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HIZBALLAH THREAT TACTICS REPORT COMING SOON!

by Angela M. Wilkins, TRADOC G-2 ACE Threats Integration (DAC)

TRADOC G-2 ACE Threats Integration will soon publish a new Threat Tactics Report (TTR). The report focuses on the threat actor Hizballah, and describes the group's evolution over time with details about its tactics. In addition, the TTR also discusses Hizballah's leadership and organization; its relationships with Lebanon, Iran, Syria, and Israel; the group's purpose and goals; and conditions that contribute to its strength. From the executive summary:

- Hizballah is a terrorist insurgent group based in Lebanon that has been active for approximately 33 years and now operates globally, with its focus still on Israel and the Syrian opposition.
- Hizballah aligns itself with Iran, Lebanon, and Syria, and against Israel. Its recent, direct involvement in Syria has tarnished the group's reputation among its followers in Lebanon.
- Parts of Beirut and southern areas of Lebanon serve as Hizballah's base, where it remains active and armed—with cooperation from the local population—and actively participates within the government.
- Hizballah has evolved through successful practices in financing, recruiting, logistics, and training.
- The Hizballah brand is pervasive and effective, particularly for recruiting and garnering support from the population and rallying the Lebanese people against Israel.

This unclassified report will be available on ATN along with previously published TTRs on ISIL, Boko Haram, Russia, China, Iran, Syria, and North Korea. Like all TTRs, updates will occur regularly. Any comments or questions can be directed to the author at angela.m.mcclain-wilkins.civ@mail.mil.

RED DIAMOND TOPICS OF INTEREST

by TRADOC G-2 ACE Threats Integration

The Russian Federation strongly objects to recent US measures that have established anti-missile defense systems on NATO's eastern flank in Europe and in close proximity to the ongoing conflict in Syria. The country's response was both swift and predictable, assuming the guise of a joint air defense system. This issue of *Red Diamond* opens with an article on the SA-21a Growler road-mobile surface-to-air missile (SAM) system, which would play an important role in this proposed joint air defense system.

In April 2015, the Afghan Taliban began its summer military operations in the north with a particular focus on Kunduz Province and its capital city, Kunduz. Over a period of months, the Taliban encircled Kunduz City and easily captured it in September 2015. An article provides details about the subsequent Taliban defense of, and eventual withdrawal under pressure from, Kunduz City.

An article explains Blueprint Four of the Threat 2025+ project, an ACE-TI initiative to produce a blueprint series capturing future threat tactics from a threat perspective for training. The blueprints are rooted in Training Circular (TC) 7-100.2, *Opposing Force Tactics*, and represent projected threat capabilities. The intent of the blueprints is to validate the current hybrid threat (HT) requirements for training and the current HT force structure at training centers Army wide. This article discusses one blueprint in detail, Mixed Force Defends in Complex Urban Terrain, and explains the conditions for its use in training.

Over the past few years, North Korea has test-fired a number of missiles in defiance of the United Nations' resolutions forbidding such actions despite ever-tightening economic sanctions placed on the country. The question that many observers ask is, "How much of a threat are North Korean missiles?" The next article attempts to answer this question, with discussion of the country's strategy and goals, its missile history and inventory, and a review of ten of its missile systems.

US Army Training Circular (TC) 7-100.2, *Opposing Force Tactics*, describes an opposing force (OPFOR) that exists for the purpose of training, professional education, and leader development for Army readiness. This training circular, as part of the TC 7-100 series, will be updated and electronically distributed by the end of calendar year 2017. The final Red Diamond article this month reviews basic OPFOR tactical concepts and expected changes to the document.

