STRATEGY RESEARCH PROJECT

ARMY AVIATION SUPPORT TO MILITARY OPERATIONS ON URBAN TERRAIN

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ABSTRACT

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Since its Cold War victory over the Soviet Union, the United States emerged the undisputed global super power. Enjoying the spoils of this cold war victory is proving a sobering task. Increasingly involved in operations other than war, the United States realizes its immense global responsibilities as the sole proprietor for maintaining an unprecedented period of peace. This peaceful period compels the United States to become involved in many global brush fires that range from benign humanitarian assistance to protracted peacekeeping operations. As the world races towards global urbanization, there is a real possibility that the Army will be involved in full spectrum operations in an urban environment. This research paper explores the contributions of Army Aviation to military operations on urban terrain. Specifically, it traces the United States experience in Mogadishu and the ongoing Soviet operations in Chechnya. The paper identifies near-term technological solutions for Army Aviation forces. Finally, it defines an Army Aviation structure and capabilities that is appropriate to reinforce and complement the newly defined Interim Brigade Combat Team.

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ARMY AVIATION SUPPORT TO MILITARY OPERATIONS ON URBAN TERRAIN

There is only one means of preventing decay—never to stop growing, never to become slaves to the present or the past, never to hesitate attempting something new for fear of making a mistake.

J.F.C. Fuller
April 1927

MOGADISHU

By October 1993, the United States was fully engaged in a United Nations peacekeeping operation in Somalia. Operation Restore Hope was initially designed as a humanitarian assistance operation to bring food to the starving masses; however, the operation evolved into full combat in downtown Mogadishu, Somalia. In Blackhawk Down, Mark Bowden vividly describes Army Aviation employment that enabled the Rangers and Delta Force to break the limitations of friction with the ground and rapidly move about the urban expanse of Mogadishu to rapidly execute special operations.

Late afternoon of 3 October 1993, the elite Delta Force and Army Rangers prosecuted a helicopter raid to takedown reputed thug and clan leader General Mohamed Farrah Aidid. The UH-60 helicopters belonged to the highly trained 160th Special Operations Aviation Regiment (SOAR). On final approach a Somali fired a Rocket-Propelled Grenade (RPG) that impacted on the tail of one of the UH-60s. Loss of tail rotor control caused the UH-60 to spin out of control and crashed. Prior to this crash, the United States had successfully conducted six similar missions without incident.[1] This helicopter crash quickly made the news. Riveting images of Somalis dragging dead bodies of American soldiers through the streets scarred the American political leadership to the point of military paralysis. The image of this impromptu tribal celebration haunts the military and the American psyche even today. It now appears that American political leadership is not willing to suffer a single casualty. This operation is troublesome because it demonstrated the vulnerability of the United States premier forces to a poorly equipped and unsophisticated military clan of a third world country.

This operation in Mogadishu captures the unique capabilities and vulnerabilities of Army Aviation in support of Military Operations on Urban Terrain (MOUT). The helicopter is a unique aviation platform. Like a fixed-wing aircraft, the helicopter moves in the three dimensions of space, but the helicopter has the added advantage of hovering above a fixed point. Because of this unique advantage, Army Aviation employs helicopters to insert or extract personnel and equipment in confined areas, conducts reconnaissance and security operations, or engages targets from a safe standoff.

Critics may argue the helicopter lacks sufficient protection and stealth to survive on today's battlefield. Indeed, if critics focus exclusively on this limited Mogadishu experience where an unsophisticated enemy with small arms weapons shot down a special operations helicopter, the picture is not bright.

URBAN REALITIES

GLOBAL URBANIZATION

Global urbanization is a natural consequence of an exploding world population. People migrate to cities to find employment and opportunities to improve their lives. Cities are a complex confluence of people, governments, industry, communications and transportation hubs. Around the world today, developing countries increase their population by 150,000 per day.[2] Exponential growth of cities creates ripe environments for rogue factions to kill many people and quickly blend in with the masses to disappear in the urban landscape.

