43 Officers rating the Extreme Cold Weather Clothing System (ECWCS), 95% found it effective. The most common issues with ECWCS were worn Velcro (19%), stuck zippers (16%), and ripped seams/broken zippers/fading (12%).

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Soldiers Rating of OCP Uniform Concealment by Terrain Type

	Villages	Urban Centers	Grass/ Farmlands	Woodlands	Mountains (Wooded)	Mountains (Dark Rocks)	Mountains (Light Rocks)	Rocky Deserts	Sandy Deserts
% Effective	88%	54%	92%	83%	75%	92%	92%	75%	63%
Num. Respondents	24	18	22	20	18	23	24	19	18
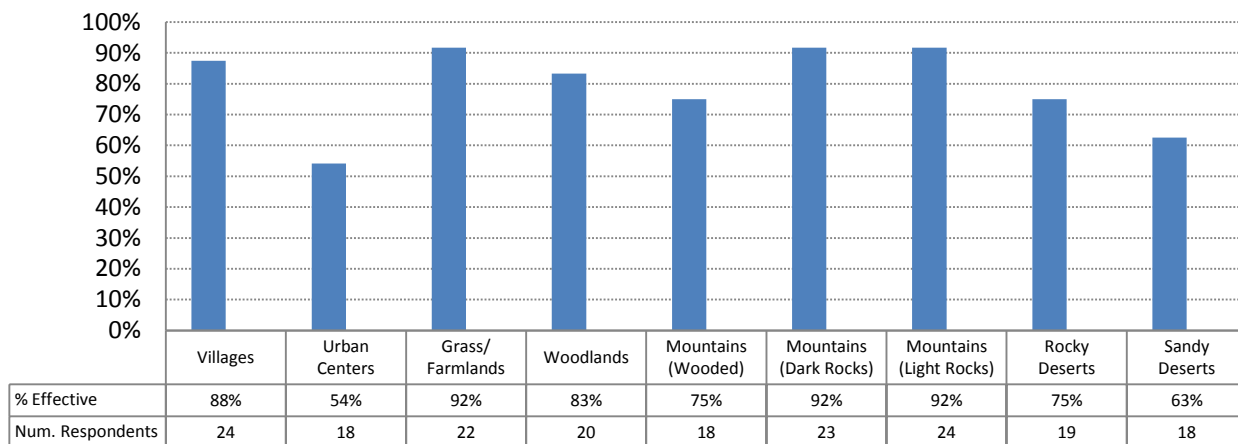
Figure 29 – Uniform Camouflage Effectiveness

d. Gloves

Percentage of Soldiers Rating Gloves Effective by Type

	Aviator Winter	Aviator Summer	Hatch Gloves	Army Combat Gloves
% Effective	85%	79%	100%	76%
Num. Respondents	13	62	17	17
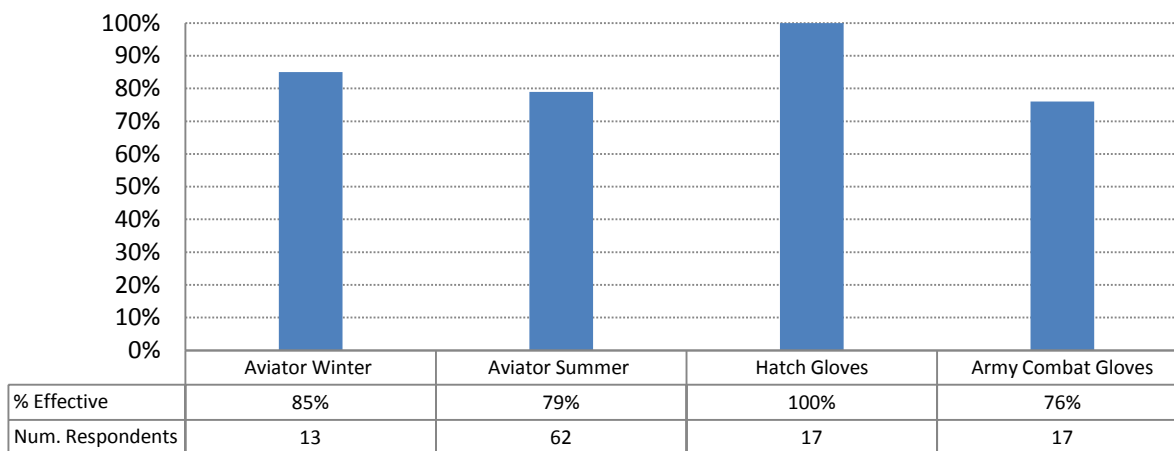
Figure 30 – Glove Effectiveness

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Percentage of Soldier Glove Issues by Type

	Seams tore	Fingertips wore out	Weapon usage	Not weather resistant	Equipment usage
Aviator Winter (13 Respondents)	29%	36%	36%	14%	50%
Aviator Summer (62 Respondents)	56%	70%	14%	37%	29%
Hatch Gloves (17 Respondents)	53%	35%	0%	6%	0%
Army Combat Glove (17 Respondents)	35%	35%	18%	29%	12%
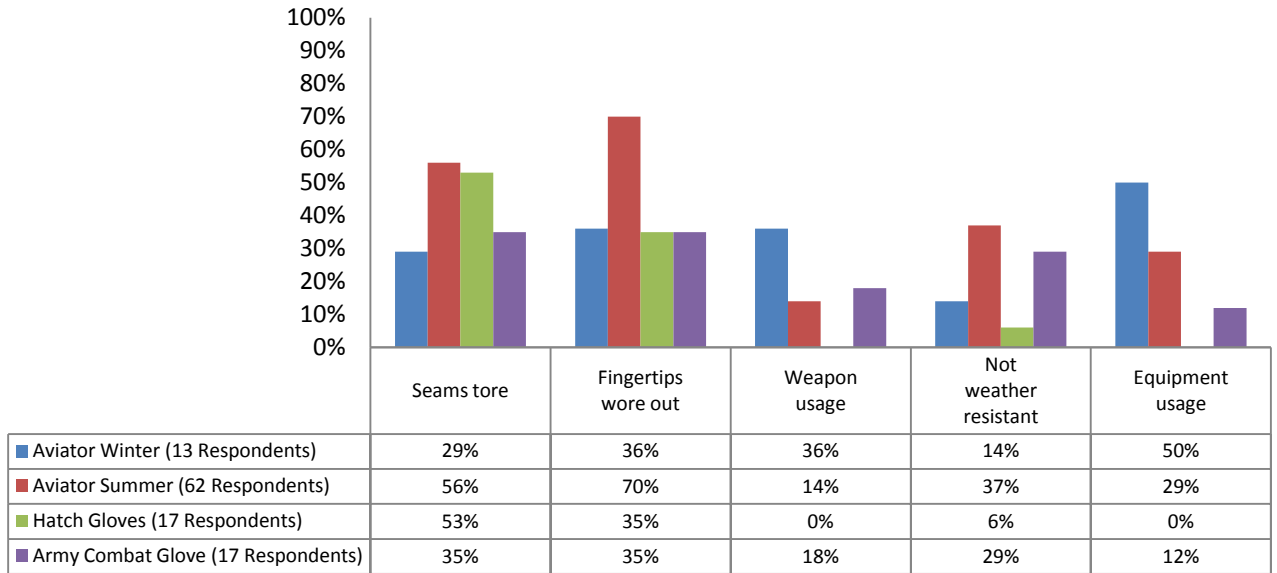
Figure 31 – Glove Issues

   e. Mountain Combat Boots. 114 Officers were queried on whether the Army should provide two types of mountain combat boots for warm and cold weather, with 75% stating yes. 45 Officers wore mountain combat boots: 26 wore Danner 43515X (58% rated effective), 15 wore Belleville 950s (87% rated effective), and 4 wore Wellco (75% rated effective).   The characteristics of a mountain combat boot were rank-ordered by respondents.

