

**PROCEEDINGS OF THE 2010
ZVI MEITAR INSTITUTE
FOR LAND WARFARE STUDIES
"FIGHTING IN URBAN TERRAIN" CONFERENCE**

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*The Zvi Meitar Institute
for Land Warfare Studies,
Latrun*



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This document is also posted on the ILWS website at <http://www.ilws.org.il/eng/>

The ILWS was born in 2007 as an offspring of the 2006 Second Lebanon War. The inspiration of Brigadier General (IDF, retired) Gideon Avidor (See Figure 1.1), its founding was supported by veterans of the Israeli Armored Corps Association, a non-profit organization best known for managing the country's armor museum and memorial at Latrun. The institute's driving motivation: a belief that wisdom never dies; what Israeli's armor corps veterans learned on battlefields at so great a cost should be assembled, organized, and made available to current generations of Israelis and those of the nation's friends worldwide for use in readying for security challenges. The ILWS quickly established itself as a forum in which veterans' insights and historical documents are made available so that they can be blended with our present understanding of conflict, thereby creating a chemistry in which old and new allow us to better comprehend contemporary conflict. The support of philanthropist Zvi Meitar (Figure 1.2) was fundamental to the institute's evolution from concept to permanency.

ILWS activities and resources span a wide spectrum of land warfare operations, to include combat, combat support, logistics, intelligence, information warfare, and much more. Institute members are proud to have supported a considerable number of Israeli and international research efforts and educational initiatives at both the individual and organizational levels in the organizations as of yet brief history. These vital interactions include hosting military visitors from around the world to discuss issues of common interest during conferences, seminars, and one-on-one exchanges. Since its creation, the ILWS has conducted a number of high-level seminars and conferences at which veterans and practitioners discussed issues vital to national and international agendas. These include "The War Against Terror and



Figure 1.1: BG (IDF, retired) Gideon Avidor, Founder of the Zvi Meitar Institute for Land Warfare Studies



Figure 1.2: Zvi Meitar Signing the Cornerstone Document for the Institute Bearing his Name

its International Law Implications," "Land Maneuver in the 21st Century," and the 2010 "Fighting in Urban Terrain" conference of which the cornerstone ceremony was a part.

Attended by notables from both Israel and points more distant, those assembling for the cornerstone ceremony celebrated the initial step toward creation of a permanent home for the nonprofit committed to educating any seeking to draw on the knowledge and experiences of Israel's armor veterans, the Israeli Armor Corps archives, and the many educational offerings sponsored by the ILWS.



Figure 1.3: Israeli Armor Corps Association Veterans and Honored Guests at the Conclusion of the Zvi Meitar Institute for Land Warfare Studies Cornerstone Laying Ceremony, From Left to Right: Colonel (retired) Chayim Adini, Brigadier General (retired) Gideon Avidor, Brigadier General (retired) Menashe Inbar, Dr. Russell W. Glenn, Mr. Zvi Meitar, Major General (retired) Chayim Erez, Major General (retired) Menachem (Mendi) Maron

Preface

The Zvi Meitar Institute for Land Warfare Studies (ILWS) held its fourth annual conference on October 5-7, 2010 at the Israeli Armor Corps Museum and Memorial, Latrun, Israel. The even was co-hosted by the ILWS, Israel Defense Forces (IDF) Ground Forces Command (GFC), Israeli Armor Corps Association (IACA), and U.S. Joint Forces Command (U.S. JFCOM).

Corporate sponsors both contributed presentations and provided industry displays throughout the three-day period. (Corporate participants and available descriptions appear in Appendix 4.) Speakers from Israel, the United States, and Australia addressed a broad spectrum of challenges inherent in ongoing and future urban operations during the second and third days of the conference, the first day having focused specifically on urban survivability and force protection issues. Registered attendees numbered in excess of 500 and included over 95 international representatives from in excess of 27 nations.

This research was conducted within the Global Security Warfighter Solutions group of A-T Solutions, Inc. For more information on A-T Solutions research, other capabilities, or enquiries regarding this document, please contact the author at russglenn@a-tsolutions.com or visit the company website at www.a-tsolutions.com.

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Executive Summary

The Zvi Meitar Institute for Land Warfare Studies (ILWS) held its fourth annual conference in Latrun, Israel from October 5-7, 2010. The theme of this event was maneuver in urban environments. The Day 1 focus was force protection and survivability in these challenging arenas while that for the second and third days included tactics, intelligence operations, fire support, and the legal and ethical implications of combat in densely populated areas. Attendees numbered some 500 and included international representatives from over 27 nations. Speakers from Israel, the United States, and Australia presented on the above topics, drawing from analyses of Operation Cast Lead (Gaza, 2008-2009), 1982 Lebanon, Operation Iraqi Freedom, 1994 and 1999 Chechnya and actions in 1999 East Timor.

The following pages review operationally relevant material regarding these many presentations. From it are drawn a number of lessons presented in “call outs” (boxes with the header “Lesson” atop each) for ease of reader reference. Four chapters (an introduction, “Establishing the Continued Requirement for Proficiency in Urban Operations Maneuver,” “Meeting the Demands of 21st-Century Urban Operations,” and a conclusion) are followed by appendices respectively providing the conference agenda, available presenter biographical sketches, abstracts of presentations, descriptions of the commercial sponsors, and a list of international attendees.

The lessons shown in the call outs from throughout the main body of this proceedings are as follows:

Though completely avoiding densely populated and limited line-of-sight environments will rarely be feasible when urban areas are in an area of operations, concluding that forces must be committed to urban combat should not be a default assumption. It may be possible to bypass given locales, isolating the threats within and dealing with them later as necessary. Alternatively, it may be feasible to avoid the worst of urban areas’ difficulties through appropriate choices of tactics, forces, and other operational variables.

• • •

Today’s urban operations demand truly comprehensive campaign plans, ones integrating nongovernmental organizations, intergovernmental resources such as

those provided by the United Nations, other-than-government capabilities, and greater interweaving of nonlethal approaches. Such plans must span the entirety of the operations involved, from preparations before initiation to beyond actions on the objective and include such issues as capacity building and disarmament, demobilization, and reintegration (DDR) initiatives.

• • •

One size does not fit all during urban operations. Having failed with their 1994 and 1999 “thunder run” penetration attacks to seize Grozny, Russian forces pulled back and conducted an attack more reminiscent of German World War I Hutier infiltration tactics to take the capital. The attackers thereby demonstrated an ability to adapt operationally, tactically, and logistically. Western nations should seek to improve their urban operations training for operational-level commanders and staff the better to not replicate the mistakes made by Russian leaders. They should, however, attempt to replicate the timely adaptations those leaders made in the short period between the First and Second Chechen Wars, e.g., introduction of personal equipment and weapons systems better suited to field conditions when earlier capabilities were found wanting.

• • •

The dramatic growth of cities worldwide should not rule out consideration of historically proven approaches to urban operations. Evacuating noncombatants, isolating an urban objective, and communication with power brokers are but three recently demonstrated, longstanding techniques that have proven successful in the past and will likely again prove feasible in the future. Adaptation may allow for their use in new, innovative ways as well, for example by isolating and evacuating civilians from selected neighborhoods of cities too large for application of such actions on the whole of the urban area.

• • •

The complexity of today’s cities suggests that it is advisable to conduct long-term, multidisciplinary studies of select urban areas deemed of likely future operational importance.

• • •

Partnership with indigenous representatives is fundamental to eventual success during urban counterinsurgency operations. The contact inherent in developing these partnerships has the immediate benefit of providing “an expanded form of intelligence” beyond that focusing only on threat capabilities and intentions.

• • •

Be alert for disconnects between higher echelon perceptions and reality on the ground. Higher headquarters may fail to discriminate between the many interests, parties, and threat types evident to those conducting effective information collection and analysis at lower levels during urban operations.

• • •

Collecting, verifying/validating, and processing HUMINT is more time consuming than similar processes for most other types of intelligence. This slowness and the complexity of urban areas can be overcome somewhat by decentralizing information processing and intelligence distribution decisions and providing well-conceived guidance for those conducting intelligence operations at lower echelons. That complexity and the enhanced role of the population as a key – if not decisive – element during urban operations likewise demands innovation in applying established doctrine, e.g., in identifying what qualifies as “key terrain.”

• • •

The combination of cover, concealment, proscribed targets, and concerns regarding both friendly force and noncombatant casualties during urban operations suggests greater restraint in the use of firepower and the more frequent use of movement to force an enemy to relocate from prepared positions, thereby exposing itself to killing fires.

• • •

While demobilization, disarmament, and reintegration (DDR) programs are often highly desirable to assist in reducing the potential threat posed by former armed combatants, it does not follow that any or all of those undergoing DDR must go into the security sector.

• • •

Counterinsurgency success is often a fragile accomplishment requiring long-term commitment of the counterinsurgent to its maintenance. As the case of East Timor demonstrates, deployments needed to maintain stability often focus on urban areas.

• • •

Regardless of the improvements made as a result of recent urban operations in southern Lebanon, Iraq, the Occupied Territories, Afghanistan, or elsewhere, many of the same problems that have historically degraded operational effectiveness have yet to be addressed satisfactorily.

• • •

Military-media relations remain a work in progress for parties in both groups. Media representatives in many cases failed to adequately maintain their objectivity during the 2006 Second Lebanon War, *de facto* permitting Hezbollah to censor outgoing products. The Israeli government's policies during Operation Cast Lead (OCL) two years later perhaps in part reflected a concern that the international media had not been neutral in that earlier conflict. The severe restrictions placed on correspondents during OCL, however, ultimately worked to Israel's disadvantage. Relevant publics were poorly informed. Media representatives were effectively barred from the operational area and thus could not adequately determine ground truth. The IDF later found it had few disinterested witnesses able to support the Israeli military's responses to pointed accusations published in the Goldstone Report.

• • •

State actors are held to a higher standard of behavior during conflicts than non-state combatants. The resulting expectations can have consequences directly impacting political decision makers and operations in the field. One possible means of in part addressing the imbalance may be for both media and military representatives to cultivate greater mutual understanding.

• • •

Considering staying below the media "information threshold" before H-hour, D-day so as to minimize the likelihood of preliminary adverse publicity.

• • •

Similarly contemplate breaching the information threshold only at night when media is less capable of monitoring operations. This was particularly important during operations in November 2004 Fallujah given that some media representatives had previously demonstrated an anti-coalition bias.

• • •

Plan for and take appropriate action both in terms of tactics and media information for cases of the enemy sacrificing the sanctity of protected facilities such as mosques. Minimize the damage to such structures even when the behavior of the enemy makes them legitimate targets, e.g., removing only the tops of mosque minarets used by snipers rather than destroying the entire structure.

• • •

Provide media representatives information packages explaining recent and ongoing operations. See Figure 3-7 for an exemplar.

• • •

Admit that, "We're not perfect." If the wrong story gets out, correct it.

Acknowledgments

The annual ILWS conference is the result of several gentlemen’s foresight, innovation, and support. Brigadier General (IDF, retired) Gideon Avidor, founder and inspiration behind the nonprofit Zvi Meitar Institute for Land Warfare Studies and Zvi Meitar, patron and unceasing champion of the nonprofit organization, are in excellent company atop this list. With them are MG (IDF, retired) Chayim Erez and the members of the Israeli Armor Corps Association (IACA) whose passion has continued unabated since the first of the events.

Others notably worthy of recognition include government, private, and commercial co-host and sponsor organizations the support of which is invaluable to a successful event with such worldwide participation. Hosts in addition to the ILWS and Israel Defense Forces Ground Forces Command included the IACA, on whose site the event was held, and U.S. Joint Forces Command (U.S. JFCOM). Both the IACA and U.S. JFCOM are notable in their having acted as co-hosts for all four of the conferences to date.

The following industry leaders – whose exhibitions were a highlight of the three-day conference – sponsored the event:

- Astronautics
- Bluebird Aero Systems
- Elbit Systems, Ltd.
- Eltics, Ltd.
- Hydro-Noa, Ltd.
- Israel Aerospace Industries (IAI)
- Israel Military Industries, Ltd. (IMI)
- LVT – High Tech Fire Protection
- Ness Technologies
- Netline Communications Technologies, Ltd. (NCT)
- O.D.F. Optronics, Ltd.
- Plasan
- Rafael Advanced Defense Systems, Ltd.
- Senso Optics
- Shilat Optronics, Ltd.
- Urban Aeronautics, Ltd.
- Urdan

Several of the author's friends and professional colleagues additionally assisted in suggesting or coordinating international speaker participation and, in some cases, further assisted by forwarding their country's definition of "maneuver" (or "manoeuvre"). These include Colonel (USMC, retired) Jay Bruder, Mr. Ted Cranford, Dr. Louis A. Dimarco, Colonel Chris Field (Australian Army), Lieutenant Colonel David Lambert (Canadian Army), Brigadier General James F. Pasquarette (U.S. Army), and LTG (USMC, retired) John Sattler.

The outstanding quality and success of the Institute for Land Warfare Studies conference each year is in no small part attributable to a woman whose behind the scenes efforts underpin virtually every element from initial dispatch of invitations to the final printing of these proceedings. The author offers a special thanks to Ms. Hofit Fraimovich for her support of his work with the event's international speakers and later creation of this document

Glossary

Acronym	Expansion/Explanation
AG	Aktiengesellschaft (German for stock corporation)
BA or B.A.	bachelor of arts degree
BCT	brigade combat team
BG	brigadier general
BS or B.S.	bachelor of science degree
C4	command, control, communications, and computers
CAS	close air support
CEO	chief executive officer
COIN	counterinsurgency
COIST	company intelligence support team
Col	colonel
CSCE	Commission on Security and Cooperation in Europe
D-Day	day for initiation of an operation or activity
D+1	day for initiation of an operation or activity plus one day
DDR	disarmament, demobilization, and reintegration
DHS	Department of Homeland Security (U.S.)
DoD	Department of Defense (U.S.)
DOJ	Department of Justice (U.S.)
FALINTIL	Armed Forces for the National Liberation of East Timor (acronym derived from Timorese name for the group)
FMSO	Foreign Military Studies Office
FRAGO	fragmentation order
G2	staff section responsible for intelligence in a service command led by a general officer
GFC	Ground Forces Command (IDF)
GHQ	general headquarters
HBCT	heavy brigade combat team
H-Hour	hour for initiation of an operation or activity
HUMINT	human intelligence
IACA	Israeli Armor Corps Association
IAI	Israel Aerospace Industries
ICAT	International Coalition Against Terrorism
ID	infantry division

Acronym	Expansion/Explanation
IDF	Israel Defense Forces
IED	improvised explosive device
ILWS	Zvi Meitar Institute for Land Warfare Studies
IMI	Israel Military Industries, Ltd.
IMINT	imagery intelligence
IMOD	Infrastructure Modernization program (German)
IOSB	Fraunhofer-Institute of Optronics, System Technologies and Image Exploitation (a German commercial company)
ISAF	International Security Assistance Force (North Atlantic Treaty Organization-led mission in Afghanistan)
ISF	Iraqi security forces
J1	personnel staff section on a joint staff (U.S.)
J7	joint training directorate (U.S.)
J8	policy advisory section on a joint staff (U.S.)
J33	current operations section on a joint staff (U.S.)
JFCOM	U.S. Joint Forces Command
LNO	liaison officer
LOO	line of operation
LTC	lieutenant colonel
LTG	lieutenant general
M1	model of tank, the Abrams (U.S.)
MA or M.A.	master of arts degree
MAJ or Maj	major
MFO	Multinational Force Observer
MG	major general
MNF	Multinational Force
MOD or MoD	ministry of defense
MON	Ministerstwo Obrony Narodowej (Ministry of Defense-Poland)
MVO	Member of the Royal Victorian Order
NCT	Netline Communications Technologies, Ltd.
OCL	Operation Cast Lead
OIF	Operation Iraqi Freedom (often appears with a number following to designate the phase, e.g., OIF1 = Operation Iraqi Freedom, phase 1)