With the collapse of the Soviet Union and the annihilation of Iraq's credible armed forces, the United States may enjoy a period without a military peer competitor on the horizon for the next 20 years. With the explosion of global urbanization and no military peer competitor to match us in a conventional war waged on open terrain, it appears conceivable that a fledgling opponent might opt for asymmetric warfare in urban terrain; however, there are differing opinions. As Major General Robert H. Scales states:

> Urban warfare doesn't happen all that often. Both sides realize the destructive effects that street fighting may cause. Only a desperate enemy, defending at great disadvantage, willing to sacrifice initiatives, his cities, and a large portion of his military force, has taken to defending cities. A casual glance at the last 500 years of major war history shows that as more of the world blankets itself in urban sprawl, the incidents of actual street fighting have declined.[3]

As the Army attempts to predict the possibility of urban conflict in the future, it may be that Major General Scales's historical precedence is off the mark. A quick glimpse of the last decade clearly demonstrates the great possibility of MOUT in the future. Three recent episodes include Panama City in 1989, Mogadishu in 1992-1993, and Port-au-Prince in 1994. Perhaps Lieutenant Colonel Robert Hahn, Army After Next Urban Warfare Project Director, better foretells the significance of cities to military operations in the future:

> Unfortunately, if demographers and political strategists are correct, the reality is that many, if not most, of the military operations of the next two decades will be conducted in and around large urban areas. Cities—and those connected to clusters of cities called "conurbations"—increasingly will be the political, economical, social, and cultural epicenters around the world. The control of large urban areas will be critical to the successful accomplishment of strategic, operational, and tactical objectives in future conflicts.[4]

URBAN WARFARE

The battlefields of yesterday, today and the future share the intractable dimensions of time and space. Successful commanders embrace these dimensions and are able see themselves in relation to their adversary in terms of their capability to sequence actions in time and in space to win. Determining the metrics of time and space are complicated by the composition and the size of the battlespace. Battlespace may range from the flat featureless desert to heavily vegetated mountains to urban terrain or perhaps a combination. Urban terrain is the most challenging environment to fight and win.

Urban warfare is complex close quarter's combat that can include simultaneous full-spectrum military operations. Former Marine Corps Commandant, "General Charles Krulak has described the

landscape of future urban operations as a 'three block war.' According to Krulak's depiction of the urban battlespace, we can expect to be providing humanitarian assistance in one part of the city, conducting peacekeeping operations in another, and fighting a highly lethal mid-intensity battle in yet a third part of the city."[5]

Envisioning a present-day plan to accomplish Krulak's three block war is too resource intensive in terms of personnel and equipment. In contrast, Major General Scales offers an indirect approach. "This approach requires the establishment of a loose cordon, or siege line, around an enemy-occupied city. ... US and coalition forces would use precision weapons 'to strike selected point targets, key leadership, and weapons of mass destruction' within the surrounded city."[6] This indirect approach compels commanders to accomplish key tasks: identify the location of key nodes and enemy positions, isolate the urban area internally and externally, rapidly penetrate the urban battlespace, conduct decisive operations to destroy or remove the enemy.[7] To fully understand the enormity General Krulak's depiction of the urban fight, we should consider the Russia's MOUT struggle in Grozny, Chechnya.

CHECHEN EXPERIENCE

The Russian experience with urban warfare in Grozny, Chechnya has been painful and protracted. The Russians underestimated the Chechen ability to communicate. The Chechens used numerous information technology gadgets, "especially cellular phones and commercial scanner systems, that allowed the Chechens to communicate easily with one another, ensured the coordination of combat operations, and allowed Chechens to listen in on Russian conversations (thereby proving to be a force-coordination multiplier)."[8] Chechen mobile TV stations proved invaluable in overriding Russian TV signals. President Dudayev could deliver his message directly to his people. The Chechens used the internet to raise funds and obtain assistance from abroad.