Most Important   Comfort

Durability

Traction

Support

Quick Drying

Breathability

Water Resistance

Least Important   Warmth
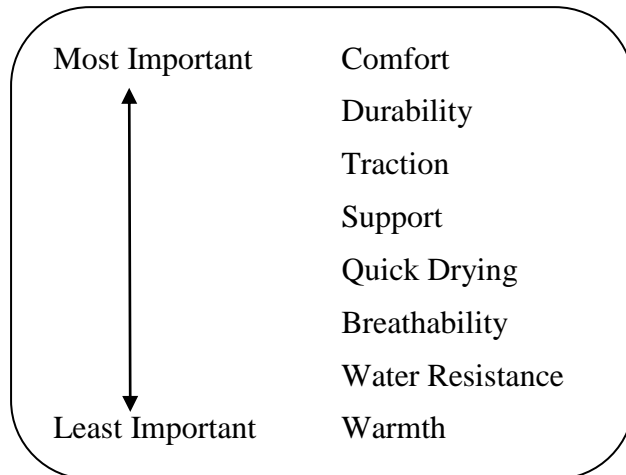
Figure 32 – Ratings of Boot Characteristics

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Percentage of Soldiers Rating Boot Characteristics Effective

	Water Resistance	Warmth	Quick Drying	Traction	Breathability	Durability	Support	Comfort
■ Danner (26)	68%	63%	50%	81%	46%	76%	67%	56%
■ Belleville (15)	87%	93%	73%	93%	73%	87%	93%	79%
■ Wellco (4)	75%	75%	100%	75%	100%	100%	100%	75%
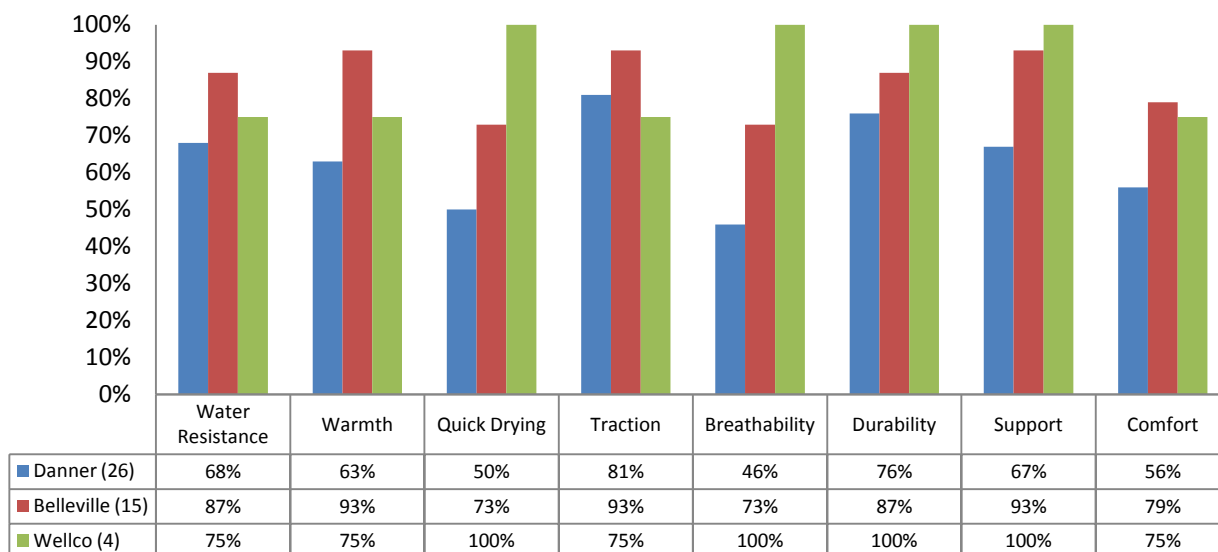
Figure 33 – Ratings of Boot Characteristics

f. Pelvic/Genital Protection. Of 106 Officers surveyed, 31% stated they would prefer a cup with compression shorts configuration for their pelvic/genital protection. 21% stated they would prefer boxers with built-on protection and 11% chose trousers with integrated protection worn under a protective kilt. Given an option, 92 Officers (87%) would prefer a modular, detachable pelvic/genital protection system over a fixed protective system.

Protects the genitals	69%
Quick access for urination (males only)	57%
Protects the femoral artery	55%
Access to cargo pockets	46%
Ease of use	44%
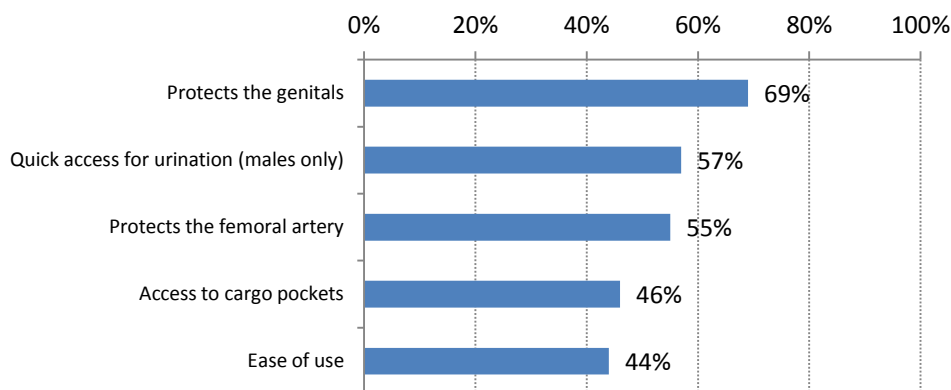
Figure 34 – Top Five Features for Pelvic/Genital Protection

g. Rapid Fielding Initiative (RFI). Officers rank-ordered the best RFI equipment with the top three items being the ACS, Improved First Aid Kit, and multipurpose tool. The three worst items were the knee and elbow pads, ballistic spectacles kit, and goggles.

h. Equipment Issued, Not Used. The most commonly issued equipment not used were the knee and elbow pads, followed by eye protection, IR strobe, issued boots, ECWCS, and goggles.

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Some Soldiers substituted commercially available items because they were not satisfied with the comfort of the equipment. Others stated they had no need for the equipment issued.

    i. Soldier Purchased Items. 100 Officers reported purchasing commercial items for their deployment.

Percentage of Soldiers Purchasing Commercial Items by Type
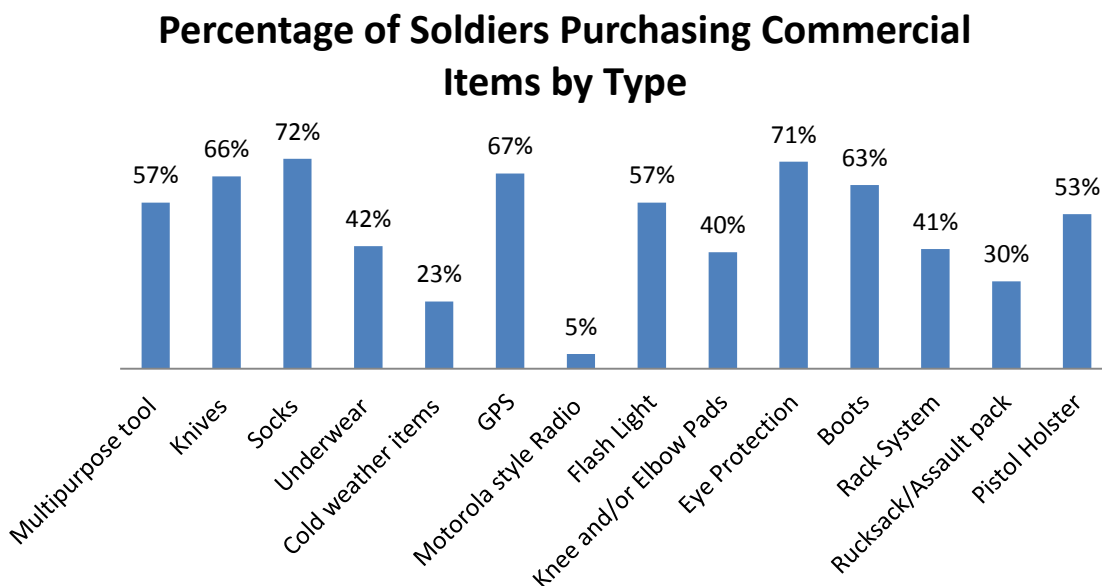
Figure 35 – Soldier Purchased Items
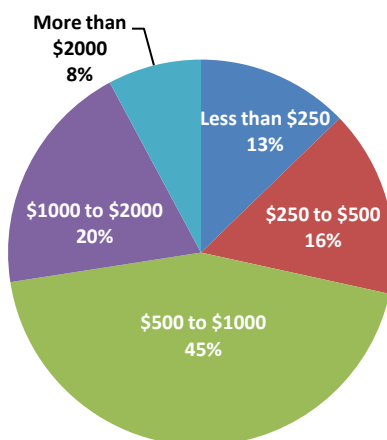
Figure 36 – Percentage of Soldier Spending by Dollar Amount

    j. Soldier Comments. The durability of the combat uniform was the most common criticism of Soldier equipment. Recommendations for improving protective equipment were lighter body armor, improved boots/gloves, and better combat helmets.

    k. Summation. The Soldier Plate Carrier System was considered more effective than the Improved Outer Tactical Vest. The reduced coverage is a risk Leaders find acceptable for

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greater mobility. Leaders do not fully understand the risks associated with altering/removing helmet padding. Wear of the ACH becomes uncomfortable due to instability with mounted night vision enhancers. The OEF Camouflage Pattern uniform is considered an improvement, but durability remains an issue for Soldiers. Comfort and durability of personal equipment are the most frequently cited areas for improvement. The majority of Officers purchased their own commercial GPS for their deployment. Most spent over $500 on commercial equipment.