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Lethal Nexus

Geopolitics Meets Anti-Access, Area Denial (A2AD)

by Jim Bird (IDSI Ctr) and Jerry England (DAC), TRADOC G-2 ACE Threats Integration

The Russian Federation strongly objects to recent US measures that have established anti-missile defense systems on NATO's eastern flank in Europe, and also in close proximity to the ongoing conflict in Syria. Tensions increased significantly after the Russian invasion of the Crimea in March 2014 and again in November 2015, when a Turkish F-16 downed a Russian Su-24 Fencer fighter jet that was flying over Syrian territory.[1] Russian Deputy Prime Minister Dmitry Rogozin alleges that the real purpose of NATO's missile defense shield in Europe is "to deploy interceptor systems as close to us as possible."[2] Members of the Russian security establishment suspect that emplacement of the US MK-41 launcher system—now deployed in Poland and Romania—actually masks NATO offensive intentions, since the launch system is capable of employing Tomahawk cruise missiles that are potentially capable of targeting Russian intercontinental ballistic missile sites. A Foreign Military Studies Office analyst recently observed, "Some in the Russian security establishment have argued that if the emplacement of the MK-41 [*sic*: MK-11] launchers near Russia's border does not breach the letter of the 1987 Intermediate Range Nuclear Forces (INF) Treaty, it certainly breaches the spirit."[3]

Figure 1. The Sa-21a Growler air defense missile system

An Alliance of Their Own: Russian A2D2

Whether grounded in reality or paranoia, the Russian response to perceived US/NATO encroachments near its homeland and in the Middle East was both swift and predictable. It recently assumed the guise of a joint air defense system centered on the Commonwealth of Independent States (CIS), an association of countries first formed in 1991 by Russia and eleven other republics that were formerly part of the Soviet Union.[4] At a Moscow-hosted CIS summit held in December 2015, Russia and several other countries that once enjoyed closer relations with Turkey began laying plans for a Russian-Armenian defense agreement that potentially could impede Turkey's—and by extension, NATO's—access to the Caucasus and Central Asia. A former Russian military official suggested that because the US was using an airbase in Turkey under NATO auspices, it would be necessary to strengthen Russian and Armenian air defenses. The same official pointed out

that the initiative to form a joint air defense system was a first step in establishing an integrated air defense system (IADS) that potentially could include all CIS members.[5] This article focuses on the SA-21a Growler surface-to-air missile (SAM) system, also known as the Russian S-400 Triumf, depicted in the Worldwide Equipment Guide (WEG). The system first entered service in 2007 and was manufactured and delivered by the Almuz-Antey Group under a Russian state defense contract for arming the 18th Air Defense Missile Regiment.

Employment and Proliferation of the SA-21a Growler

Layered defense zones commonly called A2AD bubbles enhance a defender's ability to counter a larger array of adversary threats, and are typical of advanced air defense systems. According to analysts at the Institute for the Study of War (ISW), "the Baltic States, much of Ukraine and the Black Sea, northern Poland, Syria, and parts of Turkey fall under Russian A2AD bubbles created by the S-300 and S-400 air defense systems."[6] Although the modified ISW graphic shown in Figure 2 reflects deployments of both the SA-21a and the SA-23 Gladiator/Russian S-300 V4, the scope of this article is restricted primarily to the SA-21a.