A quick examination of essential planning tools (maps and aerial imagery) to Russian forces operating in Grozny reveals an alarming lack of fundamental support. Amazing as it may sound, Russian intelligence agencies could only provide assault commanders with only 1:100,000 scale maps instead of the 1:25,000 or 1:12,500 scale deemed essential for urban missions. "Tactical maps were often made from plain blank paper by hand, with Russian soldiers filling in the sheet with the city vistas (streets, buildings, etc.) in front of them."[9] Overhead imagery was equally in short supply. According to Lieutenant Colonel (Retired) Lester Grau, a Russian military expert, "essential aerial photographs were not available for planning because Russian satellites had been turned off to save money and few aerial photograph missions were flown. Lower-level troop commanders never received vital aerial photographs."[10] Armed with scant essential planning tools (maps and imagery), it is interesting to review the successes and challenges the Russians had in employing aviation in Chechnya.

The performance of Russian ground reconnaissance during the Battle for Grozny (1-26 January 1995) reveals alarming reconnaissance failures. Russian ground reconnaissance units lacked necessary maps, imagery, and adequate mission briefs before conducting reconnaissance missions to have any

hope of success. Insufficient focus and poor communications hampered reporting. Sniper fire paralyzed dismounted Russian scouts. They were reluctant to dismount and root out enemy positions. Russian scouts "did not dare step outside the protection of their armoured vehicle[s] for snipers lurked everywhere, but they saw at every turn of the street what would happen to them if caught by the Chechens."[11]

As we grapple with the viability of Army Aviation support in MOUT, it is helpful to examine the results of Russian tactical air and ground reconnaissance operations. Recent analysis of Russian air power in Chechnya is mixed. "Critics say the Russian tactics are brutal and indiscriminate in attacking Chechen civilians and fighters. Others contend that Russian aviation is doing the job for which it is intended—killing Chechen fighters and keeping the pressure on rebel forces while avoiding the commitment and potential loss of large numbers of Russian infantry."[12] Despite air superiority, Russian air reconnaissance added little to the overall picture of Chechen defensive dispositions. Inadequately resourced and hampered by poor weather conditions, smoke and haze, and the ever-present threat of Chechen small arms fire, air reconnaissance proved marginal in accurately finding enemy positions within Grozny.

Collectively, the American and Russian aviation experience in urban environments has demonstrated both challenges and promise. However, it appears Army Aviation is well-poised to profit from near-term technology improvements and the impetus of General Eric Shinseki's new Army vision to set the conditions for increased relevance and success in Military Operations on Urban Terrain (MOUT).

ARMY VISION

In October 1999 Army Chief of Staff, General Eric Shinseki, announced a new vision for the Army. His vision recognizes the necessity "to build a force that is deployable, agile, versatile, lethal, survivable, and sustainable."[13] "We want the best combination of technologies to provide survivability through low-observable platforms and ballistic protection, and lethality through long-range acquisition, deep targeting, early attack, and first round kill capability at smaller calibers."[14] To this end, he looks at the development of future systems that will deploy strategically by C-17 and by C-130 aircraft for intra-theater lift.

Army aviation offers some unique solutions to achieving General Shinseki's new vision while contributing to MOUT. To help forge an agile force where near-real time situational awareness and assured communications links are a necessity, a legacy system such as the command and control UH-60 (C2) aircraft, upgraded to the Army Airborne Command and Control System (A2C2S), provides state of the art situational awareness, and robust communications. To accelerate and extend the exacting lethality of the AH-64 Apache Helicopter, the Teamed Longbow AH-64D marries an unmanned aerial vehicle (UAV) with the unmatched firepower of the AH-64D attack helicopter. Achieving both General Shinseki's strategic deployability vision and the need for rapid tactical mobility, the Army should pay close attention to our recent experience of the Task Force Hawk deployment.

The 11th Aviation Regiment, composed of two AH-64 squadrons (2-6 and 6-6 Cavalry), strategically self-deployed twenty-four AH-64s from Germany to Kosovo.[15] In Kosovo, the AH-64 was the theater commander's (General Wesley Clark) weapon of choice to complement fixed winged air operations. Political paralysis precluded the employment of AH-64s in Kosovo. However, this deployment showcased the inherent flexibility of the Army's advanced helicopters to have strategic self-deployment relevance while demonstrating incredible employment potential in the harsh mountainous and urbanized terrain of Kosovo. As we look to the future global setting and the ever-increasing trends of urbanization, Army aviation offers unique capacity and unrealized potential to provide relevant support in MOUT. Current and emerging technologies will greatly enhance Army aviation to see and communicate throughout the urban battlespace.