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LAND WARFARE STUDIES “*FIGHTING IN URBAN TERRAIN*” CONFERENCE

Acronym	Expansion/Explanation
Ph.D.	doctor of philosophy degree
PLO	Palestine Liberation Organization
QMI	Queensland Mounted Infantry
RA	Royal Artillery
R&D	research and development
Ret or ret	retired
RPG	rocket-propelled grenade (also used to refer to the launcher for such grenades)
S2	staff section responsible for intelligence in a service command led by a field grade officer
S3	staff section responsible for operations, plans, and training in a service command led by a field grade officer
SIGINT	signals intelligence
SSO	special security officer
TNI	Tentara Nasional Indonesia (Indonesian National Armed Forces)
TOW	tube-launched, optically-tracked, wire-guided anti-tank missile system (U.S.)
TRADOC	Training and Doctrine Command (U.S. Army)
UAV	unmanned aerial vehicle
UK	United Kingdom
USAF	United States Air Force
USARI	United States Army Russian Institute
USMC	United States Marine Corps
WWII	World War II

1. Introduction: The Continuing Urban Operations Challenge

By the 2030s, five billion of the world's eight billion people will live in cities. Fully two billion of them will inhabit the great urban slums of the Middle East, Africa, and Asia. Many large urban environments will lie along the coast or in littoral environments. With so much of the world's population crammed into dense urban areas and their immediate surroundings, future joint force commanders will be unable to evade operations in urban terrain. The world's cities, with their teeming populations and slums, will be places of immense confusion and complexity, physically as well as culturally.¹

*Joint Operating Environment 2010,
U.S. Joint Forces Command*

The forecast is that, next to the Israeli border in a strip of 50 kilometers depth, about 20 million people will live in 2020.²

*Professor Arnon Soffer
as quoted by Major General Sami Turgeman*

Those 20 million estimated to be living within 50 kilometers of Israel's borders by 2020 will in many cases be packed into cities, living in villages tucked into the difficult terrain of southern Lebanon, or otherwise occupying urban areas whose dense populations and closely packed structures pose potential nightmares for any whose missions take them into – or cause them to fly over – their potentially deadly streets. Even more so than today, those environments will be congested, cluttered, contested, and characterized by myriad physical, social, economic, and other connections too complex to fully untangle. Further complicating operations: nation state armed forces representing civilized nations will find themselves significantly constrained in the approaches available for seeking mission accomplishment.³ In short, despite the increased proficiency gained thanks to recent urban operations in Iraq, Afghanistan, Gaza, and elsewhere, tomorrow's armed forces will find that they

- 1 The JOE 2010: Joint Operating Environment, Norfolk, VA: U.S. Joint Forces Command, 2010, p. 57.
- 2 Major General (IDF) Sami Turgeman, "The City as an Operational Challenge," presentation at the 2010 Zvi Meitar Institute for Land Warfare Studies "Maneuver in Urban Terrain" conference, October 6, 2010.
- 3 This combination of congested, cluttered, contested, connected, and constrained is found in *Strategic Trends Programme: Future Character of Conflict*, London: Ministry of Defence, February 2010, p. 21-25.

must continue to train for maintaining those hard won skills. They must also keep a wary eye on field conditions; threat evolution; and their own doctrine, training, equipment, and organizational structures to ensure their proficiency does not become outdated as time passes. Complacency regarding urban operations capabilities will be an unaffordable luxury for any military wishing to maintain a force up to the challenges posed by undertakings in future villages, towns, and cities.

Maneuver in urban environments was the topic for the three days of conference at Latrun, Israel from October 5-7, 2010. The over 500 in attendance, to include nearly 100 international representatives from some 27 nations, heard from experts and veterans addressing contingencies as varied as combat in southern Lebanon, fighting in the densely populated Gaza Strip, operations in the major city of Baghdad and struggles to establish stability in East Timor and Afghanistan. (See Appendix 5 for the list of international attendees.) The conference's first day took force protection as its focus. While technology exhibits were a highlight throughout the three days, technological approaches to addressing survivability challenges dominated day one. Lieutenant General (U.S. Army, retired) Thomas F. Metz, former Director of the Joint IED (improvised explosive device) Defeat Organization, made clear the extent of the threat posed by these munitions and their influence on operations both today and in the future. The IDF's Colonel Baruch Mazliach followed with a discussion of how Israel has addressed the broad range of threats confronting soldiers on today's battlefields. Colonel Mazliach, head of the Merkava tank production program, outlined the tribulations confronting any who must design or adapt weapons systems to urban environments and the way in which his own country has sought to do so within the construct of its unique strategic situation.

An overarching theme evident in nearly every presentation over the trio of days was the need for campaign plans and supporting operations plans to synchronize the many functions crucial to urban operations success regardless of mission. Discussions on days two and three provided many lessons that complemented and extended on material covered in the day one presentations. Some of these lessons are familiar. Others were once well known but later all but forgotten. Several are new. The following pages identify these lessons and provide evidence in support of their importance as provided by the highly qualified speakers evident in Appendix 1 (Conference Agenda). Appendices 2 (Speaker Biographies) and 3 (Presentation Abstracts) provide short synopses of presenter backgrounds and their briefings where available.

The second day of the 2010 conference at Latrun was notable for yet another hallmark occasion: the cornerstone laying for the headquarters of the Zvi Meitar Institute for Land Warfare Studies (ILWS).

2. Establishing the Continued Requirement for Proficiency in Urban Operations Maneuver

Commander of the Israel Defense Forces (IDF) Ground Forces Command (GFC) Major General Sami Turgeman and Professor Arnon Soffer opened the final two days of the conference, widening the scope of discussion to encompass all facets of combat in urban environments. Professor Soffer reminded the audience that avoiding the worst of urban combat remained a potential course of action, one in part demonstrated during Operation Cast Lead (OCL, conducted from December 2008-January 2009) as IDF personnel deliberately did not “take the bait” offered by Hamas, which tried to draw Israeli ground forces into the densest portions of the Strip’s built-up areas. Soffer’s reminder is valuable. Though completely avoiding densely populated and limited line-of-sight environments will rarely be feasible when urban areas are in an area of operations, concluding that forces must be committed to urban combat should not be the default position. On occasion it may be possible to bypass given locales, containing any threats and dealing with them later as necessary. Alternatively, it may be feasible to avoid the worst of urban areas’ difficulties through appropriate choices of tactics, forces, and other operational variables as was done during Operation Cast Lead in which movement was used to turn many enemy fighters out of their positions, causing them to expose themselves to awaiting fire systems, an exemplary case of the symbiosis that characterizes maneuver at its best. It is vital, however, to ever keep in mind the welfare of noncombatants and the potential consequences of isolating and/or bypassing their habitats. While urban combat poses a significant threat to innocents within a built-up area, so too can contingencies in which civilians are left without the support of essential infrastructure such as water supply, power, or sewage treatment or when threat forces deliberately target residents. Any decision – to include encouraging noncombatants to evacuate urban areas as was done in Tyre, Lebanon and Fallujah, Iraq – will have media and public affairs consequences that will have to be considered as part of a well-conceived course of action analysis.



Lesson

Though completely avoiding densely populated and limited line-of-sight environments will rarely be feasible when urban areas are in an area of operations, concluding that forces must be committed to urban combat should not be the default position. It may be possible to bypass given locales, isolating the threats within and dealing with them later as necessary. Alternatively, it may be feasible to avoid the worst of urban areas' difficulties through appropriate choices of tactics, forces, and other operational variables.

Major General (MG) Turgeman followed Soffer to the podium, providing a historical overview of the IDF's urban-related challenges since his country's 1948 inception. The sampling of case studies included the following cities and the approach taken. The civilian populations of the cities involved appear in parentheses.

- 1948: Operation Dani, the encirclement and isolation of Lod and Ramleh followed by an armor assault (50,000-70,000)
- 1956: Gaza, operational isolation and seizure of key terrain (120,000)
- 1967 Six Day War: Jerusalem, envelopment and phased occupation (60,000)
- 1973 Yom Kippur War: Suez City, combined arms attack on key terrain (250,000 pre-conflict, most of whom departed before the fighting)
- 1982 First Lebanon War:
- Tyre, encirclement and isolation (70,000)
- Beirut, encirclement, defense of an outer perimeter, and “systematic biting” (365,000)
- 2002 Operation Defensive Shield: Nablus, Jenin, and Hebron, raids and deliberate attacks (100,000s)
- 2008-2009 Operation Cast Lead: attack along multiple axes while avoiding the Gaza city center (700,000)

It is readily apparent that Israel – as was the case with coalition nations in the Balkans, Iraq, Afghanistan, and elsewhere in recent years – can expect to confront a spectrum of future urban environments and challenges ranging from densely populated inner cities; villages separated by considerable stretches of rural terrain; conventional urban defenses manned by fighters practicing irregular warfare tactics; and missions demanding the orchestration of armor-heavy operations, dismounted

infantry assaults, air attack, and more. For MG Turgeman the resulting requirements include timely intelligence allowing for rapid location of enemy forces, responsive maneuver capabilities able to concentrate both manpower and fires to engage threats, leaders and decentralized command and control processes able to adapt to the unexpected, and survivable force structures. That intelligence, those forces, and their leaders would also ideally be capable of controlling populations in order to minimize noncombatant casualties and civilian interference with combat operations. Together, General Turgeman concluded, these requirements point to the need for truly comprehensive campaign plans, ones integrating nongovernmental organizations, intergovernmental resources such as those provided by the United Nations, and nonlethal weapons. Consideration of recent history and the general's observations suggests that these campaign plans must encompass activities from preparations before that start of operations and continue beyond actions on the objective to include such issues as capacity building and disarmament, demobilization, and reintegration (DDR) initiatives. This extension will demand an understanding of an urban area's links to its surrounding region and beyond. Many of the tasks inherent in this wide spectrum of requirements remain but little covered in doctrine. Accomplishing them continues to be more art than science. Guidance, training, and refinement of approaches as lessons are learned will be necessary in order to properly synchronize military and non-military resources in the service of participants' objectives. Those participants will include military and civilian personnel representing government and other organizations if the undertaking is truly a comprehensive one.



Lesson

Today's urban operations demand truly comprehensive campaign plans, ones integrating nongovernmental organizations, intergovernmental resources such as those provided by the United Nations, other-than-government capabilities, and greater interweaving of nonlethal approaches.¹ Such plans must span the entirety of the operations involved, from preparations before initiation to beyond actions on the objective and include such issues as capacity building and disarmament, demobilization, and reintegration (DDR) initiatives.

1. "Nonlethal approaches" should be understood to include more than technologies. Influence operations, negotiation, civil support, demonstrations of force without inflicting casualties, and any action employed in the service of objectives other than those with the objective of killing the adversary would qualify in this regard.

3. Meeting the Demands of 21st-Century Urban Operations

Timothy L. Thomas followed the introductory speakers with the first of several historical case study analyses. He looked first at the mid-1990s Russian failure to initially seize Grozny, capital of Chechnya, as a source of cautions for any military contemplating an urban undertaking without thorough preparation and understanding of its complexity. (See Figure 3-1 for a map showing the location of Grozny.) The first Russian attempt reflected too little understanding in this regard...or neglect despite knowledge. Leaders underestimated the capabilities of the irregular Chechen force. They similarly failed to train their soldiers to deal with an environment in which many of the foe spoke Russian, employed ruses such as wearing Russian uniforms, practiced effective psychological operations, and demonstrated great skill in manipulating information to promote the insurgent cause. Expecting it would be but a short battle to take the capital, Russian planners did not adequately prepare their own information operations campaign or the logistical capabilities necessary to sustain extended actions in the city. In short, they did not prepare, train for, or resource operations to meet the demands inherent in campaigns such as those described by General Turgeman.

The Russians did, however, adapt after failing in the 1994-1995 phase of the war. Their return in 1999 saw a repeat of their rebuff in Grozny at the start of the second campaign, but on this occasion theirs was a force better prepared to pull back, reevaluate, and bring new capabilities to bear. Mr. Thomas described how a second, more deliberate effort followed the failed urban coup d’ main of 1999. Reconnaissance units infiltrated the city to take up positions and call for fires when they detected insurgent elements. Four battalions of snipers complemented this artillery and air support, thereby giving Russian leaders both blunt instruments and a rapier for excising the enemy from within Grozny’s many buildings and subterranean hiding places. Unlike during earlier failures, the attackers maintained consistent pressure, denying their adversaries the luxury of fighting by day and sleeping once the sun set as they had in the first campaign.

The city as a whole was divided into 16 subsections, a “spider web” approach that isolated geographic areas and entrapped the five to six man Chechen tactical units that formed the core of the defenders’ force. Russian units employed new weapons systems adopted in light of lessons learned from fighting in Chechnya’s

towns and cities five years before. Machine guns were lighter and far more compact. Shotguns were added to assist in close quarters combat and breaching. Ground forces employed both shoulder-fired and larger thermobaric rocket systems to collapse rooms or buildings providing cover to Chechen fighters.



Figure 3-1: Location of Grozny, Capital of Chechnya⁴

4 Map image from "Chechnya(Chechen Republic) Maps," Perry-Castaneda Library Map Collection provided courtesy of the University of Texas Libraries, The University of Texas at Austin, http://www.lib.utexas.edu/maps/commonwealth/chechnya_rel01.jpg (accessed November 2, 2010).

Tank rounds were redesigned or replaced with others that did not ricochet off walls as had occurred in 1994 and the following year. In 1999 the Russians were ready to fight in Grozny’s three dimensions – above, below, and at ground level. They also sought to control “key mental terrain,” using psychological and other information operation components to advantage.



Lesson

One size does not fit all during urban operations. Having failed with their 1994 and 1999 “thunder run” penetration attacks to seize Grozny, Russian forces pulled back and conducted an attack more reminiscent of German World War I Hutier infiltration tactics to take the capital. The attackers thereby demonstrated an ability to adapt operationally, tactically, and logistically. Western nations should seek to improve their urban operations training for operational-level commanders and staff the better to not replicate the mistakes made by Russian leaders. They should, however, attempt to replicate the timely adaptations those leaders made in the short period between the First and Second Chechen Wars, e.g., introduction of personal equipment and weapons systems better suited to field conditions when earlier capabilities were found wanting.

The Chechens failed to show the same initiative, relying on the same tactics that had earlier brought them success. Only in the realm of information operations did they truly compete effectively. Internet initiatives solicited funds from potentially sympathetic audiences, to include members of the Chechen diaspora worldwide. Messages sought to draw parallels between the besieged in Grozny and Palestinians in Gaza and the West Bank. Successes in the information operations arena could not compensate for tactical failure, however. Russian forces’ pressure, firepower, and guile forced Grozny’s defenders to flee.

While there is much to learn from both Russian failures and successes in Grozny, Mr. Thomas reminded his audience that Russian ruthlessness played a significant role in the ultimate outcome. The virtually unconstrained application of firepower in taking Grozny left the city devastated and caused a degree of noncombatant suffering many nations’ citizens, soldiers, and governments would find unacceptable. Such concerns should by no means preclude the use of might to achieve objectives during urban operations, but they provide a warning that pre-operation analysis will have to consider a much more extensive set of possible consequences than those tactical alone.