7. Optics and Sensors

a. Tactical Advantage. Officers were asked if the use of optics and sensors provided a marked advantage over the enemy in target detection, identification, and direct fire engagement. The majority of Officers agreed each system provided some advantage (Figure 31).
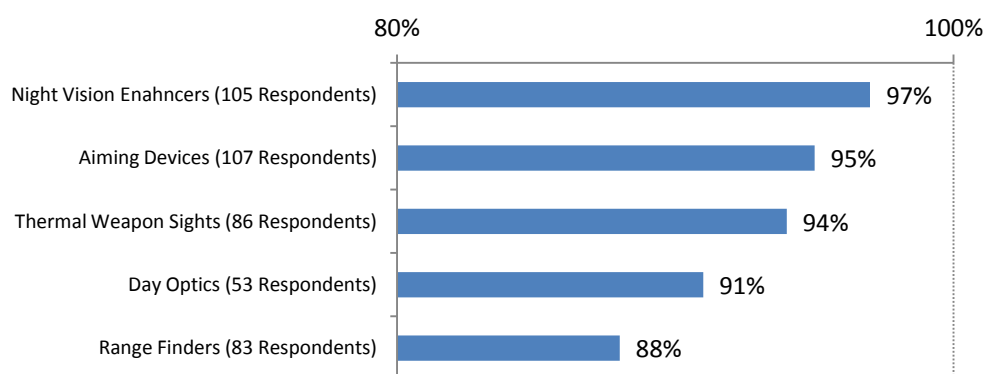
Figure 37 – Tactical Advantage of Optics and Sensors

b. Effectiveness. Officers rated the effectiveness of their optics and lasers (Figure 32), Thermal Weapon Systems (TWS) (Figure 33), and range finders (Figure 34).

Percentage of Soldiers Rating Optics Effective

	M68 CCO	M150 RCO (ACOG)	M145 MGO	Leupold 10X	Leupold 4.5 x 14X	AN/PSQ-23 (STORM)	AN/PEQ-2A	AN/PEQ-15	AN/PEQ-15A	AN/PVS-7D	AN/PVS14	DVE	AN/PSQ-20 (ENVG)
% Effective	51%	98%	85%	90%	60%	87%	74%	97%	90%	51%	92%	82%	86%
Num. Respondents	92	49	20	29	5	39	65	35	10	45	65	34	7
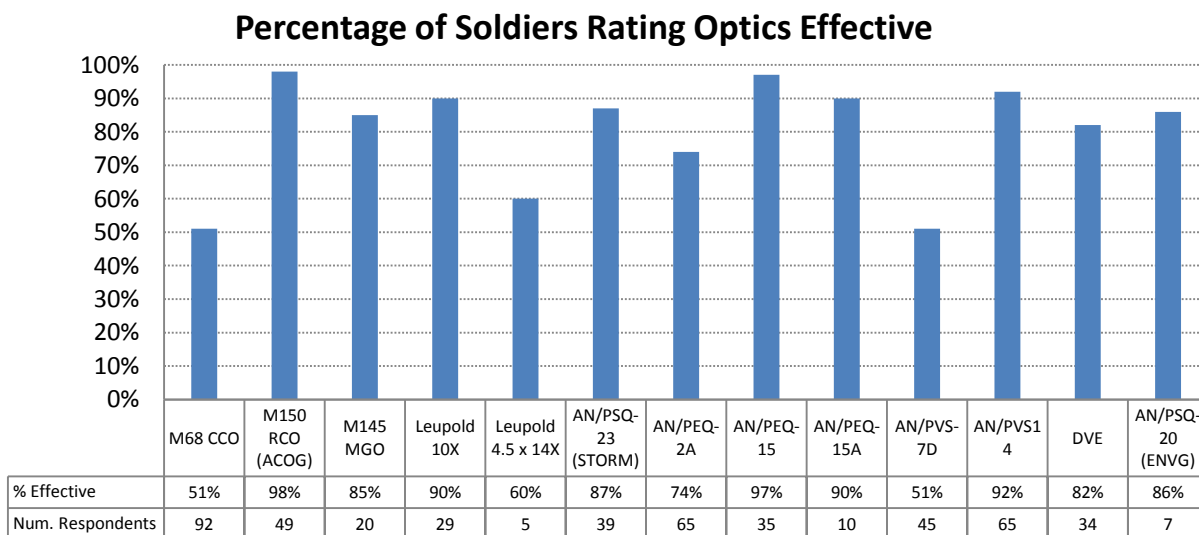
Figure 38 – Effectiveness of Optics

Percentage of Soldiers Rating TWS Effective

	BAE-Light TWS - AN/PAS-13C(V)1	BAE-Medium TWS-AN/PAS-13C(V)2	BAE - Heavy TWS-AN/PAS-13C(V)3	DRS - Light TWS-AN/PAS-13D(V)1	DRS - Medium TWS-AN/PAS-13D(V)2	Raytheon-Light TWS-AN/PAS-13B(V)1	Raytheon-Medium TWS-AN/PAS-13B(V)2	Raytheon-Heavy TWS-AN/PAS-13B(V)3
% Effective	88%	93%	100%	90%	93%	78%	71%	81%
Num. Respondents	40	40	12	10	15	9	14	31
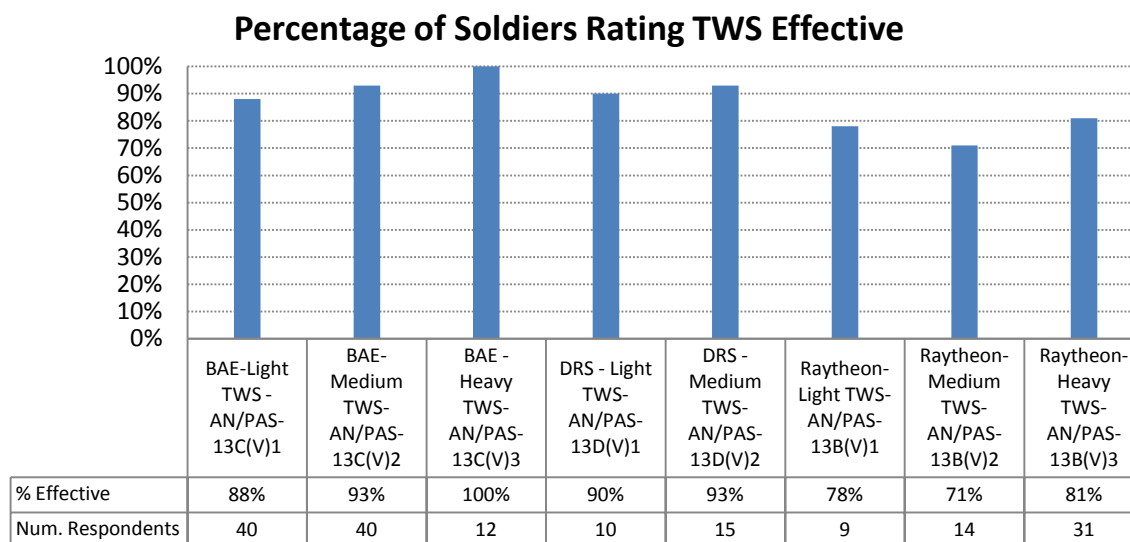
Figure 39 – Effectiveness of TWS