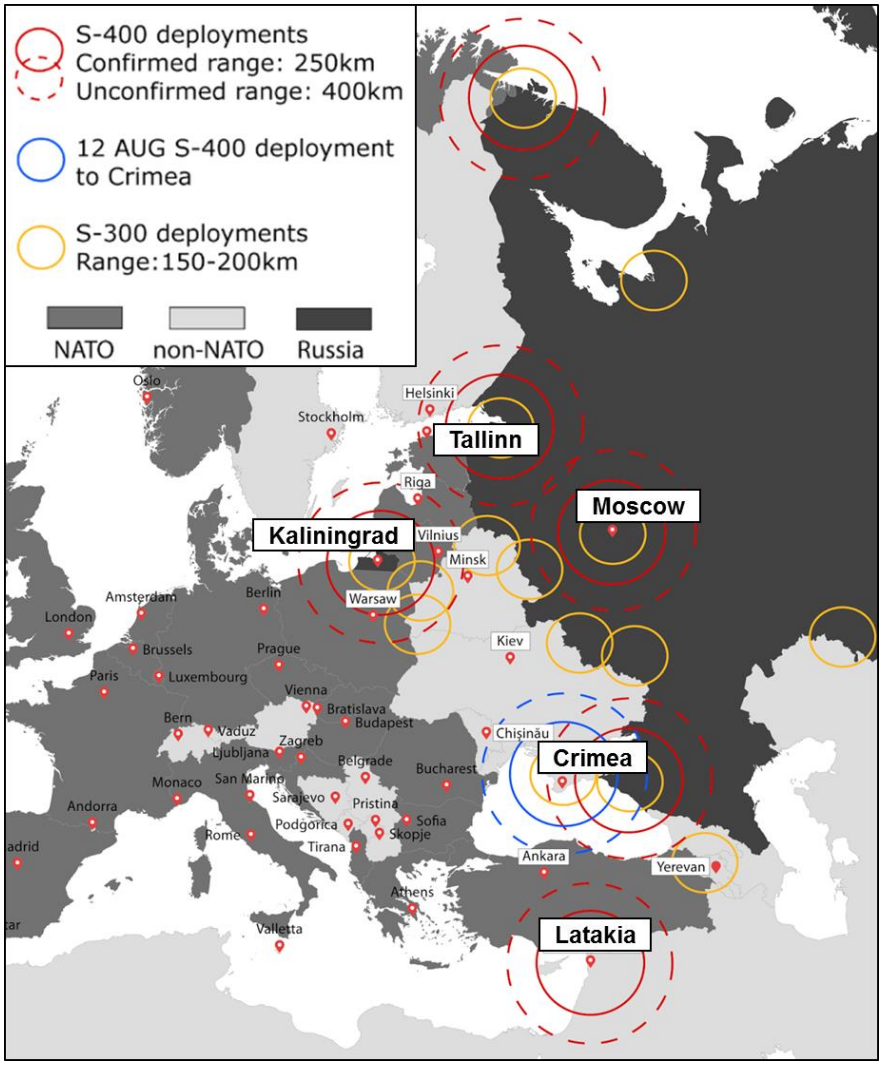

Figure 2. ISW map featuring S-400 Triumf deployment (modified by ACE-TI)

In July 2016, the Russian Tass news agency announced the impending delivery to the Crimea of a new regiment set of the SA-21a Growler anti-aircraft missile system, which arrived the following month at Feodosiya, Ukraine. The Crimea shipment post-dated deployment of the same system to the Hmeymim airbase in Syria's Latakia Province. The SA-21a is one of Russia's newest long-range anti-aircraft missile systems, capable of acquiring targets at a range of 400 km.[7] From its base in Latakia, the SA-21a battery could acquire targets throughout a geographical arch that encompasses much of Israel, the eastern Mediterranean, and a large piece of territory north of the Turkish-Syrian border. Meanwhile the same system, interlocked with others in a joint air defense network, poses a potential air defense artillery (ADA) threat to NATO allies from Armenia to the northern reaches of Europe. In particular, the road-mobile missile system is capable of acquiring hostile targets deep in Ukrainian airspace. The older SA-23 Russian surface-to-air missiles, already present on the Crimean peninsula before the arrival of the SA-21as, are expected to be gradually replaced by the newer model.[8]

Although the Crimea and the Middle East attracted the most media attention relative to deployment of the SA-21a system, China's long-term strategic relationship with Russia meant that it would be the first foreign recipient. In May 2015, Rosoboronexport officials announced the consummation of a contract with China that was originally signed in September of the previous year. In April 2016, the Russian Ministry of Defense (MoD) announced that a regiment recently equipped with the SA-21a had used it successfully to destroy drones in a simulated aerial attack conducted in the Far Eastern Kapustin Yar firing range. MoD spokesmen also indicated that several Russian regiments deployed in the Far East would

be replacing SA-23s with the newer SA-21as.[9] A senior Rand analyst called the SA-21a "the most dangerous operationally deployed modern long-range SAM in the world…The system can reportedly track 100 airborne targets and engage six of them simultaneously." Heath argues that depending on how China deploys this new ADA asset, "the system could influence the regional security order and dramatically impact the ability of the United States and its allies to respond to crises related to Taiwan, the Koreas, and the East and South China Seas."[10]