Major General (IDF, retired) Yizhak Mordechai's presentation came on the heels of that by Thomas. General Mordechai provided an analysis of urban operations involving the Lebanese cities of Tyre and Sidon, operations with which he was intimately familiar given his status as division commander of the unit conducting both in 1982. (See Figure 3-2; the cities are on the coast at the lower left.) The sequencing of presentations

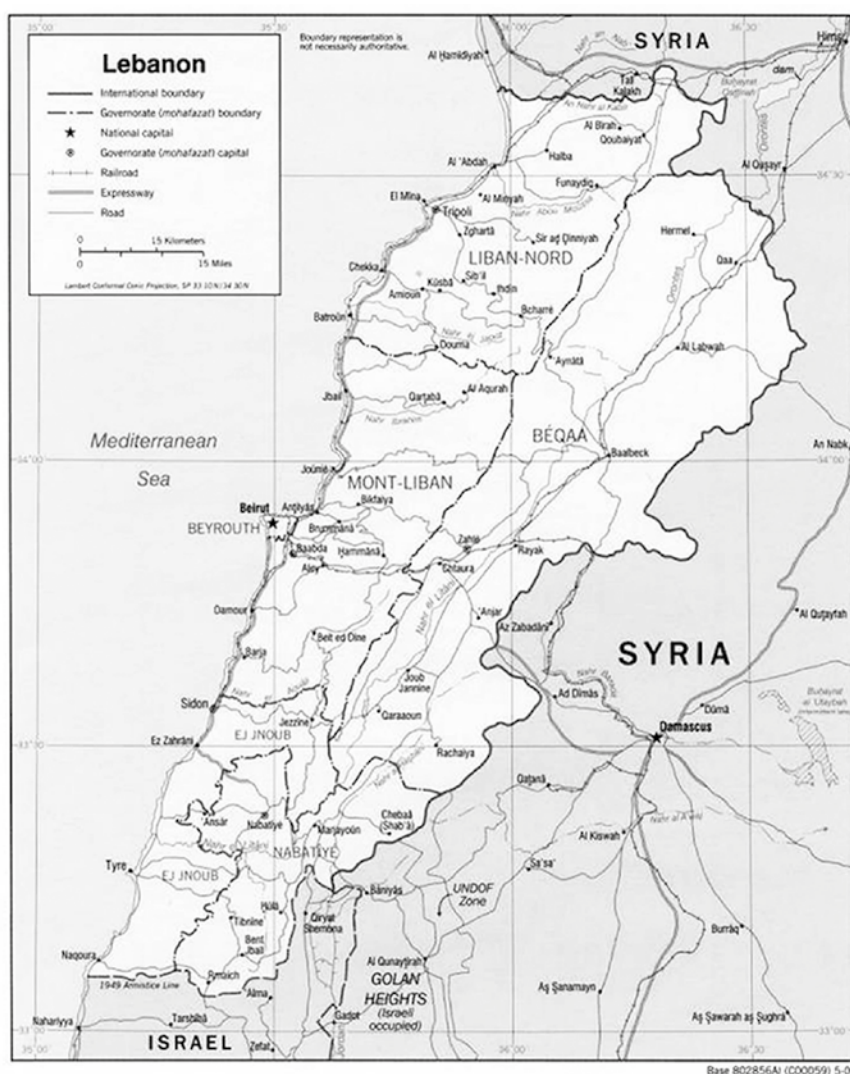


Figure 3-2: Cities of Sidon and Tyre in Southern Lebanon⁵

5 Map courtesy of University of Texas Perry-Castaneda Library Map Collection, "Lebanon Maps," http://www.lib.utexas.edu/maps/middle_east_and_asia/lebanon_pol_2002.jpg (accessed November 23, 2010).

immediately brought to the fore the realization that while noncombatants are more often than not a major component of urban undertakings, their influence can be mitigated to some extent when conditions allow. Whether forced out by fear (as was the case with the many who fled Suez City, Egypt in 1973; Kafji, Saudi Arabia; or Grozny in the campaigns just described) or encouraged to leave prior to an attacker’s beginning its assault (Fallujah, Iraq in November 2004; Tyre and Sidon in Lebanon), civilians are less of a constraining influence in more cases than might at first be thought. Akin to moving Malaysians of Chinese decent into “New Villages” during operations in that post-World War II British colony, the absence of large numbers of noncombatants – or their being limited to monitored locations – both reduces the support they might provide to an enemy and the interference their presence inherently constitutes for nations concerned with casualties among the innocent. MG Mordechai’s observations also highlighted the value of traditional techniques for taking urban objectives. Israeli forces sought to isolate both Tyre and Sidon from reinforcement by land and water. They also recognized the value of relying on more than force alone in the service of mission accomplishment; the departure of civilians from both cities was secured via negotiations conducted prior to subsequent attacks seeking to eliminate the enemy remaining within their confines.



Lesson

The dramatic growth of cities worldwide should not rule out consideration of historically proven approaches to urban operations. Evacuating noncombatants, isolating an urban objective, and communication with power brokers are but three recently demonstrated, longstanding techniques that have proven successful in the past and will likely again prove feasible in the future. Adaptation may allow for their use in new, innovative ways as well, for example by isolating and evacuating civilians from selected neighborhoods of cities too large for application of such actions on the whole of the urban area.

General Mordechai’s Israeli colleague Colonel (IDF, retired) Bennie Michelson addressed a later stage of 1982 operations in Lebanon, that involving activities in the vicinity of Beirut. The comparison of urban operations north and south is an interesting one; the size of Beirut in terms of size of population and geographical expanse made complete isolation and population evacuation a practical impossibility. Colonel Michelson emphasized the need to create professional research teams to

study potential city objectives in great detail, not only immediately prior to military operations but, ideally, for years beforehand. The complexity of urban systems demands inclusion of civilian experts familiar with water, electrical, political, and the many other physical and social subsystems inherent in the infrastructures of such urban areas. Unlike the approaches employed in taking the two smaller cities to the south, Michelson described how the IDF, like a concert pianist, sought to “play” on infrastructure systems in order to achieve campaign objectives in Beirut. By so doing the Israelis again found means other than the direct application of force to influence the population in ways supportive of mission accomplishment.



Lesson

The complexity of today’s cities suggests that it is advisable to conduct long-term, multidisciplinary studies of select urban areas deemed of likely future operational importance.

Colonel (U.S. Army) Wayne W. Grigsby’s remarks based on his experience as a brigade commander in Baghdad, Iraq reinforced Colonel Michelson’s recommendation regarding the need to bring a wide range of experts together when readying for urban operations. In Colonel Grigsby’s view, “Partnership is key to a successful comprehensive approach.” Partners in planning, execution, and post-operation identification of doctrinal and other lessons include multinational military partners (to include the host nation), other-than-armed forces governmental agencies, and the nongovernmental, intergovernmental, and commercial participants identified or implied in MG Turgeman’s similar call for multi-party participation. Grigsby particularly stressed the essentiality of early and continued interaction with host nation representatives from any and all relevant groups. Their representatives alone can provide the depth of understanding needed to comprehend both security and broader needs, thereby establishing a foundation for effective friendly force use of resources – military, economic, and otherwise. Involving local leaders and citizens further supports the long-term goal of communities assuming responsibility for self-government and establishing a viable economy by gaining their “buy in” and providing them a vested interest in ongoing initiatives. Colonel Grigsby also recognized this interface as an expanded form of intelligence collection. It potentially addresses all lines of operation (LOO) relevant to eventual campaign success. His belief that the security LOO may not be that of greatest importance was reinforced by his remark that – ultimately – the host nation’s police are more important to a country’s establishment of day-to-day security and maintenance of normalcy than is

its military. It is a proposition supported by urban and counterinsurgency operations in Northern Ireland and Solomon Islands, both of which saw police primacy and armed forces in a supporting role as stability gained a firm foothold.⁶



Lesson

Partnership with indigenous representatives is fundamental to eventual success during urban counterinsurgency operations. The contact inherent in developing these partnerships has the immediate benefit of providing “an expanded form of intelligence” beyond that focusing only on threat capabilities and intentions.

Lieutenant Colonel (LTC) John S. Nelson, recently returned as commander of a cavalry squadron on operations in western Iraq and having previously served as a S3 for a brigade combat team (BCT) in Baghdad, reinforced Colonel Grigsby’s call to establish ties with local populations, other nations’ militaries, and civilian agencies in order to better inform prioritization of effort and resource allocation during operations in densely populated areas. Nelson emphasized the importance of understanding local conditions given the potential for disconnects between situations at the tactical level and higher echelon perceptions of that ground truth. He recalled his time in Baghdad, one in which some at higher headquarters viewed resistance to the Iraqi government as stemming exclusively from fundamentalist elements. That understanding of the situation failed to coincide with BCT observations that college professors and other members of the Sunni elite who would normally be expected not to champion introduction of *sharia* law were nonetheless underpinning insurgent activity. Interaction with Sunnis in their area of operations allowed members of the command to determine that the unexpected – but nevertheless dangerous – relationship was the result of U.S. and Iraqi government failures to secure Sunni communities from Shia assaults. The BCT responded by increasing neighborhood patrols and installing forces in local outposts to fill the gap, thereby undermining much of the Sunni support for the insurgents. The improved relations also resulted

6 The following are among the sources available for those interested in reading more on these two contingencies: Northern Ireland: *Operation Banner: An Analysis of Military Operations in Northern Ireland*, Chief of the [British] General Staff, Army Code 71842, July 2006; and Tony Geraghty, *The Irish War*, London: HarperCollins, 2000.
Solomon Islands: Russell W. Glenn, *Counterinsurgency in a Test Tube: Analyzing the Success of the Regional Assistance Mission to Solomon Islands (RAMSI)*, Santa Monica, Calif.: RAND Corporation, 2007, <http://www.rand.org/pubs/monographs/MG551/> (accessed October 27, 2010).

in passage of critical intelligence that in some instances allowed the Americans to eliminate Sunni extremist cells altogether. In short, the brigade combat team's analysis of threat motivations in western Baghdad determined them to be far more heterogeneous than as perceived by some at higher echelons.



Lesson

Be alert for disconnects between higher echelon perceptions and reality on the ground. Higher headquarters may fail to discriminate between the many interests, parties, and threat types evident to those conducting effective information collection and analysis at lower levels during urban operations.

Discovering these nuances was particularly difficult at first given the limited willingness of Iraqis to come forward with information. Signals intelligence (SIGINT), imagery intelligence (IMINT), and other more technology-oriented means of collection were the BCT's primary sources due to the initial lack of reliable information offered by the local population. Nelson recalled the development of an interesting phenomenon as time passed and some measure of trust was gained with local residents. The value of the information gained through human intelligence (HUMINT) sources became notably better than that gained via other collection methods that relied on technology, but the process of gathering through patrolling, interacting at vehicle control points, or otherwise communicating with Iraqi civilians meant incoming information arrived more slowly and took longer to process. The ways in which material was gathered dictated decentralized collection and analysis as well as flexibility in processing and distribution. Lower echelon unit leaders had to not only pass information up for further analysis; some degree of immediate processing and decisions regarding what to disseminate laterally to other units at the same tactical level or below were also called for.

The great variety of information needed – that pertaining to the civilian population as well as the traditional demand for understanding the physical terrain, weather, and threat capabilities and intentions – combined with the complexity of the urban environment to make management of intelligence operations extraordinarily difficult. LTC Nelson offered several keys to promoting successful orchestration of the process:

- Employ the targeting process to guide intelligence processing and dissemination and assist in prioritizing allocation of available resources.

- Use a coherent written order to guide all aspects of the command’s intelligence operations.
- Include joint and interagency representatives at lower levels than has historically been the case.
- Likewise, bring liaison officers (LNOs) from the host nation onto your intelligence team and integrate them in command planning processes while vetting them from a counterintelligence perspective.
- Employ company intelligence support teams (COIST), thus providing intelligence management and analysis capabilities to lower echelons.
- Encourage company commanders to make their own assessments of what is ongoing on at the ground level. They are often more familiar with local conditions than those at higher echelons who are farther removed.
- Use redundant means of collection to verify, key, or otherwise support HUMINT, e.g., unmanned aerial vehicles (UAV).
- Make connections with the population through organizations and not just individuals. Nelson applied lessons learned in this regard during his later tour as squadron commander in western Iraq, dealing with agricultural groups as a means of offering out-of-work farmers jobs so that the temptation to support threat elements would be less.
- Exercise dynamic guidance to ensure intelligence requirements keep pace with mission demands.

Understanding the importance of HUMINT and the civilian population led Nelson to recognize that the terms key, decisive, and restrictive terrain took on expanded meanings during urban operations. While they might still involve a hill, intersection, or river crossing point, other such “features” might be infrastructural, social, economic, or political as well as topographical in character. He provided churches; mosques; religious, social, economic, and political leaders; police chiefs; Iraqi Army commanders; merchants; lines of communication; and high-rise buildings as examples.



Lesson

Collecting, verifying/validating, and processing HUMINT is more time consuming than similar processes for most other types of intelligence. This slowness and the complexity of urban areas can be overcome somewhat by decentralizing information processing and intelligence distribution decisions and providing well-conceived guidance for those conducting intelligence operations at lower echelons. That complexity and the enhanced role of the population as a key – if not decisive – element during urban operations likewise demands innovation in applying established doctrine, e.g., in identifying what qualifies as “key terrain.”

Colonel (IDF, retired) Reuven Erlich and Brigadier General (BG) Herzi Halevi both provided insights on Israel Defense Forces actions during the December 2008-January 2009 Operation Cast Lead (OCL) in Gaza. Ground operations focused on the northern portion of the Gaza Strip, an exceptionally densely populated area that included the city of Gaza. Concerns regarding noncombatants were exacerbated by the threat (Hamas) routinely using private homes and facilities beneath civilian structures normally proscribed for targeting (e.g., hospitals) as command and control facilities, weapons and munitions storage sites, or military positions.⁷ Israel initiated its ground campaign on January 3, 2009 after roughly a week of air

bombardment. Three of the four attacking brigades – the Paratroopers Brigade, Givati Brigade, and Golani Brigade – operated in and around Gaza City while the fourth, the Iron Tracks armored brigade, cut across Gaza to the south of the city, isolating operations from the southern Gaza Strip. (See Figure 3-3.) All four units operated with considerable autonomy. Attack helicopters supporting infantry units were under control of ground force commanders, a significant change from the Second Lebanon War in 2006 when Israeli Air Force rotary-wing assets remained firmly under air force supervision.

The Paratrooper Brigade task force attacked from the north along the Mediterranean coast. Its immediate objective was to prevent the firing of rockets from the area. To the south, the Givati Brigade task force began near the Karni crossing to penetrate

7 The descriptor “normally” is significant as such buildings, protected by international law or other ethical standards when free of threat presence, lose their protected status when a combatant employs them in ways that support its military objectives. Though attack is no longer be formally proscribed under such conditions, a commander may seek to avoid engagement or limit the damage done given the adverse publicity an attack can precipitate.

westward south of Gaza City while a task force built around the Golani Brigade struck toward the city from the northeast.⁸ The attackers avoided obvious avenues of approach and used UAVs to assist commanders in selecting the most promising routes of advance. The army favored night operations, knowing that Qassam Brigade (the military arm of Hamas) and other forces that might be supporting Hamas were deficient in both night-vision systems and the training needed to effectively operate under conditions of limited visibility. Gaza City was soon cut off from the Gaza Strip's primary north-south highway.⁹

The avoidance of Gaza's densest urban areas and Qassam Brigade prepared positions in urban areas more generally – positions often in or in close proximity to civilian homes, mosques, or other structures proscribed from attack or possibly housing innocents – meant that there was a danger of the adversaries "passing like ships in the night," leaving the IDF's



Figure 3-3: Primary IDF Ground Force Attacks into Gaza¹⁰

- 8 Abe F. Marrero, "The Tactics of Operation CAST LEAD," in *Back to Basics: A Study of the Second Lebanon War and Operation CAST LEAD*, ed. Scott C. Farquhar, Fort Leavenworth, KS: Combat Studies Institute Press, 2009, p. 91.
- 9 Abe F. Marrero, "The Tactics of Operation CAST LEAD," in *Back to Basics: A Study of the Second Lebanon War and Operation CAST LEAD*, ed. Scott C. Farquhar, Fort Leavenworth, KS: Combat Studies Institute Press, 2009, p. 92.
- 10 Adapted from image in Abe F. Marrero, "The Tactics of Operation CAST LEAD," in *Back to Basics: A Study of the Second Lebanon War and Operation CAST LEAD*, ed. Scott C. Farquhar, Fort Leavenworth, KS: Combat Studies Institute Press, 2009, p. 92. Map from "Middle East: Gaza Strip," *The World Factbook*, Central Intelligence Agency, <https://www.cia.gov/library/publications/the-world-factbook/geos/gz.html> (accessed January 18, 2010).

enemy intact. BG Halevi described the resulting IDF solution as “the reversal of the relationship between fire power and movement in maneuver.” Halevi described fires as traditionally being used primarily in support of movement as an attacker conducts maneuver. With the enemy concealed in urban areas and using civilians or proscribed facilities as shields, however, it was necessary to turn the foe out of its prepared positions. Movement therefore became a tool for forcing Hamas fighters to leave cover, thereby exposing themselves to Israeli firepower. Halevi referred to a specific case in which an armor platoon moved along a stretch of Gaza beach. The movement – using an unexpected route – disrupted Qassam defensive plans, causing the Hamas fighters to attempt relocation to deal with the threat from the unforeseen direction. IDF helicopters swept in as the Hamas defenders converged on a mosque to resupply themselves with munitions, killing the majority of the 30 personnel spotted.