Percentage of Soldiers Rating Range Finders Effective

	Vector 21	Mark VII	MELIOS	LLDR	STORM
% Effective	86%	85%	79%	93%	82%
Num. Respondents	14	13	24	14	39
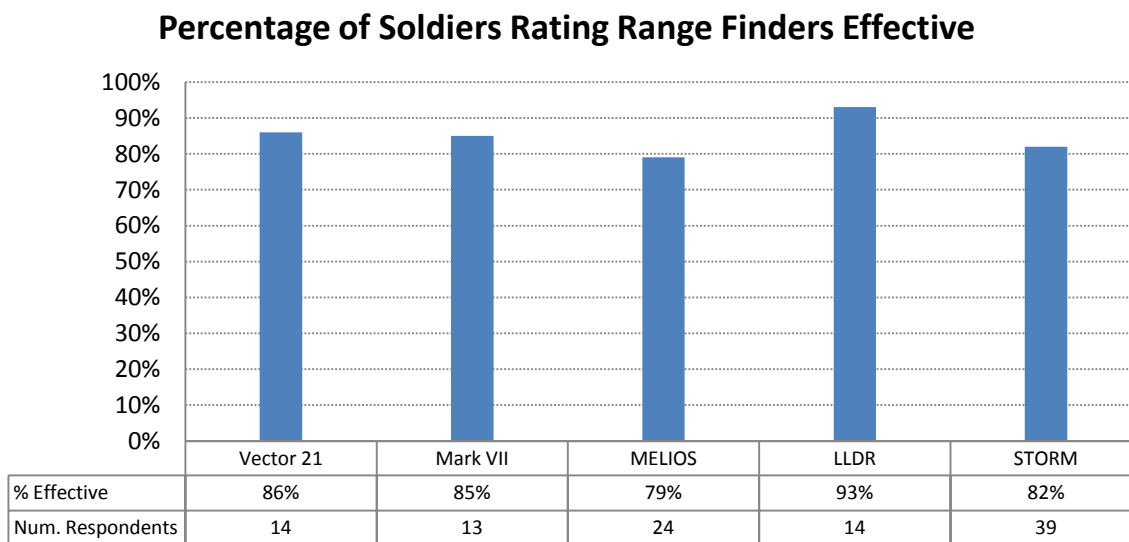
Figure 40 – Effectiveness of Range Finders

    c. Batteries. 105 Officers were surveyed on their battery use with aiming devices: 51% used lithium batteries, 21% used alkaline, and 27% did not know what type they used. 85 Officers were surveyed on their battery use with TWS: 34% reported using lithium batteries, 18% used alkaline, 5% used rechargeable, and 44% did not know what type they used.

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Frequency of Battery Exchange for Aiming Devices

	Less than 2 Hours	2 to 4 Hours	4 to 6 Hours	6 to 8 Hours	More than 8 Hours
AN/PSQ-23 (STORM) (39 Respondents)	5%	18%	37%	18%	21%
AN/PEQ-2A (65 Respondents)	2%	8%	18%	40%	32%
AN/PEQ-15 (35 Respondents)	3%	11%	23%	29%	34%
AN/PEQ-15A (10 Respondents)	0%	11%	11%	56%	22%
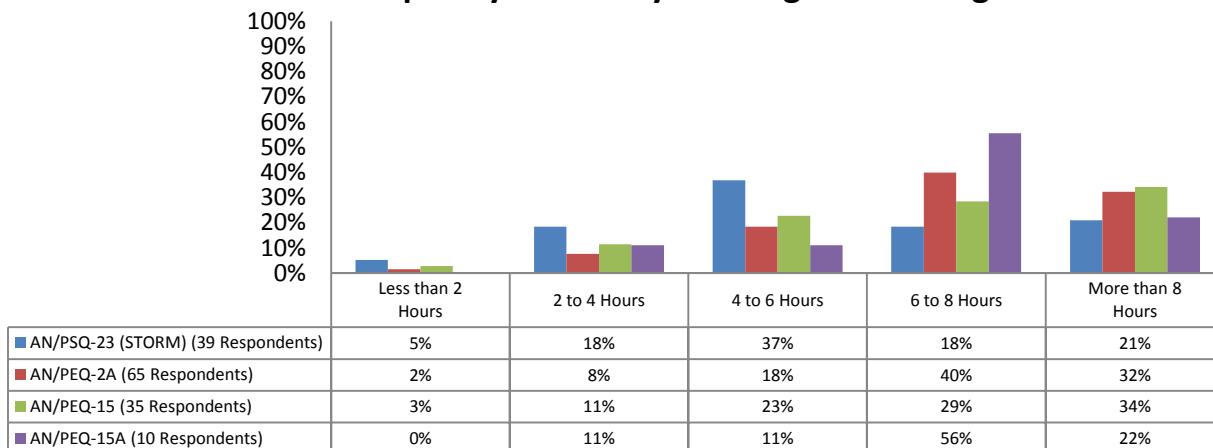
Figure 41 – Aiming Device Battery Life

Frequency of Battery Exchange for TWS

	2 to 4 Hours	4 to 6 Hours	6 to 8 Hours	More than 8 Hours
AN/PAS-13C(V)1 (41 Respondents)	37%	32%	22%	10%
AN/PAS-13C(V)2 (39 Respondents)	36%	26%	31%	8%
AN/PAS-13C(V)3 (11 Respondents)	27%	36%	18%	18%
AN/PAS-13D(V)1 (10 Respondents)	30%	30%	40%	0%
AN/PAW-13D(V)2 (15 Respondents)	47%	27%	27%	0%
AN/PAS-13B(V)1 (8 Respondents)	38%	25%	25%	13%
AN/PAS-13B(V)2 (14 Respondents)	29%	57%	14%	0%
AN/PAS-13B(V)3 (30 Respondents)	27%	43%	27%	3%
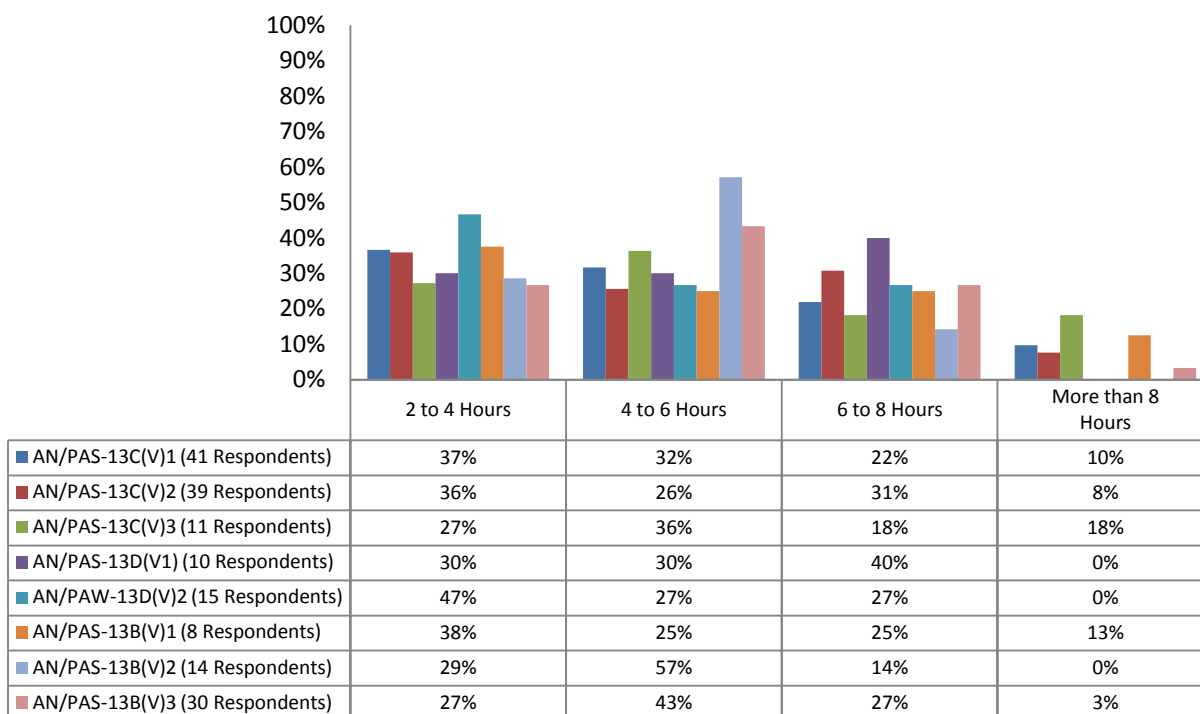
Figure 42 – TWS Battery Life

   d. Soldier Comments. Nearly all Officers stated a variable magnification day sight was needed. The most common performance issues reported with aiming devices were zeroing and bore sight retention. More than half felt a white light integrated with the aiming device would be useful. A strong majority stated they preferred a monocular configuration for NVEs. The most common performance issues reported with range finders were operating during hot conditions and battery life. Most stated they would prefer a lighter handheld laser without optics or far target location capability.