NEAR-TERM TECHNOLOGICAL SOLUTIONS

The success of MOUT or any military operation for that matter is rooted in the enduring requirements for to see and communicate throughout the full dimensions of the battlespace. In urban terrain, these dimensions are above and below the surface as well as inside structures. Hyperspectral sensors embedded with miniaturized cameras coupled together through a maze of communications relays are necessary if we are to see and communicate. Seeing and communicating throughout the expanse of the urban landscape set the conditions to develop a relevant common picture for all the forces involved in MOUT. This is tall order considering our current inability to see and communicate on a flat terrain. Identifying and synchronizing relevant actions to achieve an endstate become critical tasks to orchestrate. Recent leaps in technology, specifically in robotics, offer amazing solutions to these challenges.

ROBOTICS

The Defense Advanced Research Projects Agency (DARPA) has the charter to identify and leverage emerging technology for the military.[16] Miniaturization technology offers startling opportunities for the military as we strive for complete and relevant visualization of the battlefield.

The Micro Air Vehicle (MAV) is a six-inch vehicle that weighs eight ounces that can be launched by tossing it into the air. Equipped with a camera, the MAV is a multi-sensor platform capable of "reconnaissance and surveillance, battle damage assessment, targeting, sensor placement, communications relays, or sensing chemical, nuclear, or biological substances."[17] The MAV can fly itself or it can be guided. Because if its size, it is easily maneuvered in and around buildings. This capability greatly enhances the situational awareness, survivability, and efficiency of forces. No longer will soldiers have to physically perform these life-threatening, time-consuming, and fatiguing tasks. Saturating the battlespace with MAV and data linking them to each other create a near real-time, relevant common picture that will accelerate the tempo of urban operations. Computer-aided technology of facial identification is invaluable in an urban setting. Consider our experience in Bosnia where there are many persons indicted for war crimes (PIFWCs). Finding PIFWCs in a densely populated urban landscape is a

daunting and risky task. Imagine the efficiency and security, of MAVs networked to a computer with facial identification. The computer could alert us to the presence of these critical personnel. We could rapidly respond with a quick response force (QRF) mounted in UH-60 helicopters.

SATELLITES

As the military strives to achieve perfect information in the elusive urban environment, Orbital Sciences offers promising solutions for space-based satellites. Orbital Sciences modified a commercial satellite "which uses hyperspectral imaging to detect chemical and biological weapons, perform damage assessments underground, penetrate foliage to disclose hidden troop concentration."[18]

The US Air Force, National Reconnaissance Office, and DARPA jointly defined requirements for the Discoverer II satellite.

> The Discoverer II system would be capable of generating very high-resolution elevation data (1 meter post spacings) and highly accurate radar imagery. ...It will develop and demonstrate an affordable space-based radar (SBR) with High Range Resolution Ground Moving Target Indication (HRR-GMTI), Synthetic Aperture Radar (SAR) imaging capabilities and Digitized Terrain Mapping Elevation Data (DTED) that will provide reconnaissance, surveillance and precision geolocation support to the tactical warfighter.[19]

Employed in concert with MAVs, a Discoverer II satellite is invaluable in achieving timely and near-perfect information. To leverage this timely and near-perfect information, there should be a precision mission rehearsal tool to perfect a military operation.

TOPSCENE

The U.S. Army Simulation, Training, and Instrumentation Command (STRICOM) developed a battlefield visualization tool called TOPSCENE (tactical operational preview scene). TOPSCENE is fielded in both the Navy and the special operations community.