Lesson

The combination of cover, concealment, proscribed targets, and concerns regarding both friendly force and noncombatant casualties during urban operations suggests greater restraint in the use of firepower and the more frequent use of movement to force an enemy to relocate from prepared positions, thereby exposing itself to killing fires.

The Australian Army’s BG Mark Holmes described a considerably different urban environment, that as found in East Timor during the multinational operations in that country during later 1999. The capital of Dili was a particular focal point for violence; 50% of its residences were destroyed during the atrocities committed by Indonesian and Indonesian-supported soldiers. The Australian-led coalition sought to quickly make itself appear ubiquitous in the city and at other locations throughout the eastern end of the island. (See Figure 3-4 for a map of East Timor and its environs; East Timor is toward the bottom right of the map. Figure 3-5 is a map of East Timor.) Transition from combat to stability operations, to include population



Figure 3-4: East Timor and its Environs¹¹

control, quickly followed the September 15, 1999 arrival of the United Nations-authorized force. The Armed Forces for the National Liberation of East Timor (FALINTIL, based on an acronym drawn from the local designation) was the guerrilla force that had long championed East Timorese freedom and could have spurred a civil war had it been allowed to even accounts. Negotiation and FALINTIL cooperation resulted in these guerrillas agreeing to restrict themselves to their cantonments and not attack militants or withdrawing Indonesian forces, thereby negating any pretext for Indonesian re-intervention. The coalition turned to building institutional capacity in the aftermath of restoring stability.

11 Map source for region: "East & Southeast Asia: Indonesia, Central Intelligence Agency, November 9, 2010, <https://www.cia.gov/library/publications/the-world-factbook/geos/id.html> (accessed November 23, 2010).



Figure 3-5: East Timor¹²

It was during these later efforts that two issues in particular asserted themselves. First, officials heading the newly independent nation of East Timor sought to place many FALINTIL and other once-armed personnel in the nation's security forces. The United Nations (UN) offered that the fledgling nation did not need military forces. Solomon Islands provided an example in support of this position. The island nation – later beneficiary of the July 2003 multinational Regional Assistance Mission Solomon Islands – has no armed forces, relying instead on its police force. The result is a considerable savings in expense and – potentially – a reduction in the likelihood of coup-inspired unrest. Creation of an East Timorese armed forces was nonetheless undertaken, a decision that later precipitated turbulence when representatives from the eastern part of the nation felt themselves subjected to bias during formation of the army, turmoil that has caused Australia to back its guarantees.

of deploying forces in support of maintaining East Timor's stability by returning forces to Dili and elsewhere since their initial post-1999 departure.

12 Map source for East Timor: "East & Southeast Asia: Timor-Leste, Central Intelligence Agency, November 9, 2010, <https://www.cia.gov/library/publications/the-world-factbook/geos/tt.html> (accessed November 23, 2010).



Lesson

While demobilization, disarmament, and reintegration (DDR) programs are often highly desirable to assist in reducing the potential threat posed by former armed combatants, it does not follow that any or all of those undergoing DDR must go into the security sector.



Lesson

Counterinsurgency success is often a fragile accomplishment requiring long-term commitment of the counterinsurgent to its maintenance. As the case of East Timor demonstrates, deployments needed to maintain stability often focus on urban areas.

Mr. Ophir Shoham, Head of Israel’s Directorate of Defense Research and Development, reminded those listening of several longstanding urban challenges that continue to hinder modern forces’ effectiveness in urban environments. Reminding us that the accomplishments described by BG Halevi were far easier to describe in retrospect than initially accomplish, Shoham spoke of how difficult urban maneuver is from the perspective of both its movement and fires components. Narrow streets and barriers such as freestanding and building walls hamper efforts to maintain formation or move along other than canalized approaches. Developing a tandem warhead capable of penetrating walls from a standoff position is important from both the perspective of creating passageways for friendly force soldiers and killing adversaries behind such protection. Shoham suggested that there is a need for such a capability, one he thought should have a standoff range of 400 meters. Reinforcing the need to constantly retain a systems approach when contemplating urban challenges, Shoham went on to address the necessity of considering the weight and bulk carried by those soldiers who need to move through those passageways. (BG Moffid Ganem, the IDF’s Chief Logistics Officer, also emphasized the impact of equipment on individual maneuver during a later briefing.) Two other longtime urban maneuver challenges cited by Shoham were the need for precise navigation in an environment where the matter of a few meters can put a unit in the wrong building or alleyway and the continuing lapse between detecting a target and being able to accurately engage it with air or other systems suitable to the tactical situation and

rules of engagement. Subsequent speakers expanded on Mr. Shoham's list of urban challenges. BG Ganem told of logistics force struggles to deal with the competing requirements of meeting the needs of both IDF units and those of urban civilian populations often suffering the consequences of fighting. Professor Asa Kasher of Tel Aviv University spoke of the tension between maintaining noncombatant safety and the survival of the soldiers tasked with clearing rooms, one of combat's most dangerous tasks. He reemphasized the necessity for developing and fielding more effective nonlethal capabilities so that such undertakings do not inevitably devolve to an either-one-or-the-other decision.



Lesson

Regardless of the improvements made as a result of recent urban operations in southern Lebanon, Iraq, the Occupied Territories, Afghanistan, or elsewhere, many of the same problems that have historically degraded operational effectiveness have yet to be addressed satisfactorily.

Dr. David Johnson of RAND lent credence to Shoham's concerns pertaining to the timeliness of air support, explaining that air power is a crucial enabler for ground operations in built-up areas. His description of U.S. forces fighting in Baghdad's Sadr City recalled earlier presentations by Timothy Thomas and BG Halevi. He spoke of American soldiers forcing the foe from their prepared positions to gain separation between the noncombatant population the attackers wanted to protect and the insurgents they sought to kill. As in Grozny, snipers played a key role, as did heavy vehicles such as tanks and infantry fighting vehicles when they were used in a manner taking advantage of their survivability.

Ms. Sheera Frenkel, correspondent for several major newspapers and media organizations, kindly stepped forward when Mr. Conny Mus, a noted Middle Eastern correspondent for 27 years, tragically passed away after accepting a speaking invitation to address the relationship between the armed forces and media representatives. Ms. Frenkel assumed the challenge nobly, calling on the IDF to back its claims of having the most moral armed forces in the world with a willingness to allow the press to more closely observe Israeli military operations during conflicts. Her call, controversial in a forum where some are yet coming to grips with what defines an appropriate military-media relationship, spurred several interesting questions. Her presence at the conference served the vital purpose of expanding listener awareness while also demonstrating the desire of the Institute

for Land Warfare Studies to take on difficult international security challenges in the moral and ethical realms in addition to spurring debate on more conventional topics.



Lesson

Military-media relations remain a work in progress for parties in both groups. Media representatives in many cases failed to adequately maintain their objectivity during the 2006 Second Lebanon War, de facto permitting Hezbollah to censor outgoing products. The Israeli government's policies during Operation Cast Lead (OCL) two years later perhaps in part reflected a concern that the international media had not been neutral in that earlier conflict. The severe restrictions placed on correspondents during OCL, however, ultimately worked to Israel's disadvantage. Relevant publics were poorly informed. Media representatives were effectively barred from the operational area and thus could not adequately determine ground truth. The IDF later found it had few disinterested witnesses able to support the Israeli military's responses to pointed accusations published in the Goldstone Report.

The presentation by MG (IDF, retired) Amos Yaron (division commander during operations in 1982 Lebanon) and the second by LTG Metz (his first being that regarding IEDs on the opening day of the conference) effectively provided overarching coverage of many points discussed in the previous pages. General Yaron's description of fire support during IDF action in and around Beirut included recognition of the impact of ethical judgments and related public expectations regarding actions in the field. Ethics is an increasingly influential lens for viewing military and their nation state governments' performances. It might be fair to observe that victory in the form of persevering over an adversary on the battlefield is no longer the preeminent metric of success if noncombatant concerns are too greatly neglected. Though not overtly addressed during Yaron's analysis, it may be similarly fair to observe that nation states are held to a higher standard of conduct than non-state actors, that regardless of the fairness of such unbalanced evaluations. Hezbollah in 2006 and Hamas during OCL both deliberately put civilians in harm's way and used facilities such as hospitals, mosques, and other proscribed structures for military purposes, just as do insurgents in Iraq. Public – and media – outcry is restrained in comparison to that directed at state actors. Equitable or not, it is a condition of today's conflict environment, a situation that lends further importance to the establishment of better

understanding between military and media representatives as suggested during Ms. Frenkel's stint at the Latrun podium.



Lesson

State actors are held to a higher standard of behavior during conflicts than non-state combatants. The resulting expectations can have consequences directly impacting political decision makers and operations in the field. One possible means of in part addressing the imbalance may be for both media and military representatives to cultivate greater mutual understanding.

General Metz's observations on coalition operations in November 2004 Fallujah ranged widely, covering technologies, tactics, influence operations, media, political impact on tactical operations, and other matters. Comments included those of pragmatic consequence at the lowest echelons. One example: the observation that equipping vehicles with independent sights as is done for the commander and driver of the U.S. M1 Abrams tank gives crews a significantly increased level of security in restricted urban terrain. He reinforced the use of snipers as an effective means for blinding an urban-based enemy, particularly when the sharpshooters are targeting an adversary's observation posts. The importance of seizing and holding the moral high ground directly influenced the sequencing of operations in Fallujah, as did putting the legitimacy of host nation capabilities squarely in the public's eye. Metz cited the example of designating a well-known hospital in the city as an initial tactical objective. Taking control of the medical facility was given to an Iraqi Army unit, 36 Commando. Success in taking the hospital demonstrated the capabilities of the commando unit, a representative of the government the coalition sought to bolster in the eyes of its electorate. It simultaneously addressed public affairs requirements by showing coalition concern for providing local residents with medical treatment and neutralizing accusations of coalition atrocities originating from the hospital's staff. It was, in Thomas's words from his lecture on Grozny, seizure of "key mental terrain," a significant step forward in the important psychological arena. No less important to success, especially so in light of Baghdad politicians' earlier pressures to cease the successful offensive in Fallujah in 2004: Iraq's prime minister publicly supported the November attack by announcing that anyone driving a vehicle or carrying a weapon within the confines of the city would be considered a legitimate coalition target. General Metz further emphasized the importance of the information

domain with several additional key insights employed during Operation Phantom Fury, the November 2004 Fallujah operation, a number of which are depicted visually in Figure 3-6 and articulated in the lessons below the diagram. (Note: The "information operation threshold" as shown in the figure reflects the boundary above which an event is likely to gain significant attention from media representatives).

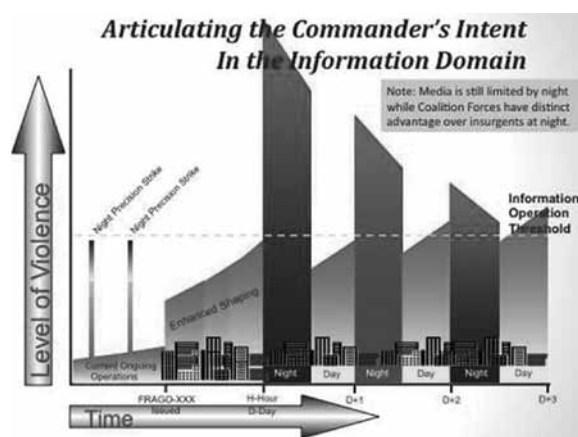


Figure 3-6: Influence Operations and the Media Threshold during Operation Phantom Fury



Figure 3-7: Example of a Coalition Information Summary Provided to Media Representatives during Operation Phantom Fury



Lessons

Considering staying below the media “information operation threshold” before H-hour, D-day so as to minimize the likelihood of preliminary adverse publicity.

• • •

Similarly contemplate breaching the information operation threshold only at night when media is less capable of monitoring operations. This was particularly important during operations in November 2004 Fallujah given that some media representatives had previously demonstrated an anti-coalition bias.

• • •

Plan for and take appropriate action in terms of tactics and media information initiatives for cases of the enemy sacrificing the sanctity of protected facilities such as mosques. Minimize the damage to such structures even when the behavior of the enemy makes them legitimate targets, e.g., removing only the tops of mosque minarets used by snipers rather than destroying the entire structure.

• • •

Provide media representatives information packages explaining recent and ongoing operations. (See Figure 3-7 for an exemplar.)

• • •

Admit that, “We’re not perfect.” If an incorrect story gets out, correct it.

4. Conclusion

The 2010 Institute for Land Warfare Studies “Fighting in Urban Terrain” conference described in the previous pages focused primarily on the challenges associated with combat in densely populated environments similarly packed with manmade structures. More subtly, the event could be considered an extension of sorts from that held at Latrun two years previously and entitled “Land Maneuver in the 21st Century.” The 2010 recurring theme of orchestrating resources beyond those purely military was very much a centerpiece those in 2008 would have recognized. It is worth considering the debate regarding the character of maneuver found in the proceedings from that previous year’s event.¹³ Discussion during 2008 pivoted about the definition and fundamental character of “maneuver,” defined variously in national military doctrines as follows:

- **U.S. Definition:** “Employment of forces in the operational area through movement in combination with fires to achieve a position of advantage in respect to the enemy in order to accomplish the mission”¹⁴
- **Israeli Definition:** “The combination of force movement and fires with the objective of gaining an advantage over the enemy...”¹⁵
- **Australian Definition:** “The Manoeuvre Battlespace Operating System (BOS) orchestrates the means of prosecuting close combat and concentrating sufficient force at the decisive point to achieve surprise, psychological shock and physical momentum.”¹⁶
- **British Definition:** “Manoeuvre is the means of concentrating force or the threat of force at decisive points to achieve surprise, shock and opportunities for exploitation. It has both spatial and temporal dimensions which can be exploited to keep the enemy off balance...”¹⁷
- **Canadian Definition:** “Employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of

13 The document is available for free download at <http://www.ilws.org.il/eng/ListPages.aspx?catid=65>.

14 *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02, Washington, D.C.: Joint Chiefs of Staff, April 12, 2001 as amended through May 30, 2008, p. 324.

15 Brigadier General (IDF, retired) Gideon Avidor provided this definition.

16 *Land Warfare Doctrine 1: The Fundamentals of Land Warfare (LWD 1)*, Australian Army, 2008, p. 83. Thanks to Colonel Chris Field, Australian Army, for forwarding the definition.

17 The British definition is from *Land Operations*, British Army Doctrinal Publication, May 2005, Para 0306. David Russell-Parsons (Lt Col, British Army) email to Russell W. Glenn, Subject: Manoeuvre, August 5, 2008.

advantage in respect to the enemy in order to accomplish the mission.”¹⁸

It is readily evident that all of the above overtly or inherently share the common characteristics of employing *force* (or forces) to gain or maintain some form of *advantage* with respect to an *enemy*. Some at Latrun in 2008 proposed that while these components of maneuver were unquestionably still applicable, they were no longer sufficient for the challenges confronted in today’s operational environments.

We must heed calls for a comprehensive approach as called for by MG Turgeman if we accept that bringing to bear more than military capabilities is fundamental to most operations today. This broader set of capabilities is nowhere more important than in urban environments. First, mission success will often depend on far more than “movement,” “fires,” or other forms of influence possessed by military organizations alone. Second, accomplishing desired ends may only in part involve overcoming enemy resistance. There may well be deployments or missions within deployments where no enemy exists or an armed threat is peripheral to achieving desired ends. Those favoring a broader definition of maneuver in 2008 therefore sought one that would delimit the means available to favorably influence events and similarly expand recognition of the parties that could be influenced by use of those means. The result was the following alternative offered as a new definition for maneuver:

The employment of relevant resources to gain advantage with respect to selected individuals or groups in the service of achieving specified objectives.¹⁹

Whether today’s operational challenges merit expanding the longstanding understanding of maneuver is left to further debate beyond the bounds of Latrun. What is evident is that urban combat and operations in urban environments more generally continue to task the best of 21st-century militaries and the sharpest of minds. The presentations and accompanying discussions from the early October conference at Latrun both reinforced knowledge of these operations’ complexity and offered new insights. Any persons knowledgeable with regard to modern armed forces capabilities understand that the several lessons identified in the pages above both (1) represent reminders that former challenges remain even as they evolve and (2) find company with others that are new. It is hoped that similarly old relationships renewed during this conference and those newly initiated in 2010 at Latrun planted seeds of common interest in finding solutions.