8. Mounted Systems

a. Vehicles. 106 Officers had experience with vehicles while deployed. 79% stated their mounted missions were mostly combat operations (i.e. patrols, humanitarian assistance, information operations, etc) and 14% stated they were mostly sustainment operations (i.e. resupply, MEDEVAC, recovery, etc).
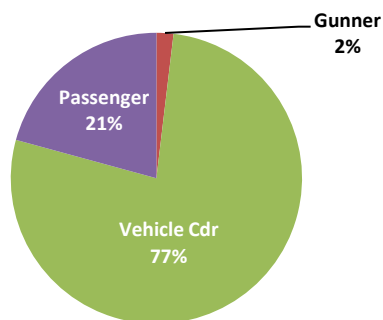
Figure 43 – Vehicle Duty Positions
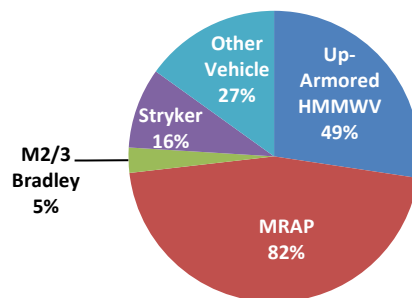
Figure 44 – Vehicles Used
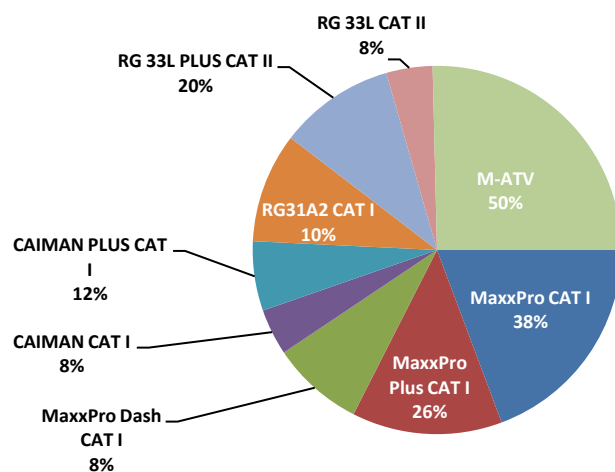
Figure 45 – MRAP Vehicles Used

Percentage of Soldiers Rating a Vehicle Effective

	Up-Armored HMMWV	M2/3 Bradley	Stryker	MaxxPro CAT I	MaxxPro Plus CAT I	MaxxPro Dash CAT I	Caiman CAT I	Caiman Plus CAT I	RG31A2 CAT I	RG33L Plus CAT II	RG33L Plus II	M-ATV
% Effective	66%	100%	83%	54%	42%	87%	100%	55%	71%	68%	100%	89%
Num. Respondents	56	6	18	35	24	15	7	11	17	19	7	46
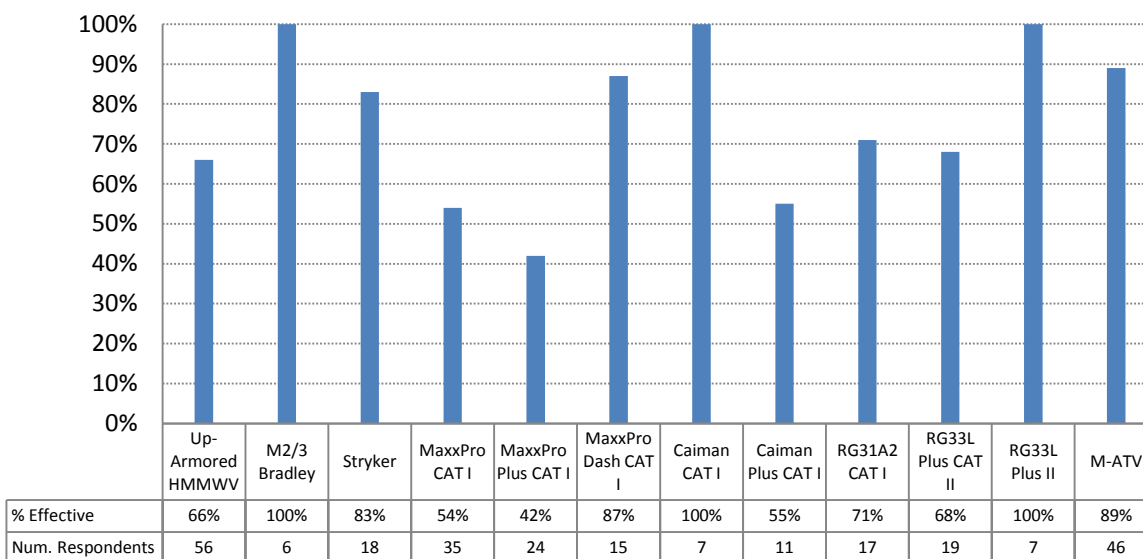
Figure 46 – Vehicle Effectiveness

b. Protection Equipment. 43 Officers had vehicles equipped with an RPG protection kit. Although 72% found the RPG kit interfered or degraded the performance of their vehicle, 67% rated them effective. 18 stated their vehicles were equipped with Explosively Formed Penetrator (EFP) protection kits. 65% stated the EFP protection kit interfered or degraded the performance of their vehicle.

Percentage of Soldiers Rating the Objective Gunners Protective Kit (OGPK) Effective by Vehicle

	MaxxPro Plus CAT I	MaxxPro Dash CAT I	M-ATV
% Effective	71%	55%	52%
Num. Respondents	14	24	33
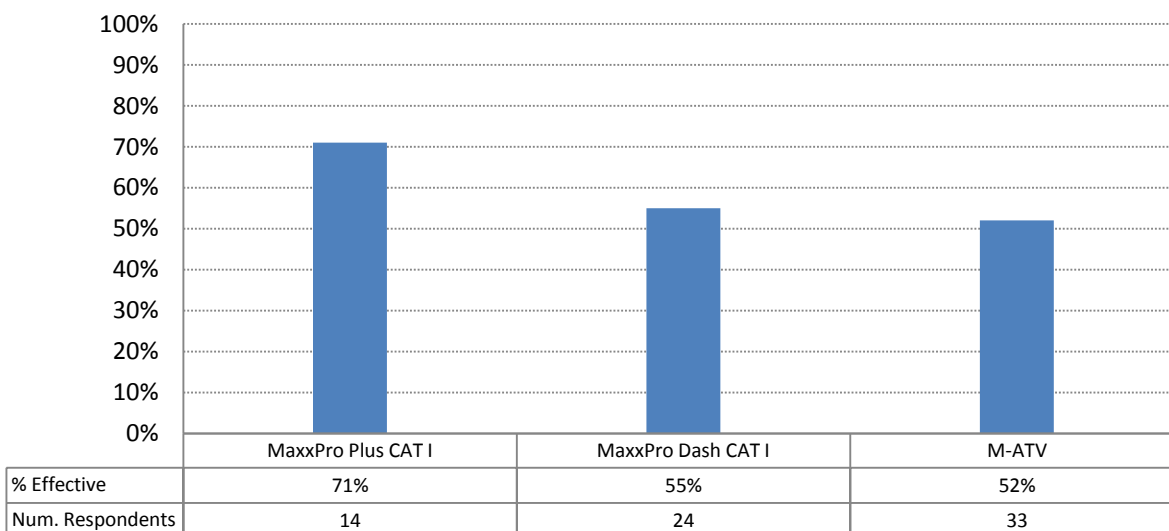
Figure 47 – OGPK Effectiveness

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c. **Mobility Challenges**. Leaders were queried on the mobility challenges they encountered during their deployment, for both combat (Figure 40) and sustainment (Figure 41) operations.