> The TOPSCENE battlefield visualization system lets aircrew and battle commanders rehearse their missions before going into combat with timely, realistic, real-world images of the contingency area. TOPSCENE provides rapid, accurate database construction for real-time 3D fly-through. TOPSCENE features include a fully scalable open architecture utilizing all Commercial-Off-The-Shelf components. Source Data includes high-altitude, high-resolution photographic and digital source data are combined and processed by the off-site Database Generation System to develop contingency databases. A two-dimensional (2-D), large-area terrain digital map is constructed, draped over polygonized Digital Terrain Elevation Data and enhanced with 3-D cultural data. 3-D Terrain Imagery enhancements permit changes in visibility, time of day, sensor imagery and graphic overlays. TOPSCENE can produce imagery clear enough to see major and minor roads as well as buildings, vehicles, doors, and windows. Using satellite imagery, available photographs and terrain data, the TOPSCENE Database Generation System creates seamless 3-D high resolution databases of terrain and cultural features. These databases are stored on hotswap hard drives, 8 mm tape or digital video disks, which are then distributed to the deployable units. Units in the field can update target locations based on the latest locally acquired data. Vertical photographs are combined with the terrain data, digitized and computer-constructed into a mosaic-orthogonal map containing large digital gaming areas that cover country-sized areas (tens of thousands of square kilometers). The primary training emphasis is inaccessible areas.[20]

DIGITAL NETWORKS

As the tempo of urban operations increases, so will the need to accelerate the delivery of ground commander's relevant capabilities. This is the only assured solution to generate operational momentum. This momentum will keep the enemy off balance and force him to react to our tempo. An Army aviation task force equipped to perform armed reconnaissance, attack, and utility missions offers significant capabilities in solving the ground commander's momentum dilemma. Many actions in urban terrain are characterized hit-and-run activities with short dwell times. To respond in time, the challenge for commanders will be the ability to do near-simultaneous planning and execution.

Developing and sustaining operational momentum requires rapid information sharing. Digital networks are essential in managing information. "For example, since situational awareness is required, systems must be able to fuse information on the network into a common tactical picture. ... Faster engagement coordination means that the network must not only connect sensors and firing platforms, but also must have system that can automatically assign weapon systems to targets and handle the complex problem of air-ground-sea deconfliction."[21] Usher in WARNET. WARNET is a wireless wide area digital network that enables free flow of information.[22] Linking WARNET to the Global Command and Control System gives the commander access to theater and national intelligence as well as mapping data, unit reports, and sensors.

The WARNET enables collaborative planning among separated units. This is done through 'whiteboard' sessions. Marines can draw a scheme of maneuver and indicate targets on the common tactical picture or digital photographs and imagery. Adjacent units can observe and participate in these sessions enabling near instant coordination.[23]

During an exercise, Marines were assigned a mission to secure a weapons of mass destruction site in an urban area. Prior to the operation, the Marines took digital photos of the objective area with a fixed-wing aircraft. This task could be accomplished with satellites or an Unmanned Aerial Vehicle (UAV). These photos were electronically distributed for parallel planning. During the operation, a real-time, digital photo of the enemy leader was sent to intelligence teams to provide verification. Leaving the intelligence team behind reduced the operational burden and risk of casualties.

ARMY AVIATION COMMAND AND CONTROL SYSTEM (A2C2S)

As we survey credible systems that will enhance our abilities to see and communicate in the urban battlespace, there must be a system to capture, synthesize this information to be actioned by relevant players. Mounted inside the UH-60, the A2C2S will be the Army's only airborne command and control system supporting corps, division, and brigade commanders. The A2C2S showcases remarkable situational awareness and command and control possibilities by hosting with the Maneuver Control System (MCS), the All Source Analysis System (ASAS), Army Field Artillery Tactical Display System, and the (FBCB2). These systems are networked together using the A2C2S LAN (Ethernet). The Joint Combat Information Terminal (JCIT) incorporates SINCGARS/SIP, Havequick II, imagery, SATCOM

DAMA (2), SCDL-Echo, weather data, TADIX/TRAP, TRIXS, IDM, Civil Enforcement, Global Positioning System, embedded COMSEC. Further it has enhanced fire control management with artillery, Longbow Apache, Commanche and J-STARS.[24] The beauty of the A2C2S is that system is modular and can be transferred from the UH-60 to a ground facility or the back of an Airborne Command, Control, and Communication C-130.