System Capabilities and Characteristics of the SA 21a Growler

Target sets vulnerable to the SA-21a include fixed wing (FW) aircraft, rotary wing aircraft, intermediated range ballistic missiles (IRBMs), cruise missiles (CMs), air-to-surface missiles (ASMs), unmanned aerial vehicles (UAVs), and artillery rockets. The missile's designers assigned a high priority to the following capabilities: defeating threats at low and very low flying altitudes; meeting the challenges presented by reduced electronic target signatures typical of modern aerial weapons systems, especially those employing stealth technology; coping with the increased number of targets that clutter the congested airspace over modern battlefields; addressing the widespread use of UAVs; survival in an environment endangered by precision guided munitions; and operating in an environment where adversaries may deploy tactical ballistic missiles (TBMs) and IRBMs.[11]

Some of the distinctive characteristics of the SA-21a relative to its ADA predecessors include radar and software refinements and the addition of four new missile types not found in earlier versions. As a result, an SA-21a battery could be configured to contain a mix of missiles tailored to meet the needs of air defenders operating in a specific threat environment. Most modern IADS are heavily dependent on sophisticated radar equipment, so greater range capabilities sought by SA-21a designers warranted a significantly-upgraded transmitter tube to provide the higher-power aperture capability of supporting radar systems, as well as improved exciter and automatic frequency-hopping capability. Each battery-level unit comes equipped with three MZKT-7930 mobile erector launchers, each supported by a 22T6-2 loading crane.[12]

The SA-21a missile system reflects a high level of "plug-and-play" capability: built-in modularity designed to allow incorporation and exploitation of future technological innovations. At the same time, its multirole capabilities also permit integration with existing/legacy IADS technologies. The SA-21a is suitable for defending stationary infrastructure targets as well as units on the move. Its capabilities also include using currently operational legacy missile warheads typically found in existing inventories of export customers. The system consists of the following basic components: (1) the 30K6E battle management system that employs the 55K6E command post and 91N6E Big Bird acquisition radar; (2) up to six 98Zh6E firing sections, each equipped with a 92N6E Grave Stone multimode engagement radar; (3) up to 12 transporter erector launchers (TELs), each armed with up to four 48N6E2/E3 missiles; (4) a basic load of SAM missiles carrying a tailored mix of 48N6E, 48NE2, and 48N6E3 munitions; and (5) an organic logistical support system that facilitates missile storage as well as testing and maintenance equipment.[13]

The SA-21a communications and networking systems are designed to dovetail with IADS that employ radio-frequency and landline links, including those that use analog telephone cables. The system's 98Zh6E fire units can be deployed up to 100 km from the parent 55K6E self-propelled command post. The 91N6E Grave Stone radar can be installed on a mobile mast system for operating in complex urban or heavily forested terrain. Interfaces and software built into the SA-21a allow data-stream feeds and/or exchanges with redundant 91N6E Big Bird acquisition and battle management radars; state-of-the-art 96L6E mobile acquisition radars; 67N6 Gamma DE acquisition radars; 59N6 Protivnik GE acquisition radars; and a variety of command post configurations.[14]

Figure 3. Russian 96LE target acquisition radar

In addition to its ability to interface with IADS employing the further acquisition emitting radars discussed above, the SA-21a has also successfully linked with passive emitter-locating target acquisition systems, including two currently published in the Worldwide Equipment Guide: the 1L222 and

the 86V6 emitter locating systems. These target acquisition radars can lock onto targets emitting electronic signatures while avoiding detection by an adversary's suppression of enemy air defense systems. The enemy remains unaware of the 1L222 or 86V6 presence until the state-of-the-art further acquisition emitting radars are switched on at the last moment, too late in the engagement cycle to take evasive action.[15]