0%   100%

Narrow Passages/Roads	51%
Insufficient Off-Road Capability	19%
Vehicle Top Heavy	10%
Stuck in snow/mud/sand	10%
Gap Crossing	5%
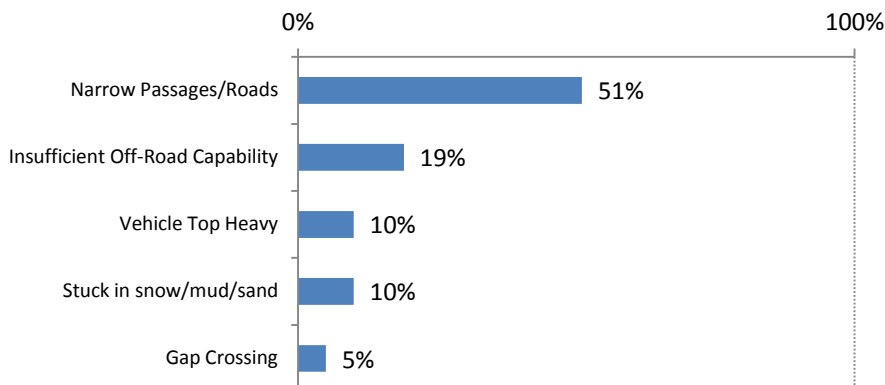
Figure 48 – Top Five Mobility Challenges for Combat Operations

0%   100%

Effect of Terrain on Mobility	40%
Not Enough Vehicles for Missions	20%
Lack of Maintenance and Availability of Parts	13%
Not Enough Payload Space	13%
Other	13%
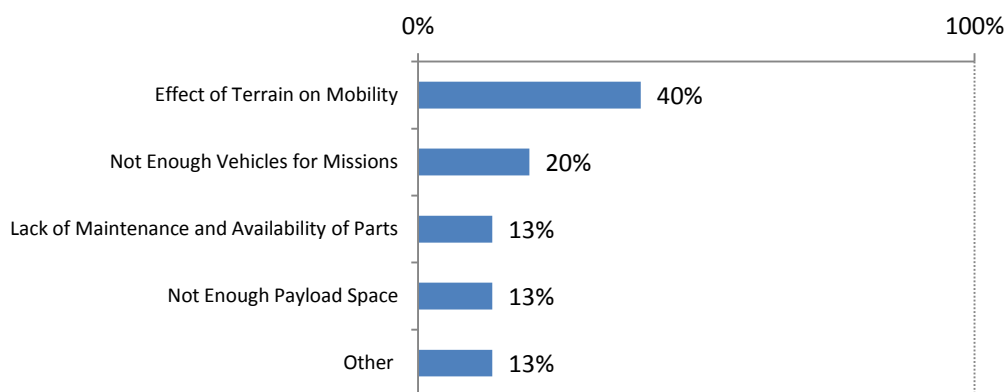
Figure 49 – Top Five Mobility Challenges for Sustainment Operations

d. **Vehicle Weapons**. 44 Officers engaged enemy targets with a vehicle mounted weapon, 95% used the M2 .50 cal, 77% used an M240 MG (either mounted or coax), and 66% used the MK19 GL.   60 Officers with MRAP experience (63%) stated they should be equipped with a missile system.

e. **Additional Vehicle Capabilities.** Recommended additional capabilities included self-recovery equipment (54%), tow bars/chains (47%), increased troop space (41%), and increased stowage space (36%). Other capabilities recommended included thermal imagery (31%), IR headlights (31%), and remote weapon stations (25%). Of 112 Officers, 57 (51%) stated each team should be mounted in a single vehicle, while 55 (49%) stated the entire squad should be mounted in a single vehicle.

f. **Future Ground Combat Vehicle.** 34 Officers with Stryker or Bradley experience rank-ordered possible characteristics of a future combat vehicle from most important to least important (Figure 46).

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Most Important   Vehicle commander able to see 360 degrees under armor

Passenger capacity of nine Soldiers with equipment

Crew members able to see 360 degrees from within the vehicle

Unmanned turret (RWS)

Reloading mounted weapons while under armor

Passengers having 360 degree situational awareness

Vehicle commander able to stand in open hatch while vehicle is operating

Vehicle commander able to operate the vehicle from the open hatch

Least Important   Driver is able to operate the vehicle with the driver's hatch open

Figure 50 – Future Ground Combat Vehicle Characteristics

    g. Soldier Comments. The RPG Protection Kit was seen as reducing the maneuverability of the MRAP due to the increased size and difficulty entering/exiting the vehicle. Current vehicles are seen as lacking maneuverability/off-road capability and reducing crew visibility outside the vehicle. A common recommendation was to install Remote Weapon Station (RWS) on all vehicles.

    h. Summation. Mobility was limited by the size of vehicles and accompanying protection systems. The RPG kit decreased the perceived effectiveness of vehicles. Lighter, more maneuverable or dedicated combat vehicles were more frequently rated effective; Up-Armored HMMWVs were rated higher than some MRAPs. Although opinions are divided over fielding one vehicle per squad or one per team, Leaders stated any future ground combat vehicle should provide both 360 degrees situational awareness for the crew and be able to transport a fully equipped 9 man squad. Most Leaders believe mounting a missile system on the MRAP is a required capability. A means for self recovery was the most desired capability.

9. Counter Sniper/Gunfire Detection System (GDS)

    a. Boomerang. 37 Officers reported experience with the Boomerang GDS, with 81% rating it ineffective at locating enemy small arms fire. Only 6 Officers (17%) stated their system was operational and available for more than 90% of their deployment; 22 Officers (61%) said their system was operational less than 70% of the time. 53% received no maintenance support and received no training on their GDS.

    b. Sniper Awareness Training. The most effective sniper awareness training was conducted at home station, at a Combined Training Center, and in theater. Leader responses indicate deficiencies in sniper awareness training.

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c. **Reaction to Sniper Fire.** Of 35 Officers engaged by enemy snipers, 27 (77%) stated they were equipped with smoke grenades and 15 (43%) were able to effectively employ smoke to obscure the sniper's vision. A sniper's position was identified primarily by sound (43%) and muzzle flash (31%).
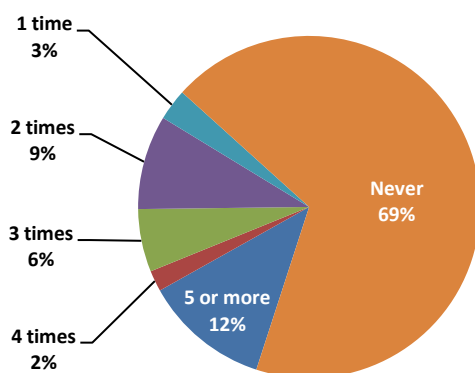

Figure 51 – Frequency of Enemy Sniper Engagements

d. **Summation.** Most officers rated the Boomerang GDS ineffective, likely due to a lack of maintenance support and low operational readiness rates. Few received any formal training on the Gunfire Detection System they were expected to use in theater. There is no emphasis on sniper awareness training once deployed.