18 This Canadian definition is in keeping with Allied Administrative Publication 6, *NATO Glossary of Terms and Definitions*. David Lambert (LCol, Canadian Army) email to Russell W. Glenn, Subject: Definition, August 3, 2008.

19 Russell W. Glenn, *Questioning a Deity: A Contemplation of Maneuver Motivated by the 2008 Israeli Armor Corps Association “Land Maneuver in the 21st Century” Conference*, Latrun, Israel: Israeli Armor Corps Association, November 2008, p. 24.

Appendix 1: Conference Agenda

Tuesday, October 5, 2010	Force Protection
Welcome	MG (IDF, retired) Chayim Erez (Chairman, Israeli Armor Corps Association) and BG (retired) Shemaya Avieli (Director, SIBAT)
Defeating the IED as a Weapon of Strategic Influence	LTG (U.S. Army, retired) Thomas F. Metz (Former Director of Joint IED Defeat Organization, U.S. Army)
Merkava Protection Program Development	Col (IDF) Baruch Mazliach (Head of Merkava Production Program)
Industry Display	
Wednesday, October 6, 2010	Combat in Urban Terrain I
Morning Session	Seizing a City
Welcome	Mr. Zvi Meitar (President of the Zvi Meitar Institute for Land Warfare Studies) and MG (retired) Chayim Erez (Chairman, Israeli Armor Corps Association)
The Modern City and Urban Warfare	Professor Arnon Soffer (Head, National Defense College Research Center)
The City as an Operational Challenge	Major General (IDF) Sami Turgeman (Commanding General, IDF Ground Forces Command)
Employing a Penetration Attack to Capture an Urban Area: Case Study Grozny	Mr. Timothy L. Thomas (U.S. Army Foreign Military Studies Office)
Siege and Frontal Attack in the Urban Offensive: The Case of Tyre in Lebanon (1982)	MG. (IDF, retired) Yizhak Mordechai (Division commander during the operation)
Employing Nonlinear Operations to Control a City – The Case of Bagdad (2004)	Colonel (U.S. Army) Wayne W. Grigsby (Director, U.S. Army School of Advanced Military Studies)
Afternoon Session	Intelligence and Information Operations in Support of Urban Combat
Developing an Urban Database in Support of Military Operations –1982 Beirut	COL (IDF, retired) Bennie Michelson (Chairman, The Israeli Association for Military History)
Synchronizing Intelligence and Maneuver in Support of Urban Combat – Bagdad	LTC (U.S. Army) John S. Nelson (Commander, 1st Battalion, 4th U.S. Cavalry Regiment)
"Know Your Enemy: The Irregular Threat and Urban Combat:" Operation Cast Lead, Gaza 2009	Dr. Colonel (IDF, retired) Reuven Erlich (Head of the Intelligence and Terrorism Information Center)
Role Changing: From Combat to Population Control – East Timor Case	BG (Australian Army) Mark Holmes (Commander, Land Warfare Development Centre)

Thursday, October 7, 2010	
Combat in Urban Terrain II	
Morning Session	Fire Support during Urban Operations
Close Fire Support during Urban Combat: Gaza, 2009	BG (IDF) Herzi Halevi (Commander, Paratroopers Brigade during Operation Cast Lead)
Fires as the Decisive Element during Urban Combat: 1982 Beirut	MG (IDF, retired) Amos Yaron (Division commander during the operation)
Fire in Support of Maneuver: The Case of November 2004 Fallujah	LTG (U.S. Army, retired) Thomas F. Metz (Former U.S. Army Training and Doctrine Command Deputy Commanding General and Chief of Staff)
Technological Developments in Support of Urban Combat	Mr. Ophir Shoham (Head, Directorate of Defense R&D)
Laying of Zvi Meitar Institute for Land Warfare Studies Foundation Stone	
Afternoon Session	International Law and Ethical Responsibility during Urban Combat
Logistics in Support of Combat and Humanitarian Assistance Operations during Urban Operations	BG (IDF) Moffid Ganem (IDF Chief Logistics Officer)
The Evolving Roles of Ground Power and Air Power Across the Range of Military Operations	Dr. David E. Johnson (RAND Corporation)
The Code of Ethics during Fighting in Urban Terrain	Professor Asa Kasher (Tel Aviv University)
The Role of the International Media	Ms. Sheera Frenkel [Journalist for The (London) Times and other publications]
Closing Remarks	

Appendix 2: Speaker Biographical Sketches

Dr. Colonel (IDF, retired) Reuven Erlich



Dr. Reuven Erlich (Avi-Ran) was born in Poland on April 28, 1946. He served in the IDF Intelligence Corps, mainly as an analyst specializing Syrian, Lebanese, and Palestinian affairs. He retired in 1994 with the rank of colonel after 30 years of service in staff and operational duties. Between 1985 and 2000 he served as deputy to Ambassador Uri Lubrani, Israel's government coordinator for Lebanese affairs. Between 1991 and 1993 he was a member of the Israeli delegation to the Israeli-Lebanese peace negotiations in Washington. Dr. Erlich also focused on Syrian-Lebanese issues in his academic studies. In 1998 he was awarded a Ph.D. degree from Tel Aviv University for his dissertation on "The Policy of the Zionist Movement and the State of Israel toward Lebanon (1919-1958)." He has published five books and many articles dealing with those subjects, including a book published in the United States under the name Reuven Avi-Ran called *The Syrian Involvement in Lebanon since 1975* (Westview Press, 1991). Dr. Erlich's current duties include service as Head of the Intelligence and Terrorism Information Center at the Center for Special Studies and lecturer on intelligence and head of intelligence studies at the Lauder School of Government at the Interdisciplinary Center, Herzliya.

Ms. Sheera Frenkel



Sheera Frenkel is a highly regarded correspondent whose work appears in *The (London) Times* and numerous other publications. She also works with National Public Radio in the United States. A finalist for Amnesty International's "Reporter of the Year" award, Ms. Frenkel was chosen a 2010 "Young Journalist of the Year" by members of the British Press.

Colonel (U.S. Army) Wayne W. Grigsby, Jr.



Col. Grigsby began his career at Fort Clayton, Panama. Following graduation from Salisbury State University, he served as a rifle platoon leader, support platoon leader, and battalion assistant S-3 in the 1-187 Infantry (Rakassans) and 5-87 Infantry in Panama. Attending the Infantry Officers Advanced Course at Fort Benning Georgia in September of 1988, Col Grigsby thereafter served as the battalion adjutant in 3-7 Infantry Battalion (Cottonbalers). He then went on to command B Company, 3-7 Infantry during Operations Desert Shield and Desert Storm. He returned from the Middle East to command Headquarters Company, 2-7 Infantry, thereafter serving two years as an infantry branch assignment officer.

In June of 1996 he assumed responsibilities as the chief of plans for the 82nd Airborne Division in Fort Bragg, North Carolina. Colonel Grigsby moved to 1-504th Parachute Infantry Regiment in October 1997 where he served as the battalion operations officer, later serving as the 504th Parachute Infantry regimental operations officer. In May of 1998 he served as the aide de camp to the commander of XVIII Airborne Corps, thereafter moving to the position of Director of Plans, XVIII Airborne Corps.

Col Grigsby assumed command of the 1-26 Infantry Regiment (Blue Spaders) in June 2001. He deployed the battalion in support of Kosovo Force 4A and as part of U.S. Army Forces Turkey in support of OIF I (Operation Iraqi Freedom, Phase I) and then served as the 1st Infantry Division G3 for two years, a period that included combat operations in support of OIF II.

Following his completion of the National War College course of instruction, Col Grigsby served as the Commander, 3rd Heavy Brigade Combat Team (HBCT)/3rd Infantry Division. His was one of the five surge brigades in Iraq during OIF V. He served as the Joint Operations Division Chief in the J33 joint staff following brigade command.

Col Grigsby later served as the chief of the ISAF Future Operations Cross-Functional Team in support of Operation Enduring Freedom, Afghanistan. He moved from that position to assume responsibilities as director of the School of Advanced Military Studies at Fort Leavenworth, Kansas.

Col Grigsby's military education includes the Infantry Officer Basic Course, Infantry Officer Advanced Course, Jumpmaster Course, the Command and General Staff College, Advanced Military Studies Program, and the National War College. He has earned a Masters degree in Military Arts and Science and a Masters in National Security Strategy.

Awards and decorations include the Defense Superior Service Medal, Legion of Merit (with oak leaf cluster), Bronze Star (two oak leaf clusters), and the Douglas McArthur

Leadership Award. Col Grigsby also wears the Combat Infantryman's Badge (second award), Expert Infantryman's Badge, Senior Parachutist Badge, and Ranger tab.

Col. Wayne W. Grigsby, Jr. is married to the former Miss Cynthia De Icaza, a published author from Panama City, Panama. Wayne and Cynthia have five children and one grandson.

Brigadier General (IDF) Herzi Halevi

Born in Jerusalem in 1967, BG Halevi joined the IDF's Nachal Brigade in 1985, which was then a component of the Paratroopers Brigade. He served in various command positions in the brigade and in 1992 commanded the TOW missile company. He thereafter commanded the training company at the GHQ Special Unit and in 2001 was appointed to command that unit, a position he retained until 2004. He moved on to command of the Jenin Brigade and later assumed command of the Paratroopers Brigade from 2007 to 2009. He currently serves as head of the Operations Department at the Intelligence Corps.

BG Halevi holds a Bachelor of Arts in Philosophy and Business Management and Master of Arts in National Resources Management.

Brigadier General (Australian Army) Mark Holmes, MVO



Brigadier Mark Holmes grew up in Brisbane and completed his secondary schooling at St Joseph's College, Gregory Terrace. He was commissioned from the Royal Military College - Duntroon in 1986 and assigned to the Royal Australian Armored Corps where he served in command and regimental appointments in the 1st Armored Regiment and 2nd/14th Light Horse (QMI). In 1992 Brigadier Holmes returned to the Royal Military College as a tactics instructor. Brigadier Holmes was posted to Darwin as Adjutant of the 2nd Calvary Regiment in 1994. He was promoted to major in 1996 and served in the Darwin Logistics Battalion as development officer, range control officer, and Robertson Barracks garrison manager. In 1997 he assumed responsibilities as squadron commander at the School of Armor, an assignment followed by attendance at Australian Command and Staff College at Fort Queenscliff in 1999.

In 2000-2001, Brigadier Holmes served as an Australian exchange instructor with the U.S. Armor School at Fort Knox, Kentucky. He was promoted on return to Australia where he served in the Directorate of Strategic Personnel Planning and Research and then in Future Land Warfare, Army Headquarters. In February 2003, Brigadier Holmes deployed on Operation (OP) BASTILLE and OP FALCONER (known later as OP

CATALYST) in a range of responsibilities with the Australian National Headquarters and Headquarters, Joint Task Force 633, responsibilities that included those as J5 and J3.

Brigadier Holmes commanded the Royal Military College - Duntroon from 2004 to 2005. In 2006 he was appointed as the Australian Equerry to The Queen for her visit to Australia after which he was granted Membership of the Royal Victorian Order (MVO) by Her Majesty. Brigadier Holmes was appointed Commandant, Combined Army Training Centre in June 2006.

In July 2008 Brigadier Holmes deployed on OP ASTUTE and took command of the International Stabilization Force (JTF 631) in East Timor. This was followed by attendance at the Centre for Defense and Strategic Studies, Australian Defense College in 2009. In January 2010 he assumed command of the Land Warfare Development Centre in Puckapunyal.

Brigadier Holmes has been awarded the Defense Force Service Medal, Australian Active Service Medal (ICAT and Iraq Clasp), Australian Service Medal (East Timor), Commander Australian Theatre Commendation for service on OP FALCONER, and the Meritorious Service Medal (USA).

Brigadier Holmes is married to Jenny who is originally from Canberra. They have three daughters: Rebecca, who is currently studying marine engineering at the Australian Defense Force Academy, Georgina (16), and Sarah-Louise (13).

Brigadier Holmes enjoys spending time with his family, travelling, watching live sport (in particular rugby union), and going to the movies.

Dr. David E. Johnson



Dr. David E. Johnson is a senior researcher at the RAND Corporation who also had a 24-year U.S. Army career, retiring as a colonel of field artillery. Dr. Johnson is a 1972 graduate of Trinity University. He also has Masters degrees from the U.S. Army Command and General Staff College, the Industrial College of the Armed Forces, and a MA and Ph.D. (History) from Duke University. He is the author of numerous books, articles, and reports including *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945*; *Military Capabilities for Hybrid War: Insights from the Israel Defense Forces in Lebanon and Gaza*; and *Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era*. His work has been on the U.S. Army Chief of Staff, the U.S. Air Force Chief of Staff, and the U.S. Army Training and Doctrine Command professional reading lists.

Professor Asa Kasher



Asa Kasher is an Israeli philosopher and linguist born on in Jerusalem in 1940. He is currently working at Tel Aviv University and is noted as the author of the Israel Defense Forces Code of Conduct. He wrote an influential defense of Israel's "law of return," justifying it as a form of affirmative action following periods during which Jews were not allowed to immigrate to many countries. He has also written about the possible meanings of a Jewish and democratic state, the meaning of a Jewish Collective, and many other topics. His essays on Jewish subjects appear in a book titled *Ruach Ish (Spirit of a Man)* published in Hebrew by Am Oved publishers. Professor Kasher is also the editor of the philosophy journal *Philosophia* and contributor to the fields of psychology and ethics.

Lieutenant General (U.S. Army, retired) Thomas F. Metz



Lieutenant General Thomas F. Metz enlisted in the U.S. Army in 1966, launching a military career that has taken him from his birthplace of Elkin, North Carolina to eventual duties as the director of the Joint Improvised Explosive Device Defeat Organization in Arlington, Virginia. He possesses the real-world experience of a combat commander who led over 100,000 coalition troops belonging to Multi-National Corps-Iraq during Operation Iraqi Freedom from 2004-2005.

General Metz was commissioned as an infantry officer following his 1971 graduation from the United States Military Academy at West Point, New York. He served in a series of positions of increased responsibility throughout a career as a leader and trainer of soldiers that included assignments in Europe, Korea, Iraq, and United States. From his start as a platoon leader in the 1st Battalion, 509th Parachute Infantry Regiment, Mainz, Germany, General Metz has commanded at every level from a rifle company up to III Corps and Fort Hood, Texas. He also served as the U.S. Army's Training and Doctrine Command's (TRADOC) Deputy Commanding General and Chief of Staff.

General Metz has been a key player in laying the groundwork for the U.S. Army's ongoing transformation, serving as the director of the 4th Infantry Division's experimental force from 1995-1997 and later then as the assistant division commander for the same command the following year. From 1998-2001, General Metz served in two key billets for prioritizing and allocating resources for the U.S.

armed forces: Deputy and Vice Director in the Joint Staff Force Structure, Resources, and Assessment Directorate, J-8 and later as Director, Joint Improvised Explosive Device Defeat Organization.

General Metz earned a Masters degree in mechanical engineering from North Carolina State University and taught the subject at West Point. He also holds a professional engineer license in the Commonwealth of Virginia. He is a graduate of the U.S. Army Command and General Staff and War Colleges, is an expert infantryman, and wears the Ranger tab and senior parachutist wings. His awards include the Defense Distinguished Service Medal, Distinguished Service Medal (with two Oak Leaf Clusters), Legion of Merit (three Oak Leaf Clusters), Bronze Star Medal, Meritorious Service Medal (two Oak Leaf Clusters), and Army Commendation Medal (three Oak Leaf Clusters).