The enroute mission planning system incorporates a moving map display. Graphics can be drawn on the screen and transmitted immediately via FM. Although this capability is a quantum leap forward, maps only portray a two-dimensional representation of the battlespace. It lacks fidelity and necessary detail for confined operations of the MOUT environment. Real time imagery is essential for aviation platforms to adequately see to provide timely, appropriate, and precise support to ground forces.

Consider the possibility of linking a MAV camera's view via sophisticated satellites to the ground force and aviation platforms. Add the graphic writing ability to these images, and air and ground forces are able to share a common picture that communicates exactly what is ongoing. Graphically, air and ground force commanders can rapidly communicate a solution to ongoing events. Couple this shared-visualization between ground and aviation with clear communication, and there are the makings of a efficient and effective MOUT.

PRECISION GUIDED MUNITIONS AND LASER COM BINOCULARS

The military is enamored with precision guided munitions (PGMs). The love affair began with the debut of PGMs in Vietnam. Antiquated by today's technology, these early PGMs were the Godsend of bomber crews who were able to guide their munitions and successfully drop key bridges in Hanoi. This infatuation fully matured during Desert Shield/Desert Storm as the world watched the exacting lethality of the stealth fighters, tactical-launched air cruise missiles (TLAMs), rocket artillery, and hellfire missiles of the AH-64 destroy Iraq's premier military. Perhaps this infatuation with PGMs, limited our initial involvement in Kosovo to an air-only military solution. This is a dangerous precedence and inappropriate for MOUT where close combat, collateral damage, and noncombatants rule the day.

To insure PGM effectiveness in MOUT, ground force in contact should control PGMs. To that end, the Air Maneuver Battle Lab developed Laser Com Binoculars. The Laser Com Binoculars enable ground soldiers to detect, identify, and obtain global positioning system (GPS) coordinates of targets. Target information is communicated to the aircraft through cell phone to allow employment of PGMs.[25] This capability enables armed helicopters to provide timely and accurate firepower. Ground forces are comforted by the hands-on control of aviation firepower. That same comfort for ground forces may be unsettling to aviators.

LOW COST PRECISION KILL ROCKET (LCPK)

The LCPK is a laser guided 2.75 rocket optimized for MOUT that can be laser guided by ground forces.[26] It is a precision, low-collateral damage ordnance item tailored to lightly armored targets and personnel. Warheads include high explosive, smoke, and CS. The beauty of this low-cost munition is

that an AH-64 can carry a maximum of 76 rockets. Carrying a rocket mix of CS, smoke, and HE, one AH-64 provides the ground commander a rheostatic firepower capability that ranges from the nonlethal fires of CS and smoke to the lethal fires of HE. This rheostatic firepower affords ground forces a broader range of relevant firepower solutions.

AH-64D LONGBOW TEAMING WITH HUNTER UAV

The Airborne Manned/Unmanned System Technology (AMUST) links the AH-64D Longbow Apache helicopter with the HUNTER unmanned aerial vehicle (UAV). This teaming initiative is a novel idea that will greatly enhance the survivability and situational awareness of AH-64D aircraft.

AH-64D incorporates millimeter-wave radar that sees through adverse weather and electro-optical countermeasures. "The FCR (Fire Control Radar) enables the Longbow Apache to classify targets (i.e., tracked, wheeled, air defense, hovering, flying), prioritize them, and then conduct multiple engagements with RF (radio frequency) Hellfire missiles...."[27] TRW and Israel Aircraft Industries jointly developed the HUNTER UAV. "The Hunter has a maximum altitude of 15,000 ft. AGL and a payload of two hundred pounds with an endurance of 8.5 hours."[28]

This teaming concept allows AH-64D crews to locate, identify and target the enemy, and share the information in real time with friendly forces. AH-64D crews are able to manually control the HUNTER and its sensor package.[29] Employed in an urban setting, the AH-64D capability offers great promise.