10. Unmanned Systems

a. **Ground Robots.** Of the 33 Officers reporting experience with ground robots, 17 had experience with the MARCBBOT (59% rating it effective), 11 with the PACKBOT (64% rating it effective), and 8 with the TALON (100% rating it effective). 88% of all ground robot missions were reconnaissance of a suspected IED position and 28% were to disarm/detonate an IED.

b. **Raven Small Unmanned Aerial System (SUAS).** 54 Officers reported experience with the Raven SUAS and 56% rated it effective. 72% believed the overall training their unit operator received was adequate to operate the Raven. Ravens were operated mostly at the company level (87%) and battalion level (61%). 41 Officers stated they experienced a lost Raven, with 68% reporting a loss of communication as the primary cause. Leaders evaluated the emphasis their chain of command placed on Raven capabilities (Figure 52).
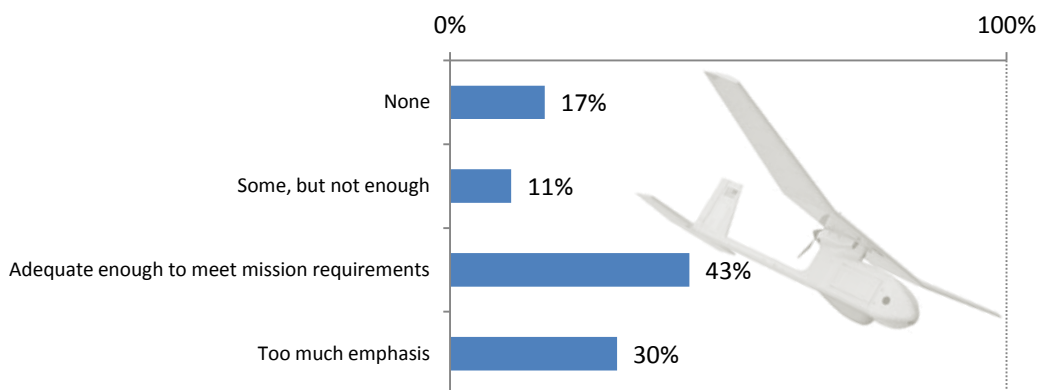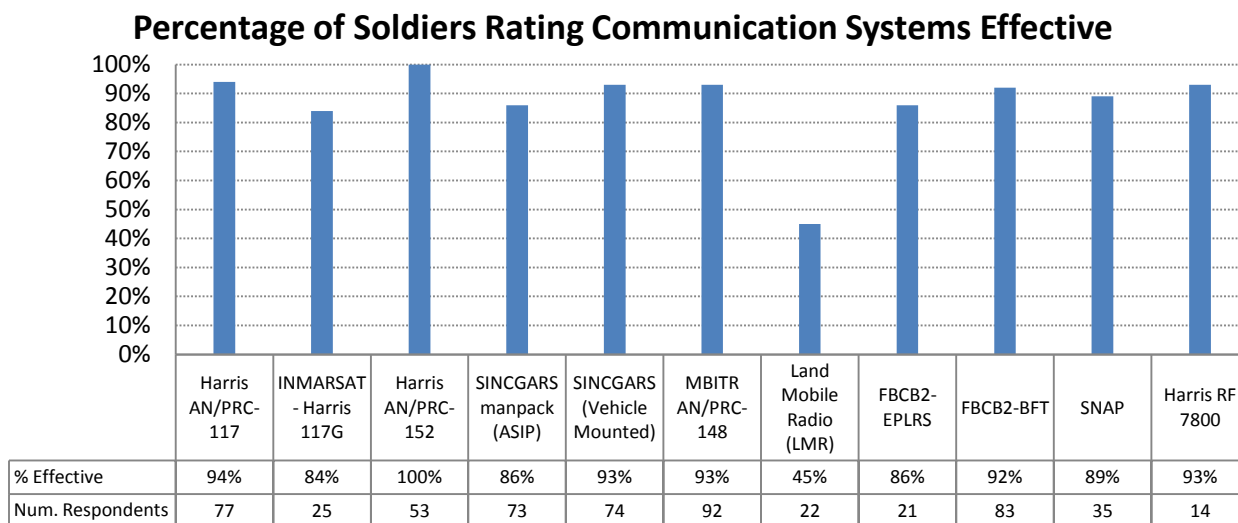
Figure 52 – Chain of Command Emphasis on Raven Capability

c. One Station Remote Video Terminal (OSRVT). 36 Officers had experience with the OSRVT. 81% found it to be effective during combat missions and 72% stated the software interface was user friendly. The majority reported using the OSRVT to interface with aerial systems to include the Shadow (72%), Raven (64%), and manned aircraft (44%). 16 Officers (46%) stated the number of OSRVTs available did not meet their operational needs. 21 Officers (60%) recommended developing a hand-held/Soldier worn version of the OSRVT.

d. Soldier Comments. Leaders are critical of Raven's reliability and unnecessary risk to Soldiers during Raven recovery operations.

11. Mission Command

a. Mission Command (MC) Systems Effectiveness. Of 85 Officers surveyed, 81% considered their MC systems effective for commanding subordinate units while operating dismounted. Of 80 Officers, 76% stated their MC system allowed them to recognize changes to the current Common Operating Picture (COP) in real or near real time.

Percentage of Soldiers Rating Communication Systems Effective

	Harris AN/PRC-117	INMARSAT - Harris 117G	Harris AN/PRC-152	SINCGARS manpack (ASIP)	SINCGARS (Vehicle Mounted)	MBITR AN/PRC-148	Land Mobile Radio (LMR)	FBCB2-EPLRS	FBCB2-BFT	SNAP	Harris RF 7800
% Effective	94%	84%	100%	86%	93%	93%	45%	86%	92%	89%	93%
Num. Respondents	77	25	53	73	74	92	22	21	83	35	14

Figure 53 – Effectiveness of Communication Systems

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Percentage of Soldiers Rating Mission Command Systems Effective

	TAIS	BCS3	TBC/CPOF	DTSS	AFATDS	ASAS/DCGS-A	FBCB2-BFT TOC Kit	CIDNE	TIGR
% Effective	75%	80%	78%	75%	89%	71%	96%	86%	87%
Num. Respondents	4	5	50	4	9	7	67	36	61
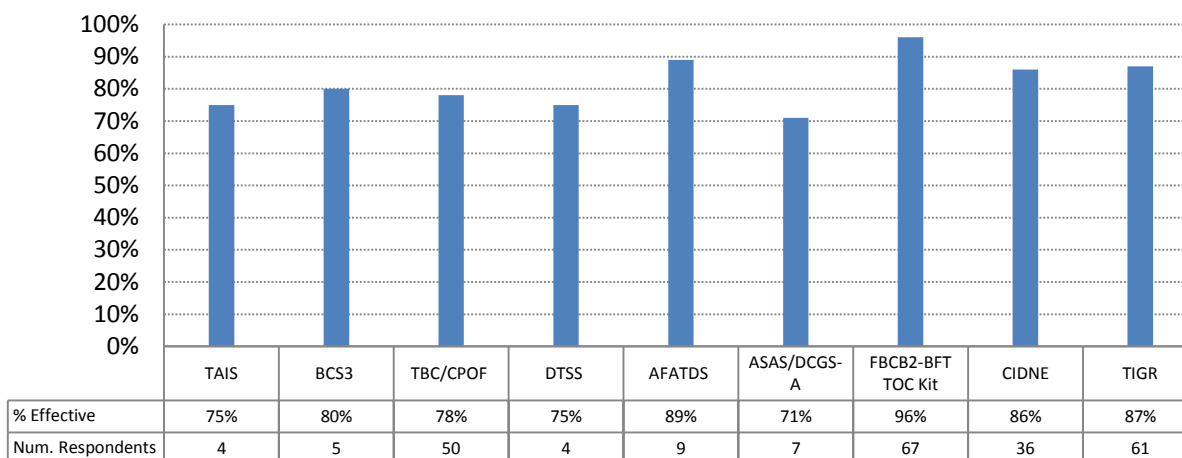
Figure 54 – Effectiveness of Mission Command Systems

b. Platoon Level and Below Operations. The most frequent primary network connections for platoon level and below dismounted operations were MBTR AN/PRC-148 and SINCGARS (ASIP).