Colonel (IDF, retired) Bennie Michelson



Joined the IDF in 1969.

Served as tank company commander during the Yom Kippur War in the Golan Heights

Tank brigade S2 and armored division G2

Commanded the Advanced Intelligence Officers Course

Commanded the Advanced Training Branch at the School of Intelligence

Was the Head of the IDF Military History Department

After completing his service with the IDF:

1993 -1996 – headed IMI business Intelligence office

1997-1999 – Strategic consultant for the MOD export division

Chairman of the Israeli Association of Military History

Historian of the Israeli Armored Corps Association

Resident Historian of the Jewish Warrior in WWII Museum

Academic education:

BA with honors in history from Tel Aviv University

MA with honors in Military and Diplomatic History from Tel Aviv University

Major General (IDF, retired) Izhak Mordechai



MG (IDF, ret) Mordechai joined the IDF Engineers Corps and later served as the engineering company commander in the Paratroopers Brigade during the Six Days War (1967), taking part in the battle of Rafah. During the 1973 Yom Kippur War he was the 890th Paratroopers battalion commander and took part in the Chinese Farm battle from which he was awarded a gallantry medal. General Mordechai commanded the 91st Division, the unit that captured the city of Tyre and the Rashidiya refugee camp during the 1982 Peace of Galilee War in Lebanon.

In 1983 he commanded a rescue operation known as the "300 Bus Operation" while Chief Infantry and Paratroopers Officer. He was promoted to MG in 1986 and served as commander in all three territorial commands (North, Center, and South). The 1st Intifada began during his time as commander of Southern Command and during his time in the Northern Command he commanded the 1993 operation.

MG Mordechai holds a BA in history from Tel Aviv University and MA from Haifa University. He is a graduate of both the IDF Command and Staff College and the UK Command and Staff College.

He joined the Likud Party in 1995 and following the 1996 elections was appointed as Minister for Defense in the Netanyahu government. In early 1999 he left the Likud and joined the then Merkaz party, serving as Deputy Prime Minister and Minister of Transportation.

Lieutenant Colonel (U.S. Army) John Scott Nelson



LTC Nelson has served with infantry units in the Republic of Korea; Vicenza, Italy; Germany; and as both an infantry task force executive officer and brigade combat team S3 in Baghdad.

His most recent combat tour was as commander of the 1st Squadron, 4th U.S. Cavalry in Ninewah Province, Iraq.

LTC Nelson's educational background includes undergraduate degrees from Georgia Military College and the University of South Carolina. He also has Masters degrees from Troy State University and the United States Army School of Advanced Military Studies.

He has been married for 19 years to the former Tina Martin. They have three children: AJ (14), Hannah (13), and Brianna (7). The family owns a horse ranch in Kansas where LTC Nelson and his family currently live and plan to remain after military service.

Mr. Ophir Shoham



Mr. Shoham graduated from the highly regarded Talpiyot Program for exceptional students.

He was the IDF's deputy head of the C4 division before assuming his post as Head of the MOD Development Authority.

Professor Arnon Soffer

Professor of Geography, University of Haifa, Israel

Born in Tel Aviv, 1935, married to Miriam, 4 children: Cilla, Ayelet, Hagit, Menachem

Education:

B.A., M.A., Ph.D., Geography, Hebrew University of Jerusalem, Israel

Professional Experience:

- | | |
|------------|---|
| 2005-2010 | Professor Emeritus |
| 1998-2010 | Head of the Chaikin Chair of Geostrategy, University of Haifa;
Head of the Research Center of the National Defense College,
IDF. |
| 1964-2010 | Teaching: Department of Geography and Political Sciences,
University of Haifa and National Defense College.
Visiting Professor: Hebrew University of Jerusalem, University of
Utah, Portland State University, United States Military Academy,
University of London, National Defense College, Army Command
and General Staff College, Police Command Staff College. |
| 1980-2010 | Advisor to the Israeli Ministries of Defense, Police, Foreign
Ministry, Prime Minister, Interior, Education, Housing, Industry. |
| 1992-1995: | Member of the military delegation to the Oslo peace talks |
| 1986-1989 | Dean of the faculty of social sciences and mathematics, University
of Haifa. |
| 1982-1986 | Chairman of the Jewish-Arab Center and the Institute of Middle
Eastern Studies, University of Haifa |
| 1970-1973 | Chairman, Department of Geography, University of Haifa |

Publications:

27 books and monographs, 14 educational books, and about 210 articles on Jewish-Arab relations; military geography; demography; education; water in the Middle East, Israel, and Galilee, and mountain geography

Articles and interviews in various newspapers and journals including the *New*

York Times, Los Angeles Times, Chicago Tribune, Christian Science Monitor, The Independent, New Scientist, Newsweek, Wall Street Journal, and U.S. News and World Report. Television and radio appearances in Israel and abroad during the period 1972-2007 include those with the British Broadcasting Company and media organizations in the Netherlands, Japan, Azerbaijan, Latin America, Canada, U.S.A. (CNN, NBC, and local), Denmark, Germany, Russia, Georgia, Spain, Portugal, West Bank and organizations representing the Arab World.

Professor Arnon Soffer



Professor of Geography, University of Haifa, Israel
Born in Tel Aviv, 1935, married to Miriam, 4 children: Cilla, Ayelet, Hagit, Menachem
Education:
B.A., M.A., Ph.D., Geography, Hebrew University of Jerusalem, Israel

Professional Experience:

- | | |
|-----------|---|
| 2005-2010 | Professor Emeritus |
| 1998-2010 | Head of the Chaikin Chair of Geostrategy, University of Haifa; Head of the Research Center of the National Defense College, IDF. |
| 1964-2010 | Teaching: Department of Geography and Political Sciences, University of Haifa and National Defense College.
Visiting Professor: Hebrew University of Jerusalem, University of Utah, Portland State University, United States Military Academy, University of London, National Defense College, Army Command and General Staff College, Police Command Staff College. |
| 1980-2010 | Advisor to the Israeli Ministries of Defense, Police, Foreign Ministry, Prime Minister, Interior, Education, Housing, Industry. |
| 1992-1995 | Member of the military delegation to the Oslo peace talks |
| 1986-1989 | Dean of the faculty of social sciences and mathematics, University of Haifa. |
| 1982-1986 | Chairman of the Jewish-Arab Center and the Institute of Middle Eastern Studies, University of Haifa |
| 1970-1973 | Chairman, Department of Geography, University of Haifa |

Publications:

27 books and monographs, 14 educational books, and about 210 articles on Jewish-Arab relations; military geography; demography; education; water in the Middle

East, Israel, and Galilee, and mountain geography

Articles and interviews in various newspapers and journals including the New York Times, Los Angeles Times, Chicago Tribune, Christian Science Monitor, The Independent, New Scientist, Newsweek, Wall Street Journal, and U.S. News and World Report. Television and radio appearances in Israel and abroad during the period 1972-2007 include those with the British Broadcasting Company and media organizations in the Netherlands, Japan, Azerbaijan, Latin America, Canada, U.S.A. (CNN, NBC, and local), Denmark, Germany, Russia, Georgia, Spain, Portugal,

West Bank and organizations representing the Arab World.

Mr. Timothy Thomas



Timothy L. Thomas is an analyst at the Foreign Military Studies Office (FMSO), Fort Leavenworth, Kansas. He retired from the U.S. Army as a lieutenant colonel in the summer of 1993. Mr. Thomas received a Bachelor of Science degree from West Point and an MA from the University of Southern California. He was a U.S. Army foreign area officer who specialized in Soviet/Russian studies. His military assignments included serving as the Director of Soviet Studies at the United States Army Russian Institute (USARI) in Garmisch, Germany; inspector of Soviet tactical operations under CSCE; and brigade S-2 and company commander in the 82nd Airborne Division. Mr. Thomas has researched and published extensively in the areas of peacekeeping, information war, psychological operations, low intensity conflict, and political-military affairs. He is a former assistant editor of the journal *European Security*; adjunct professor at the U.S. Army's Eurasian Institute; and adjunct lecturer at the USAF Special Operations School. He is a member of two Russian organizations, the Academy of International Information and Academy of Natural Sciences.

Major General (IDF) Shlomo (Sami) Turgeman



MG Turgeman enlisted in the IDF in 1982 and has spent most of his service in the armored corps.

Served as tank commander, tank platoon leader, and tank company commander.

In 1992 appointed as commanding officer, 52 Tank Battalion

In 1996 appointed as reserve tank brigade commander and instructor in the company and battalion commanders course.

Head of the Training Department at the Ground Forces

Command Headquarters from 1997 to 1999.

From 1999 – 2001, commanded 500 Tank Brigade and later the Armored Corps Training Brigade.

Promoted to BG in 2003, commanded a reserve division in the Northern Territorial Command, then served as Chief of Armor (2004-2005).

Between 2005 and 2007, served at IDF GHQ as the Head of Operations Division

From 2007 to 2009 commanded the Central Territorial Command Regular Division

In September 2009 promoted to MG and appointed as Commander, Ground Forces Command

Major General (IDF, retired) Amos Yaron



Commissioned as an infantry officer in 1959

Fought with Paratroopers Brigade as S3 in Jerusalem in 1967

Deputy Commander of Paratroopers Brigade in Yom Kippur War (1973)

Commanded Paratroopers Brigade in 1976

In 1978 appointed as division commander

In 1980 headed the Operations Department, IDF GHQ

Appointed as Chief Infantry and Paratroopers Officer in 1981

In 1982 commanded the division that landed from the sea on the Lebanese shore during the Peace for Galilee War, fought along the road to Beirut and in Beirut.

Promoted to MG in 1983 and served as the GHQ J1

Served as the Israeli Defense Attaché in the USA in 1986

From 1999 – 2005 served as MOD Director General

Currently Chairmen of the Eilat - Ashqelon Pipeline Company

Yaron holds a BA in Middle East Studies and History from Tel Aviv University

He graduated from the IDF Command and Staff College, USMC Command and Staff College, and IDF National Defense College.

Appendix 3: Presentation Abstracts

Defeating the IED as a Weapon of Strategic Influence **(Lieutenant General Thomas F. Metz)**

During 2004 in Operation Iraqi Freedom, the number of Improvised Explosive Devices (IEDs) found and detonated grew from 300 to 1,000 per month. When Robert M. Gates was appointed the Secretary of Defense, he described a crumbling commitment on the part of Congress and the public to stay the course in Iraq as a result of protracted IED violence. He saw an “impending strategic calamity.”

The commander of U.S. Central Command, General John Abizaid, called for a “Manhattan [Project]-like” effort to defeat the IEDs used by extremists in Iraq. General Monty Meigs returned from retirement and established the Joint IED Defeat Organization in February 2006. In his first year back in service, IEDs in Iraq would grow to 3,000 per month. Bold and innovative actions were required; the U.S. Congress initially supported with \$4 billion of “three year, uncolored” supplemental funds.

Three lines of operation were established: Defeat the Device, Attack the Networks, and Train the Force. As these lines of operations came together, U.S. forces in Iraq began to win the counter-IED fight. This focus on defeating the IED as a weapon of strategic influence significantly helped to enable a seasoned, professional force to employ itself properly in a counterinsurgency campaign. The IED campaign in Afghanistan took a different path. The insurgents there nonetheless learned from Iraqi insurgents and were just as smart, innovative, agile, and ruthless.

The IED will not be defeated as a lethal ambush, but it can be defeated as a weapon of strategic influence. The former goal is both ideal and impossible; the latter is achievable and essential to victory.

Merkava Protection Program Development **(Colonel Baruch Mazliach)**

To date Israel has developed four generations of tanks, from the Merkava Mk 1 to the Merkava Mk 4. From the beginning, the concept motivating development of all Merkava models has been that the human element is at the center of combat vehicle design. We put the soldier at the center and then plan systems around him. This approach caused us to put the engine up front in the Merkava as it thereby better protects the crew and passengers in the vehicle. Yet it is important to remember that

all systems take part in protecting our soldiers; a frontal power pack also allows the tank to have a rear door, making it possible for up to six infantrymen to ride in the back of the vehicle.

We introduced modular protection in the Mk 3 model and continued its use in the Mk 4. Related new technologies allow us to relatively easily replace components of the protection system, thereby avoiding the need to perform a complete retrofit at depot level maintenance when we attain significant advances in force protection. The result – the sum total of Merkava protection – is what we call special armor. In total the result is a protection system that we believe more or less exhaustively covers the vehicle's survivability and crew protection potential. There may be room for some future improvements but we envision no major ones within the current state of technological capabilities. Current approaches combine one or more elements of *active protection* that attack incoming threat munitions, *deception* to confuse the foe, or *reactive protection*.

Regardless, the objective is to terminate a threat before it gets to the tank. The active protection system has radar that informs the tank computer when a missile is identified and allows the tank commander to acquire it on his screen. The tank commander can then bring the tank's main gun to bear on the impending threat and engage simply by pushing a single button.

The Modern City and Urban Warfare **(Professor Arnon Soffer)**

Today we have cities like Mexico City and Tokyo with populations of 23-30 million people. How can modern militaries conduct a successful siege against such metropolitan areas, urban conglomerations the size of Israel as are Beijing and Los Angeles? We live in a new world. Cities are at their largest in history. For the first time over 50 percent of the world population lives in cities.

How does one determine what constitutes a city? Tel Aviv's population is formally about 400,000. Dan County of which it is a part contains 1,300,000 people while Tel Aviv as a metropolis is some 3,500,000 people. The megalopolis that runs along the east coast of the United States from Washington, D.C. to Boston encompasses between 30 and 40 million people and is in excess of 800 kilometers in length. As a military man, what do you occupy if you are to control this area? Who are its power brokers? What are its economic centers? Key communication nodes? What will you do after you capture the city with what are likely millions of hungry and sick while your operations are overlooked by many layers of media and human right organizations?

The City as an Operational Challenge **(MG Sami Turgeman)**

Urban terrain is today's military challenge. We at Ground Forces Command see it as our main challenge, not so much at the tactical as at the operational level. In the past the IDF encountered urban warfare in cities with terrain, geographical size, and characteristics much different than today. The IDF uses different approaches given its varied current and potential missions: sieges, penetrations, or attacks on selected vital components of a city in addition to systematic assaults with the objective of seizing entire built-up areas. Today's enemies often base their defenses within cities, use the population for force protection, and thereby challenge our militaries that are traditionally prepared for other scenarios. The resulting challenges influence the tactical and operational levels: How do we develop a fighting concept and the supporting means, methods, and other elements key to preparing our forces?

Employing a Penetration Attack to Capture an Urban Area: ***Case Study Grozny*** **(Mr. Timothy Thomas)**

Russian forces conducted a direct assault on the city of Grozny, population 400,000, in 1994. A group of a few hundred Chechens were able to thwart the assault of several thousand Russian soldiers and hold the city for a week before retreating to the countryside. Russian forces were surrounded and decimated, calling into question the competency and even survival of a once proud armed force. Years later, in 2000, Russian forces again assaulted the city. This time Russian military leaders surrounded the city and pounded it with artillery before entering. The outcome was entirely different. Chechen forces were deceived into fleeing at night into a prepared mine field.

This briefing will discuss the lessons learned by the Russians and Chechens during these two encounters. Also discussed are several afterthoughts from Russian combatants as they looked back on their urban combat experiences in Chechnya.

***Siege and Frontal Attack in the Urban Offensive:
The Case of Tyre in Lebanon (1982)***
[MG (ret) Yizhak Mordechai]

While fighting over Tyre in 1982, 91 Division operated with two main efforts: (1) seizing the city and removing the PLO presence, and (2) minimizing the damage and casualties caused to the city and its people throughout the operation. The division moved from the Israeli border and reached Tyre while another division landed from the sea and moved northward to Beirut.

The PLO at Tyre was isolated from other PLO forces in Lebanon and the city was under siege. In order to minimize the non-combatant population involvement in the battle, the residents were urged to leave the city and go to the Mediterranean beach where they could stay safely until after the battle. PLO members and supporters who wished to fight were thus separated from the civil population and we gained more freedom of action during operations in the city itself.