JOINT INITIATIVES

The Air Force seeks to develop an airborne countersniper/counterfire device to respond to both rifle and mortar attack. In Bosnia, AC-130s were successful in artillery detection. The Air Force plans to enhance the infrared detection system on the AC-130 to detect rifle fire.[30] The AC-130 can loiter over the urban battlespace for hours keeping watch with its enhanced IR detection system. Armed with substantial firepower (20mm minigun, 40mm Bofors cannon, and 105mm artillery) the AC-130 is a very capable platform in MOUT.

The Air Force wants to modify lethal munitions so those munitions can be employed in an urban environment to minimize collateral damage with less risk to civilian bystanders. "The enhancements could include the use of laser-guided weapons with micro-warheads, miniature munitions, and special fuses that allow regular bombs to function as kinetic energy-only weapons because their explosives are disabled."[31]

ARMY AVIATION TASK FORCE CONTRIBUTION TO MOUT

AVIATION TASK FORCE

To successfully support the full range of operations inherent in General Krulaks's "three block war," an Army aviation brigade-sized task force is probably the correct headquarters. A typical heavy divisional

aviation brigade has a cavalry squadron, AH-64 attack battalion, and UH-60 General Support Aviation Battalion (GSAB).

The cavalry squadron has (16) OH-58Ds, (17) M-1s, and (41) M-3s. The attack battalion has (24) AH-64s. The GSAB has (30) UH-60s, (4) UH-60 C2, and (4) UH-60 Quickfix helicopters. The beauty of this aviation structure is the organic capabilities of air and ground reconnaissance, attack, air assault, air movement, and aerial command and control. Augmenting the aviation brigade with a CH-47 company, and MEDEVAC detachment from its corps aviation brigade, enhances the aviation brigade's ability to rapidly insert a large number of troops and light vehicles and provide necessary aerial medical evacuation.

PLANNING

Envisioning General Krulak's "Three Block War" with three simultaneous operations of humanitarian assistance, peacekeeping, and fighting a highly lethal mid-intensity battle in one city is mind boggling yet plausible. The aviation brigade must be prepared to plan aviation support for these three simultaneous MOUT operations. The scope of the aviation brigade's planning should include: identification of resources outside the brigade necessary to accomplish the mission, defining the battle space, assigning areas of operations with clear task and purpose, and developing a detailed execution matrix.

During execution the aviation brigade monitors these operations and maintains the agility to orchestrate unanticipated needs for aviation support. In other words, the aviation brigade must have preplanned multifaceted aviation packages that are capable of a wide array of missions. For example, an assault platoon (five UH-60s) is assigned be prepared missions to conduct quick reaction force insertion, nonstandard casualty evacuation, emergency aerial resupply, noncombatant evacuation, aerial command and control, and downed aircraft recovery team (DART). Each of these missions represents a relevant aviation contribution to the ground commander. The ability to rapidly orchestrate an audible mission is the greatest contribution Army aviation can make. This is especially critical in MOUT where enemy actions are unpredictable and have short dwell times. Effective command and control of these complex missions is better executed through the aviation brigade's subordinate battalions. Army aviation task force commander in support of MOUT must possess real-time imagery and redundant uninterrupted communications that can be shared with all his aircraft and the supported ground commander. Success will be determined by ability to create and train an aviation task force with a diverse capability to provide aviation support in MOUT. To help forge an agile force where near-real time situational awareness and assured communications links are a necessity, the Army Airborne Command and Control System (A2C2S) provides state of the art situational awareness, and robust communications. Employing TOPSCENE down to company-level enables aircrews to observe and listen to ongoing operations. To accelerate and extend the exacting lethality of the AH-64 Apache Helicopter, the Teamed Longbow AH-64D marries an unmanned aerial vehicle (UAV) with the unmatched firepower of the AH-64D attack helicopter.