Percentage of Soldiers Rating Radio Systems Effective for Platoon and Below Dismounted Operations

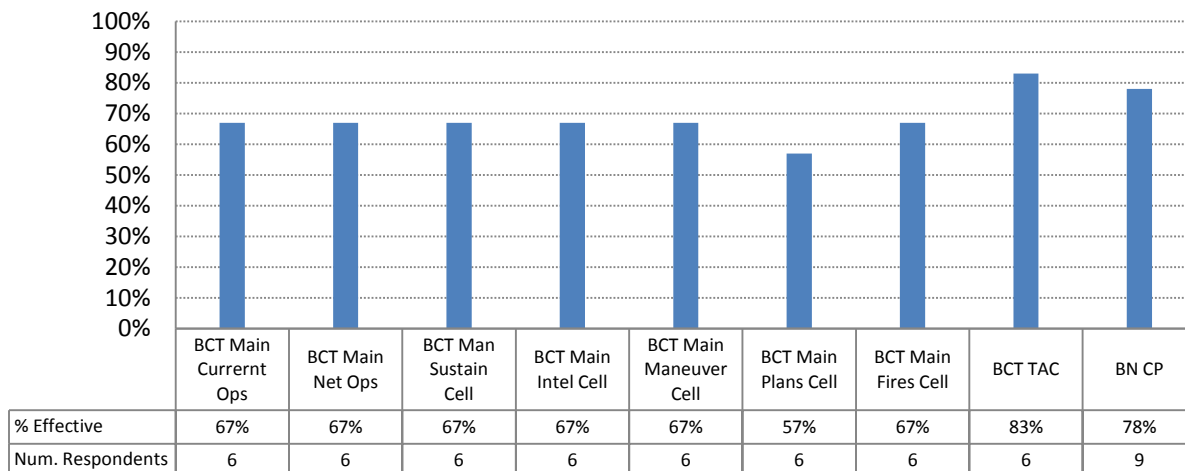|	Harris AN/PRC-117	MBITR AN/PRC-148	Harris AN/PRC-152	SINCGARS manpack (ASIP)	INMARSAT- Harris 117G
% Effective	100%	94%	95%	85%	86%
Num. Respondents	13	51	19	34	7
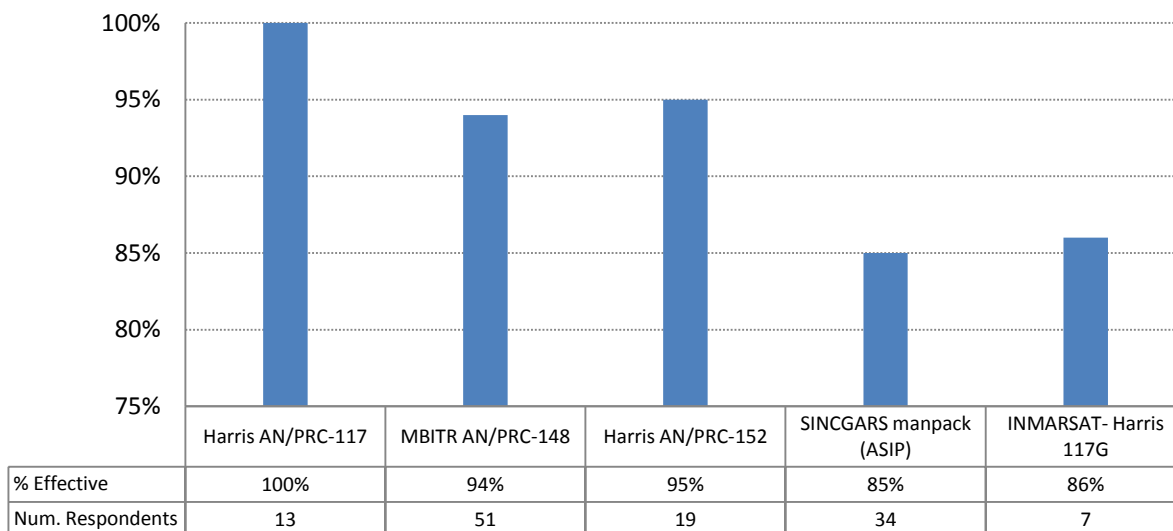
Figure 55 – Effectiveness of Platoon Radio Systems

c. Individual Radio. Of 112 Officers surveyed, 65% stated that all members of an Infantry, Recon, or Engineer team/squad/section should have a full-time radio system.

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d. Trailer Mounted Support System (TMSS). 12 Officers reported experience with the TMSS and 92% stated it provided a suitable, environmentally controlled workspace.

Percentage of Soldiers Rating TMSS Adequate by Section

|	BCT Main Currernt Ops	BCT Main Net Ops	BCT Man Sustain Cell	BCT Main Intel Cell	BCT Main Maneuver Cell	BCT Main Plans Cell	BCT Main Fires Cell	BCT TAC	BN CP
% Effective	67%	67%	67%	67%	67%	57%	67%	83%	78%
Num. Respondents	6	6	6	6	6	6	6	6	9

Figure 56 – Trailer Mounted Support System Effectiveness

e. Mission Command System Integration/Staff Trainer (MCSI/MCST). Of 11 Officers, 72% found their MCSI training effective in preparing them to establish and operate the CP. Of 11 Officers, 66% found the MCST training effective at preparing them for their duties while deployed.

f. Command Post (CP) Operations. Of 34 Officers, 20 stated their CP was in a fixed or semi-fixed site, 4 stated they either remoted or removed servers, routers, and/or other MC systems and components. 18 stated the COP in the BDE/BN CP was displayed via LED or plasma screen display. PowerPoint, BFT/FBCB2 and TIGR were the primary mediums used to gather information, describe the situation, and make decisions. MS Word and PowerPoint were the most common systems used to create warning orders, fragmentary orders, and operations orders. Rehearsals during decentralized operations were done most frequently with MS Word/ PowerPoint and via email.

g. Mission Command On-The-Move (OTM). 94 Officers had mission command requirements while OTM. 73% used the FBCB2-BFT, 54% used the Harris AN/PRC-117 and 53% used vehicle mounted SINCGARS. Only 52% found their unit organization and MTOE met their OTM requirements and a majority 68% stated these systems met their minimum MC requirements while OTM.

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Percentage of Soldiers Rating OTM Systems Effective at Monitoring COP and Maintaining SA by Posture

	Ground (Dismounted)	Ground (Mounted)	Airborne
% Effective	65%	82%	80%
Num. Respondents	80	79	54
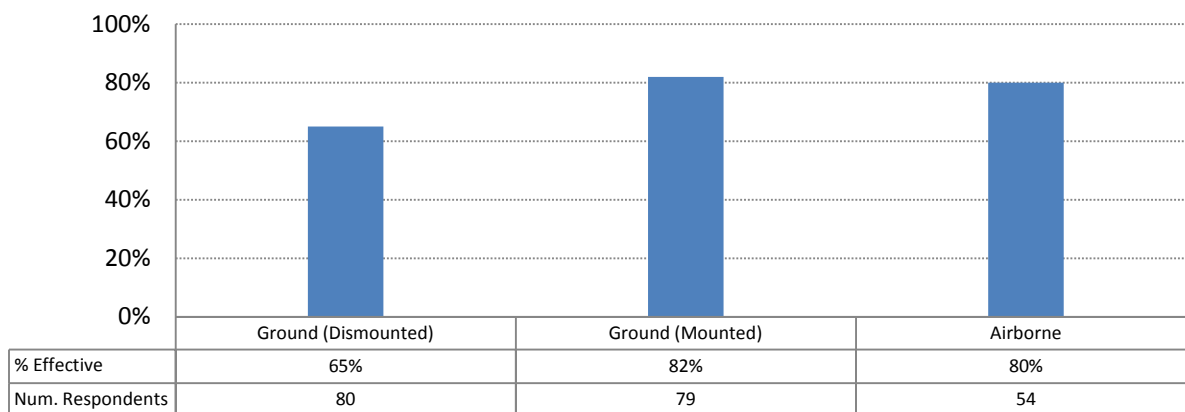
Figure 57 – On the Move Mission Command Effectiveness

h. Soldier Comments. The effectiveness of MC systems in allowing a commander to control subordinate units while dismounted was limited by: the inability of FBCB2 BFT to show dismounted elements, radio range, and the lack of system integration. The difficulty in maintaining radio communications in mountainous terrain was cited often. Combat outposts and dismounted patrols had difficulty maintaining voice and data linkage with higher headquarters due to limited transport or the effects of terrain/range. These same reasons limited commander's ability to monitor the COP or maintain situational awareness while moving.

i. Summation. All radio and mission command systems were considered effective. FBCB2 BFT was the most commonly used mission command system, although it lacked the ability to track dismounted elements. TMSS satisfied workspace needs at multiple command post levels. MCSI/MCST training is lacking for many staff officers. Nearly all CPs used a video display to monitor the COP, which allowed Officers to recognize changes to the common operating picture in near real time. A majority of Officers (65%) favor the individual Soldier radio.

12. Environmental Concerns

a. Environmental Exposure. Officers were surveyed on the three environmental hazards they encountered the most during their deployment. The weighted results are dust, garbage, and sewage are the three most frequently encountered environmental hazards.

b. Personal Dosimeter. 62 Officers (53%) stated the most important attributes of a personal dosimeter are the ability to integrate into the uniform/equipment, data readable while on mission, easily understood status meter, and easy replacement. 54 Officers (47%) stated they did not believe a personal dosimeter was necessary.