***Employing Nonlinear Operations to Control a City:
The Case of Baghdad (2004)***
(Colonel Wayne W. Grigsby)

Fighting a comprehensive counterinsurgency operation must entail true synchronization of security, governance, development, and information operations in both time and space. I have developed a series of lessons learned from 50 months of combat experience in Kosovo, Iraq, and Afghanistan since September 11, 2001, lessons in retrospect wish I had drawn on more as commander of a brigade combat team during Operation Iraq Freedom 2 from February 2004 to February 2005. Critical among them: if you make the assumption when executing comprehensive COIN operations that an end state is stability at all levels, then simultaneous synchronization of security, governance, development, and information operations by an efficient command and control structure is vital.

I will consider six primary points in my efforts to suggest how a commander might synchronize these operations during future operations. First, we must understand and execute embedded partnership. Embedded partnership is a formally established, recognized, and sanctioned command and control relationship between or among elements at any echelon that:

Combine and share resources – material and intellectual – without constraints

Share responsibility for devising plans, executing missions, and achieving objectives.

In short, embedded partnership means soldiers from all units involved will eat, sleep, train, plan, brief, rehearse, fight, and recover together. Secondly, we must continue to close with and destroy those that threaten the stability we seek to establish. Thirdly, we need to truly partner, train, and equip the host nation's police force so they can properly secure the people at the village and district levels. Fourth, build a true partnership with the host nation government from the national to sub-national to district level. We then can develop leaders and hold them accountable so they properly govern and build the right developmental programs. Fifth, we must reintegrate people that no longer want to be part of the insurgency and want to support the credible government of the host nation. Finally, we must build an efficient command and control structure that supports bottom-up collaborative planning from the lowest level. There is no silver bullet for success, but it is my hope that some of these points may help us assist host nations in achieving future successes.

Developing an Urban Database in Support of Military Operations –1982 Beirut [COL (Ret.) Bennie Michelson]

Beirut is the only capital city about which we completed an IPB that was later used in battle.

The purpose of that file was to support the forces in two tasks: capture the city and control it.

Preparatory work was based on former intelligence data collected by the IDF GHQ. A joint General Headquarters-Territorial Command team was established, led by the Territorial Command.

The file content consisted of:

- Introduction
- The city defense as seen by the enemy
- The influence of the terrain on the fighting in the city
- The enemy method of defense
- Lessons learned from past urban battles
- Collecting intelligence in urban terrain
- Operational analysis of the city defenses
- Information on the city infrastructure

Synchronizing Intelligence and Maneuver in Support of Urban Combat - Bagdad (LTC John Scott Nelson)

The United States Army has learned valuable lessons in Iraq regarding how to synchronize useful intelligence and achieve effective maneuver in support of the commander's intent. The complex environs of a city demand tight targeting/decision cycles to achieve maneuver success, maneuver being defined as seeking positional advantage over opposition to accomplish the mission. Targeting methods must provide a means to define the problem accurately, resource efforts properly, and allow commanders at every echelon to be empowered to pull, push, and share relevant intelligence to achieve effective and timely maneuver. Further, a commander's comprehensive knowledge of the operational environment is critical to developing effective guidance for targeting. The nature of targeting in Iraq serves asymmetric and decentralized tactical problem sets, some of which directly affect operational and strategic issues. As a result, condition setting and resourcing capabilities at the lowest levels have given tactical commanders the ability to achieve rapid tactical success with minimal delays. While this is advantageous for tactical commanders, it is difficult for those at higher echelons to assess results and determine the effects achieved in the service of identifying the next series of targets. Thus the challenge is not for the lower unit to gain a tactical understanding of its environment through a higher unit's collection assets; rather, it is for the higher unit to gain useful intelligence from lower units.

"Know Your Enemy: The Irregular Threat and Urban Combat:" Operation Cast Lead, Gaza 2009 **[Dr. Colonel (retired) Reuven Erlich]**

The physical characteristics of Gaza are simple. It is 365 square kilometers containing 1.5 million people, most of whom live in refugee camps. Hamas doctrine takes these conditions into account and their operations are based on several straightforward principles:

- Avoid direct confrontation with IDF forces in open terrain
- Channel the IDF into built-up areas
- Use the civil population to support objectives whether or not the population voluntarily provides such support

The Hamas military structure includes about 15,000 people organized in semi-brigades. They are often deployed in refugee camps and public establishments such as hospitals and mosques. They in addition take advantage of an extensive underground system. At the time of Operation Cast Lead they had about 2500

rockets, thousands of mortars, hundreds anti-tank launchers, and dozens air defense missiles. They additionally employed thousands of improvised explosive devices. Their preparations included training in Gaza and advanced training conducted in Syria, Iran, and Lebanon.

Role Changing from Combat to Population Control – The Case of East Timor (BG Mark Holmes)

In 1999 the East Timorese people voted for independence from Indonesian control. As a result of the ensuing violence, Australia was required to assume lead nation status of a hastily formed coalition that provided military forces to restore stability. The stabilization force, which came to be known as INTERFET, exercised a mandate under Chapter VII of the United Nations charter. The ensuing operation (Operation STABILISE) constituted the most substantial deployment of Australian military forces since the end of the Vietnam War.

The Australian-led mission in East Timor was widely considered to have been a success. Apart from isolated incidents, there was no combat between the peacekeeping forces and militia or the Indonesian Army (TNI). However, the operation exposed numerous deficiencies in Australia's ability to deploy and to sustain combat forces in our immediate area of security concern.

Strategically, Operation STABILISE was always going to be complex and challenging. Indonesia was then, and remains today, of fundamental importance to Australia's regional strategic interests; managing the sensitive relationship with the Indonesian forces in East Timor was essential to the peaceful achievement of INTERFET's mission. But conditions that Australian soldiers were confronted with on arrival meant that the situation quickly and necessarily evolved from stabilization to a nation-building operation. Throughout the first ten years of this century, the Australian Defense Force has continued to support the East Timorese government and people. This support has sometimes required redeploying combat forces (as in the case of a 2006 security crisis) and at other times providing security advice and development (via the Defense Cooperation Program).

The army also continues to learn and incorporate important skills acquired during operations in East Timor, coalition building and maintenance, joint operations processes, interoperability between it and other security sectors, communication across all sectors (including information operations and perception management), and effective civil-military relationships among them. As its role in Australia's regional security evolves, so must the Australian Army's response to its partners and enemies.

Close Fire Support during Urban Combat: Gaza, 2009 **(BG Herzi Halevi)**

During Operation Cast Lead, the Paratroopers Brigade fought in the streets of Gaza and provided fire support from many sources and of various types. It was an outstanding joint operation that also incorporated Israeli Air Force support

The Paratroopers Brigade had gone through extensive preparation in the two years preceding the operation, training that incorporated lessons learned from the Second Lebanon War (2006). Its close air support section was strengthened, for example; it operated closely with assault helicopters to develop procedures for accurate and effective fire support during ground operations.

Fires as the Decisive Element during Urban Combat: 1982 Beirut [MG (ret) Amos Yaron]

We reached Beirut during Operation Peace for Galilee with one aim in mind: remove PLO fighters from Lebanon. We had no intention of occupying Beirut and we tried to avoid fighting in it. We put the city under siege and employed extensive air and ground fires to persuade the PLO to leave. Yet only when we started moving our infantry into the Lebanese capital did the PLO surrender, eventually withdrawing from the city and later the whole of Lebanon.

Fire in Support of Maneuver: The Case of November 2004 Fallujah **(Lieutenant General Thomas F. Metz)**

On 31 March 2004, four Blackwater contractors were murdered in Fallujah, Iraq and their bodies desecrated for the entire world to see. Coalition Joint Task Force-7 reacted immediately by sending the 1st Marine Division into Fallujah. The Sunni insurgents in Fallujah fought a defensive lethal battle and a very offensive non-lethal battle. With political support for the capture of Fallujah crumbling as a result of the insurgents' effective information operations campaign, the marines halted their attack and turned the security of Fallujah over to a local militia called the Fallujah Brigade.

The Fallujah Brigade was a failure. The insurgents soon enjoyed a safe haven in the city. This cancer had to be removed before the Iraqi elections of January 2005. Because the initial battle of Fallujah triggered not only a Sunni uprising across

northern Iraq but also a Shia uprising across southern Iraq, the second battle for Fallujah was a Multinational Corps-Iraq operation involving the entire coalition countrywide.

Direct and indirect fires were employed in the preparation and execution of the second battle of Fallujah, masterfully mixing accuracy and volume from tanks, howitzers, mortars, and rotary and fixed wing aircraft, both manned and unmanned. These lethal fires were required to destroy the enemy in Fallujah. But they alone were not sufficient for victory. Nonlethal fires in the form of a well-planned and executed information operations campaign were also required to ensure the success of the second battle of Fallujah.

The lessons learned by U.S. forces in the second battle of Fallujah clearly highlight the need for synchronizing lethal and nonlethal fires to support maneuver for battle in the 21st Century.

Technological Developments in Support of Urban Combat **(Mr. Ophir Shoham)**

Fighting in urban terrain seriously challenges weapon system developers as it calls for a major change in the technologies militaries habitually use in open terrain.

Short ranges and facilities that hide and protect enemy combatants and their weapons, and conceal members of the civil population, make an already dense and challenging environment all the more difficult. Reaction times shorten to a few seconds and lines of sight and fields of fire drop to few dozen meters.

Logistics in Support of Combat and Humanitarian Assistance Operations during Urban Operations **(BG Moffid Ganem)**

Fighting in urban environments challenges the Israeli Army's logistic efforts. The concept used in supporting armored operations in open terrain and moving deep into enemy territory is unsuitable for this type of warfare. With many forces operating in close terrain, limits on maneuverability combine with the presence of the civil population to force us to search for new support concepts.

***The Evolving Roles of Ground Power and Air Power Across
the Range of Military Operations (Dr. David E. Johnson)***

This briefing examines the evolving roles of ground power and air power in the post-cold war era through Operation Iraqi Freedom in 2003. It then discusses how adversaries have adapted to U.S. and Israeli conventional dominance and what the implications are for future warfare in complex terrain. The lessons are relevant to understanding the capabilities a joint force will require in the future.

The Code of Ethics during Fighting in Urban Terrain

(Professor Asa Kasher)

We need to act in the war against terror in ways that will ensure the safety and well being of Israeli citizens so that we can look at ourselves in the mirror and say, "We conducted operations properly. This is the country we want to live in." We need to pass the effective defense test and have a suitable democratic moral image in our own eyes. There are three different fronts in which these issues emerge: When to start a war or military action, What do to while it is ongoing, and what to do after it is over to secure order and promote a lasting peace.

As a state we will behave exactly as we did during Operation Cast Lead; it was right and moral. When soldiers are in uniform they must convey values articulated by the IDF and the state of Israel because they act on behalf of the IDF and the state. We must not forget that there are differences between state citizens and other human beings. Only state citizens take part in elections and the state is obliged to provide them with healthcare and education in accordance with human and constitutional rights. The state must protect them on the basis of the law of human dignity and freedom; it has a special relationship with its citizens that it does not have with other people.

The Code of Ethics during Fighting in Urban Terrain **(Professor Asa Kasher)**

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The Role of the International Media (Ms. Sheera Frenkel)

Closer understanding between the IDF and media – and the cooperation that would accompany it – is highly desirable. IDF claims to be “the most ethical armed forces in the world” tend to fall on deaf ears without objective reports from the media during undertakings such as Operation Cast Lead.

Appendix 4: International Attendees

TITLE	MILITARY SERVICE	FIRST NAME	LAST NAME	POSITION	ORGANIZATION/COUNTRY
Brigadier General	Active	Kevin	Abraham	Director Concepts	UK MOD (Army)/UK
Major	Active	Iain	Addinell		MOD/Australia
Captain	Active	Francisco	Ahrens	Military and Naval Attaché	Chilean Embassy/Chile
Lieutenant Colonel	Active	Ramon	Armada	ISAF Analyst, Plans Branch (J-5)	Chief of Defence Staff, Joint Operational Command/Spain
Mr.		Tanirbergenov	Ayapbergen		Kazakhstan
Captain	Active	Paul	Becker		Germany
Mr.		Andrew	Bell	Delegate to the Armed Forces	International Committee of the Red Cross/UK
Doctor		Wolfgang	Boettger	CEO	Dynamit Nobel Defence/Germany
Lieutenant Colonel	Active	Henk	Bos	Commander, Instruction Platoon, Urban Ops	Dutch MOD, Netherlands
Colonel	Active	Richard E.	Burns	Director	OSD Comparative Technology Office/U.S.
Colonel	Active	Curt	Carson	Operations Officer	Joint Maneuver Training Center/U.S.
Colonel	Active	Liviu	Craciun	Defense Attaché	Embassy of Romania/Romania
Colonel	Active	Todd	Cyril	Army Attaché	U.S. Embassy, Tel Aviv/U.S.

TITLE	MILITARY SERVICE	FIRST NAME	LAST NAME	POSITION	ORGANIZATION/COUNTRY
Lieutenant Colonel	Active	Jarst	de Jong	Commanding Officer, 1st Marine Battalion	Royal Netherlands Marine Corps/Netherlands
Lieutenant Colonel	Active	Heimo	De Luna	Military Attaché	Brazil
Colonel	Active	Ireneusz	Drazyk		Poland
Mr.		John	Duncan	Tactical Advisor	Wexford Group International/U.S.
Colonel	Active	Nikolaus	Egger	Defence Attaché	Austria
Lieutenant Colonel	Active	Mark	Elfendahl	Chief of the Joint & Army Concepts Division	U.S. Army/U.S.
Mr.		Vladimir	Eremin	General Manager	NeftGazAeroKosmos/Russia
Mr.		Mark	Flavell	Sales Director	Polamco/UK
Ms.		Sheera	Frenkel	Journalist	U.S.
Lieutenant Colonel	Active	Jonas	Froberg		Sweden
Mr.		Sebastian	Fuentes		Marioff/Finland
Lieutenant Colonel	Reserve	Shapira	Gadi	Vice President	Guest Associates, Inc./U.S.
Major	Active	Jan Frederik	Geiner	Project officer	Norwegian Army/Norway
Doctor		Russell W.	Glenn	Senior Analyst	A-T Solutions/U.S.
Colonel	Active	Wayne W.	Grigsby, Jr.	Director, School of Advanced Military Studies	U.S. Army Command and General Staff College/U.S.
Lieutenant Colonel	Active	Matthias	Habermann		MoD Army Staff/Germany
Lieutenant Colonel	Active	Juan	Hernandez-Gutierrez		Spanish Army/Spain
Brigadier General	Active	Mark	Holmes		Australia

PROCEEDINGS OF THE 2010 ZVI MEITAR INSTITUTE FOR
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TITLE	MILITARY SERVICE	FIRST NAME	LAST NAME	POSITION	ORGANIZATION/COUNTRY
Colonel	Active	Legrand	Hubert		Centre d'entraînement aux actions en zone urbaine (CENZUB)/ France
Major	Active	Bryan	Hunt		U.S.
Lieutenant Colonel	Active	Gerrit	Hut		Netherlands
Brigadier General	Active	Martin	Jawurek	Director, Operational Planning, MOD	Austrian Armed Forces/Austria
Doctor		David	Johnson	Senior Researcher	RAND Corporation/ U.S.
Mr.		Assen	Kashkenov		Kazakhstan
Lieutenant Colonel	Active	Joseph	Kemmer	Joint & Army Concepts Division	U.S. Army/U.S.
Mr.		Andrey	Kilin		NeftGazAeroKosmos/ Russia
Colonel	Active	Grzegorz	Kobusinski	Chief of Lessons Learned Branch	Land Forces Command/Poland
Mr.		Wolfgang	Kolb	Sales Director	Krauss-Maffei Wegmann GmbH & Co. KG/Germany
Captain	Active	Valery	Kotogarov		Ukraine
Lieutenant Colonel	Reserve	Karel	Kudlička	Lessons Learned Officer	Armed Forces of the Czech Republic/Czech Republic
Major	Active	Christopher	Kuzio		U.S. Army/U.S.
Captain	Active	Nicholas	Lane	Aide de Camp	U.S.