COMMAND, CONTROL AND MISSIONS

Considering MG Scales's guidance for urban operations, it is appropriate that the cavalry squadron, with its air and ground reconnaissance assets, has the mission to cordon the urban area of operations. The cavalry commander commands and controls all the urban cordon operations. Similarly, the attack battalion conducts attacks from support-by-fire positions into that area of the urban landscape engaged in full-scale combat. The attack commander commands and controls all aviation operations in that geographic area designated full-scale combat. Employing 2.75 rockets multiple munition types, the attack commander can apply his arsenal of rehostatic firepower from the nonlethal CS and smoke to high explosive munitions. The GSAB has the mission to conduct an air movement of noncombatants from the geographic area designated peacekeeping. The aviation brigade commands and controls aviation operations in the remaining battle space. This framework provides clear delineation of missions and definitive area of operations which is appropriate for these aviation units. This framework is necessary to facilitate audible aviation operations into the urban battlespace.

Consider the assault platoon discussed earlier in planning, the aircrews would be prebriefed about the general aspects of their be prepared missions that could occur anywhere in the aviation brigade's urban battlespace. To be successfully executed, aircraft must be ready for engine start and the aircrews must be located where they can hear and see ongoing operations. Perhaps the assault platoon could watch the entire operation unfold on TOPSCENE and listen to the radios. With TOPSCENE, the aircrews would have near-perfect situational awareness. For example, an AH-64 (damaged by an RPG) makes an emergency landing. It is deemed necessary to launch aircraft to execute a DART mission. Aircrews can compress takeoff times if they have virtually observed the operation on TOPSCENE. Incorporating WARNET capabilities from the A2C2S command and control UH-60, the on-scene aviation commander can data link scalable maps and imagery with detailed graphics of flight routes, landing zones, friendly and enemy locations, and communication protocols directly to the DART aircraft. Imagine the efficiency and exacting application of Army Aviation if we had these abilities today.

CONCLUSION

Recent US conflicts in Panama City, Mogadishu, and Port-au-Prince coupled with the explosion of global urbanization send a clear signal that future US conflicts will most likely involve urban settings. With no military peer competitor on the immediate horizon to match us in a conventional war waged on open terrain, it is conceivable that a fledgling opponent might opt for asymmetric warfare in urban terrain. Urban warfare is tough business that will not be solved by technology alone. However, as we surveyed the technological contributions of each service to the urban problem, there is certainly promise for greater efficiencies.

To face these emerging challenges of the 21st century, the Army plans to test the Interim Brigade Combat Team (IBCT). "The IBCT is a unique organization. It is designed to deploy independently and functions as an ARFOR, under a Joint Task Force, for small-scale contingency operation, or as part of a division in a major theater of war."[32] A quick examination of the force structure reveals cause for alarm.

There is no Army aviation in the force design. This is contrary to Army experience. At the combat training centers, an aviation task force always deploys as part of rotational brigade combat teams. Considering the contributions of Army aviation during Operation Just Cause in Panama and Operation Desert Shield/Desert Storm in the Middle East, a reasonable military professional must question this oversight. Prior to IBCT, the Army crafted Strike Force that was well resourced with a capable Army aviation package. What was the rationale for abandoning this capability?

In Future Warfare, Major General Robert Scales identifies the criticality of mobility as it relates to precision munitions and detection. "This year's AAN war games indicate that, unless the speed of movement increases substantially, those improvements in detection and the precision-fire delivery will make offensive action more difficult."[33] In other words, as the time-competitive cycle of accurate detection and precision fires, compresses--maneuver must be commensurate with the precision and rapid rate of detection and firepower. A ground-based only solution to the Army's future mobility requirements can not keep pace. The friction of ground mobility spikes dramatically in an urban environment. Therefore, a ground-based only solution is doomed to failure.

The Army should restructure the IBCT with an aviation task force. The aviation task force should possess the inherent reconnaissance, surveillance of a cavalry squadron, the precise and rapid firepower of an AH-64D Teamed attack battalion and the mobility of an UH-60 Assault Battalion such as the aviation brigade discussed earlier. Leveraging existing technologies of TOPSCENE, A2C2S, AH-64D TEAMED, nonlethal weapons and near-term technologies of micro unmanned aerial vehicles linked to sophisticated satellites such as Discoverer II will revolutionize urban warfare for the United States armed forces.

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[24] Gerald R Davis, A2C2S System, February, 9, 2000.

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