TITLE	MILITARY SERVICE	FIRST NAME	LAST NAME	POSITION	ORGANIZATION/COUNTRY
Lieutenant Colonel	Active	Matthias	Lau	Commanding Officer, Airborne Infantry Battalion	German Army/Germany
Major General	Reserve	Bernard	Le Roy		Thales/France
Brigadier General	Active	Leontaris	Llias		Greece
Mr.		Niklaus	Locher	Head of Sales & Marketing	Redfox AG/Swaziland
Mr.		Stefan	Manolache	Director Business Development	Carl Zeiss Optonics GmbH/Germany
Colonel	Active	Nikolaos	Manolakos	Deputy Director	Logistic Support Division/Greece
Mr.		Alejandro	Márquez	Counselor	Spanish Embassy/Spain
Lieutenant Colonel	Active	Yuriy	Matvyenko		Ukraine
Colonel	Active	Michael	McLean	Canadian Defence Attaché	Canadian Embassy/Canada
Lieutenant General	Retired	Thomas F.	Metz		U.S.
Captain	Active	Christian	Mogensen		Denmark
Mr.		Mark	Morgan	Project Analyst	OSD Comparative Technology Office/U.S.
Mr.		Yedil	Myrzakhanov		Kazakhstan
Colonel	Active	John (Scott)	Nelson	Squadron Commander	U.S. Army/U.S.
Colonel	Reserve	Kenneth	Newlin	76th Brigade Commander/CPI Director	Indiana National Guard/U.S.
Mr.		Timo	Nirennen		Marioff/Finland
Colonel	Active	Dalle	Noger	Military Attaché	Italian Air Force/Italy
Colonel	Active	Jan	Nowak	SSO	MON/Poland
Mr.		Galym	Orazbakov	H.E. Ambassador	Kazakhstan

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TITLE	MILITARY SERVICE	FIRST NAME	LAST NAME	POSITION	ORGANIZATION/COUNTRY
		Jody	Penrod	Advisor	Asymmetric Warfare Group/U.S.
Colonel	Active	Axa	Perwich		U.S.
Mr.		Andrew	Polson	Managing Director	Polamco/UK
Major	Active	Meriadec	Raffray	French Land Forces	Defense and Forces Employment Center/France
Lieutenant Colonel	Active	Bill	Sabbage		U.S. Army TRADOC/U.S.
Brigadier General	Active	Steven	Salazar	Commanding General of the Joint Multinational Training Command	U.S.
Colonel	Active	Aldemar	Sanchez		Colombia
Mr.		William	Santoro	Advisor	Asymmetric Warfare Group/U.S.
Captain	Active	Panagiotis	Sinanoglou	Defense Attaché	Greek Embassy/Greece
Colonel	Active	Philip	Stack		Attaché/UK
Professor		Maurus	Tacke	Director	Fraunhofer IOSB/Germany
Colonel	Active	Nunzio	Tarantelli	Defense Attaché	Italian Embassy/Italy
Mr.		Stephen (Tom)	Tate	Defense Cooperation in Armaments Officer	U.S. Embassy/U.S.
Doctor		Joseph	Thomas	Lakefield Distinguished Military Professor of Leadership	U.S. Naval Academy/U.S.

TITLE	MILITARY SERVICE	FIRST NAME	LAST NAME	POSITION	ORGANIZATION/ COUNTRY
Mr.		Timothy L.	Thomas	Analyst	U.S. Army Foreign Military Studies Office/U.S.
Major	Active	Emanuel	Thomeer	Operations Staff Officer	Royal Netherlands Marine Corps/ Netherlands
Lieutenant Colonel	Active	Robert	Tibensky		Slovakia
Colonel	Active	Todd	Townsend		U.S. Army/U.S.
Mr.		Andrej	Vilar	Adviser for Armor and Anti-Armor Missile Technology	Ministry of Defence/ Slovenia
Mr.		Oleg	Vilshansky	Total Trade International Projects & Trade, Ltd.	Russia
Mr.		Mark	Vinson	Research Staff Member	Institute for Defense Analyses, U. S. JFCOM/U.S.
Colonel	Active	Jeffrey F.	Vuono	Deputy Director, Future Warfare Division	U.S. Army TRADOC/U.S.
Doctor		Heinrich	Waellermann	Product Manager	Diehl BGT Defence GmbH/Germany
Mr.		Christopher	Wharton	Operations Advisor	Asymmetric Warfare Group/U.S.
Colonel	Active	Albert	Widmer	Defence and Air Attaché of Chile	Embassy of Chile/ Chile
Brigadier General	Active	Sławomir	Wojciechowski	Brigade Commander	17 Mechanized Brigade/Poland
Mr.		Erik	Yakubayev	Minister-Counselor	Kazakhstan
Lieutenant Colonel	Active	Aganazzi	Yannick	Land Forces Command Headquarters	French Ministry of Defense/France

Appendix 5: Industry Sponsors

Industries Display at the Latrun 4th Annual International Conference



Israel Aerospace Industries (IAI) is one of Israel's leading technological-industrial companies and Israel's largest industrial exporter. The Company has gained worldwide recognition as the leader in the development of aviation and aerospace technology in the military and civilian markets alike.

IAI provides Israel Defense Forces (IDF) and its foreign customers with unique, high-quality technological solutions that meet a wide range of needs on the ground, in the sea, in the air, in space and in the field of homeland security, including: conversion, repair and maintenance of commercial aircraft; development and production of: advanced radars, secure communications, AEW, EW, ELINT/ESM, SIGINT and COMINT/COMJAM, air-to-air refueling, upgrading of military aircraft and helicopters, Anti-Tactical Ballistic Missiles (ATBM), optronic payloads, navigation, precision-guided munitions, missiles, launchers, communications satellites, observation satellites and ground services, electronic systems, avionics systems, and unmanned aerial vehicles.

IAI has a staff of around 17,000 employees, of whom around 40% are university graduates, mainly engineers and scientists.



Netline Communications Technologies (NCT) Ltd. specializes in counter-terror electronic warfare. Netline develops, manufactures and sells high-end, fully programmable RF communication jamming and detection systems for the world's leading military units, police forces and government agencies.

Netline's ruggedized IED jammers are field-proven to save lives and assets from remote detonation of IEDs. Netline's vast and varied experience enables us to offer the most suitable solution for each mission type. Our products are used on a daily basis, protecting military and security agencies in conflict zones and around the world.

ELTICS **Eltics Ltd**

A technology start-up founded in 2006 in Ashkelon, Israel, developing the world's first active Adaptive stealth technology against thermal imaging night vision and heat seeking missiles. The technology is patent pending.

Eltics' mission is to bring stealth anti night vision technology to increase survivability, enemy deception, and false situation awareness, save lives and create significant combat advantage.

The technology generates Active Thermal Signature so that the target is either INVISIBLE = STEALTH or appears to be something else = FAKE THERMAL SIGNATURE.

IMI **Israel Military Industries Ltd. (IMI)**

Established in 1933. Israel Military Industries Ltd. (IMI) is a defense weapon system house, specializing in the development and manufacture of offensive and defensive solutions for the modern battlefield, Home Land Security and terror threats. IMI's state-of-the-art advanced systems, for ground, air and naval forces, are based on the extensive experience of the Israel Defense Forces (IDF), most of them are combat-proven and have been qualified by the IDF, USA Military (Army, Air Force & Navy) and NATO armies.

IMI designs, upgrades, produces and integrates full combat solutions, as well as providing professional training and services, meant to fully respond the specific customer needs of survivability & protection, fire power and mobility of its systems in battlefield rigid conditions.

IMI with its five divisions: Munition Systems, Land Systems, Rocket Systems, Advanced systems & Small Caliber Ammunition, employs about 3,400 highly qualified, professional and devoted employees.

Elbit Systems Ltd.

Elbit Systems Ltd. Is an international defense electronics company engaged in a wide range of defense-related programs throughout the world. The company, which includes Elbit systems and its subsidiaries, operates in the areas of aerospace, land and naval systems, command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR), unmanned air vehicles (UAV) systems, advanced electro-optics, electro-optic space systems, EW suites, airborne warning systems, data links and military communications systems and radios. The company also focuses on upgrading of existing military platforms and developing new technologies for defense, homeland security and commercial aviation applications.

RAFAEL **Rafael Advanced Defense Systems Ltd**

Develops and produces state-of-the-art armaments for the Israel Defense Forces (IDF) and Israel's defense system, while deriving

It's economic strength from international sales.

The company provides innovative solutions on the technological cutting edge from underwater, naval, land and air through space systems. RAFAEL focuses on such areas as

Electronic Warfare (EW), Command, Control, Communications, Computers and Intelligence (C4I), Training and Simulators, Armor and Precision-Guided Weapon Systems. The company has also formed partnerships with civilian counterparts to develop commercial

Applications based on its proprietary technologies.

RAFAEL is the second largest government-owned defense company in Israel, and in 2009 sales amounted to \$1.6 billion with a backlog of orders worth \$1.86 billion. At the end of 2009, the company made a profit of

\$112 million. RAFAEL comprises three divisions, which as a whole provide our customers with integrated

Systems and technologies for air, land, sea and aerospace defense solutions.



O.D.F. Optronics Ltd, part of the Wave Group Ltd. provides innovative vision-based systems for the Defense and Homeland Security and Consumer Electronics markets. O.D.F.'s unique products are based on its proprietary achievements in the fields of Omni-Directional Imaging, Advanced Electro-Optic Sensors, Remote Observation Systems, Image Processing and Image Understanding Software. The company's product lines include a wide variety of innovative products for Counter Terrorism, Military Reconnaissance, Low Intensity Conflicts (LIC), Homeland Security, Search & Rescue, Surveillance, Training Monitoring & after Action Review and Consumer Electronics applications. www.odfopt.com



Plasan provides customized survivability and armor solutions for tactical wheeled vehicles, aircraft and personal protection. A recognized global leader and industry veteran, Plasan's survivability solutions offer the optimal combination of protection, weight and cost by combining in-house R&D, design, prototyping and manufacturing capabilities.

Plasan combines innovative survivability engineering and design with advanced armor materials development. Its unique development process is based on continuous synergy between the R&D and the Design & Prototyping departments. During this process, Plasan combines computer-generated analysis and simulations with real-time calibration and ballistic test data. The effective combination of test and simulation data enables improved simulation accuracy and performance, resulting in the optimal armor solution.

As a global company with locations in Israel, North America and Europe, Plasan is a global market leader. Plasan's production capabilities are complemented by a comprehensive supply chain that encompasses suppliers of materials, equipment and solutions in strategic locations worldwide. This extensive network enables the production capacity flexibility necessary to expand production volumes according to demand. Please visit www.plasan.com



Specialized in develops, designs and manufactures high standard rescue equipment. Most of the tools are designed to operate by a single person (right /left handed). Independent needs no outer power source

Used for Breaching & Extrication, Breakthrough Rescue, Cutting & spreading.

Our exclusive product line is adequate as standard equipment at: Special army / police units, Fire brigades, Air and marine ports, Civil heavy industry electric power stations, Federal civil rescue authorities, Municipality authorities.

Hydrinoa has more than 32 different unique models: cutters, door busters, rams, bar busters, hydraulic/pneumatic pumps, spreaders.

Most of the products are international registered patent.



Ness Technologies

Ness Technologies (NASDAQ: NSTC and TASE: NSTC) is a global provider of IT and business services and solutions with specialized expertise in software product engineering; system integration, application development and consulting; and software distribution.

Ness delivers its portfolio of solutions and services using a global delivery model combining offshore, near-shore and local teams.

With about 7,800 employees, Ness maintains operations in 18 countries, and partners with numerous software and hardware vendors worldwide.

For more information about Ness Technologies, visit www.ness.com.

Ness TSG

Ness TSG is a leading global command-and-control, intelligence and telecommunications systems House.

With over four decades of experience, Ness TSG specializes in the development and integration of advanced, comprehensive solutions for the defense, homeland security, telecom, and utilities sectors.

Dedicated to delivering cutting-edge, best-of-class solutions, Ness TSG serves a diverse client base of private, public and governmental organizations worldwide. Ness TSG offers a one-stop-shop of products, systems and professional services for a range of military, paramilitary and telecom applications.

For more information about Ness TSG, visit www.ness.com/tsg



Shilat Optronics LTD.

Established in 2007 by former Israeli MOD electro-optics research department managers and engineers. Shilat Optronics team brings broad electro-optic solutions development and manufacturing experience, for military and surveillance equipment. Shilat is specialized in development electro-optic solutions for military and homeland security applications. Shilat has acquired vast expertise in taking on tailor-made projects introducing customer specific requirements. Most solutions relies on commercial components used in innovative electro-optic concepts enabling high performances while maintaining cost-effective solutions.

LVT- High Tech Fire Protection

A wholly owned subsidiary of Lehavot Fire Protection Ltd., founded in 1950, LVT benefits from Lehavot's extensive experience in the research and development of fire suppression systems. LVT's one stop shop offers custom designing, modeling, testing, and manufacturing of fire suppression systems for the military, industrial, and commercial sectors. Its cutting-edge technologies are designed to effectively protect lives, vehicles, equipment, and property keeping the crew safe while protecting the environment. The company's multi-zone fire protection systems meet a wide array of various fire risks, including solutions for vehicles, naval vessels and aircraft.

Its in-house fire testing complex is recognized by the Standards Institute and National Fire Commissioner and approved as a B-level supplier by the Ministry of Defense. All products meet stringent Israeli and international standards.



Astronautics

Established in 1971, Astronautics C.A. Ltd (Israel) is a well-known supplier of high quality, high reliability military and para-military products. Astronautics' products are field proven and in use by the Israeli Defense Forces, as well as other major Defense forces around the world. Among our customers are: IAF, IAI, Boeing, Lockheed, General Dynamics, Rafael, Elbit, Ruag LS, etc. Our products are in use in Airborne, Naval and Land applications. We specialize in Artillery Navigation and Pointing Systems, Fire Control Systems for artillery and tanks, Target Acquisition Systems, Advanced Military Computers, Land and Maritime Navigation Systems and networking communication systems based on the latest technology.

Astronautics' artillery Navigation and Pointing Systems are very accurate (less than 1 mil) and are mounted all over the globe on various platforms: Self propelled Howitzers, towed guns, mortars and MLRS.

Astronautics tactical computers and displays are in used in several land and maritime Remote Control Weapon Stations. Astronautics is certified to high quality standards and our products have excellent quality and high reliability. For more info please visit our website: www.astronautics.co.il



Senso Optics is a leader in the design, development and production of innovative thermal imaging technologies and advanced electro-optical solutions for military, law enforcement and security markets.

Senso Optics offers a wide range of targeting and visual information solutions for day and night missions. Its products can be easily customized and integrated into a variety of systems or operated as stand-alone units. Product lines include: Multi-sensor sights, fire control systems, hand held and vehicle mounted thermal imaging cameras, thermal upgrade kits, CCD cameras, border and strategic infrastructure monitoring solutions; thermal vision helmets for fire fighters and search & rescue units, as well as, thermal sensors and a wide range of thermal lenses. Senso Optics' thermal imaging technology is combat proven and has been acknowledged for its superior performance by the Israel Defense Forces. The company invests extensively in R&D and in advancing product maturity, while maintaining strict QA and environmental policies.

Senso Optics is committed to remaining at the forefront of thermal vision technology and being a leader in visual information and targeting solutions for the defense and homeland security (HLS) markets.



Urdan is widely recognized as a leading supplier of steel castings for commercial markets and for military applications, such as to the Israeli Defense Forces and other Western world armies. Urdan is firmly committed to quality, efficiency and customer satisfaction.

Urdan manufactures castings for industrial applications, including carbon steel, high and low alloys, manganese, abrasion-resistant steel, stainless steel, nodular iron castings and iron castings, from 3 kilograms up to 10 tons. The high-quality steel manufactured with Urdan's advanced technology, coupled with its strong engineering group, computerized castings design methodology and modern machining facilities, enable Urdan to offer castings and complete products for exclusive applications such as energy generation, marine applications, quarrying, water systems, chemical and food processing, motor vehicles, etc.

Urdan supports Israel's Merkava main battle tank and Namer APC programs, and supplies world-wide armor castings and assemblies for tanks and APCs.



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