Training Implications

Ever since a short-lived period of research and development torpor that prevailed during the Operation Desert Storm era and the Soviet collapse that followed shortly afterwards, the Russian Federation has been diligently working to erode the US technological advantage in conventional equipment and weapons systems. Nowhere is this more apparent than in the burgeoning arena of electronic warfare (EW) and related subjects, especially rapidly-evolving stealth technologies. As part of their 10–15-year-long drive to exploit hybrid war venues, the Russians are investing tremendous resources into high technology research and development. The potential modern ADA systems hold for degrading adversaries' communications and computer systems and suppressing enemy air defense capabilities presents the Russians with a viable way forward in closing the conventional armaments gap with the US and its NATO allies. The Russians are known to be exploiting current operational environments in the Syrian civil war and the Ukraine as opportunities to expand their A2AD envelopes and capabilities.

The Russians are well aware that the modern battlefield is a networked, computerized, satellite-centric environment, and that over time US forces have developed a comfort level that tends to render them accustomed to, if not overly dependent on, the technological edge that such environments have afforded them in the past. The luxury of guaranteed friendly air superiority that deployed Army units have enjoyed in recent decades may be coming to an end. In the past, the Air Force enabled ground forces by first shaping the battlefield, then using close air support to help units in contact. In the context of the Syrian theater of operations, however, Timothy Heath argues that had it chosen to do so, Russia "could have…neutralized the effectiveness of U.S., French, or NATO aviation based in the Mediterranean," thanks to the dangers presented by the SA-21a deployment.[16] In future conflicts, US forces may be forced to either operate outside the A2AD envelope of enemy IADS, or use innovative approaches to neutralize them. Such innovative approaches might reasonably include long-range raids by special operations forces directed against ADA sites as part of a shaping campaign.

The US Army can use training to good advantage as a way to counter the ongoing Russian technological advancement efforts. Units can train to cultivate an ability to work in a degraded communications environment that demands sound countermeasures and workarounds to compensate for an absence of air superiority. Emphasis is warranted on sustaining an ability to continue the mission in an externally-imposed analog environment wherein digital communications and computer networks have been degraded by the opponent, or powered-down as a force protection measure. It is highly probable that the Russian Federation will continue to develop and refine its capabilities and tactics in all EW-related venues, including air defense capabilities. It is also vitally important that trainers enable soldiers to function effectively in ways that anticipate technological ADA advances made by potential US adversaries.

Russian SAM System SA-21a/GROWLER/S-400[17]

Missiles	Typical Combat Load
TEL and trailer launcher	7
40N6	
(with 1x 9M96E2 canister)	3
	Near Term 2
9M96M/E2	4
("small missile")	Near Term 8
SA-18S MANPADS	2

SYSTEM	SPECIFICATIONS	ARMAMENT	SPECIFICATIONS
Alternative Designations	Triumf, Triumph as a translation	Name	91N6E2 BIG BIRD E It is an improved SA-20B EW/TA radar, with an AD intel processing center on a MAZ-7930 towed van trailer, co-located with the brigade CP/battle management center. See 64N6E at SA-20a.
Date of Introduction	2007	Detection Range (km)	At least 400
Proliferation	Fielded in 1 country	Azimuth Coverage (°):	360
Target	FW, IRBMs to 3,500 km, heli, CM, ASM, UAV, and artillery rocket	Name	Nebo-SVU/1L119 This VHF target acquisition radar is at Brigade level. The first search priority is stealth aerial systems. Because of limited sector coverage, it is likely that up to 4 will be used.
Primary Components	Group/brigade 2-8 bns and 91N6 E2. Each bn has 6-12 trailer launchers (TLs, aka mobile erector-launchers or MELs) , 55K6E 8x8 van, 5T58-2 SAM transporter, 22T6-2 loading crane, and radars. Battery (firing unit) has 3 TLs.	Name	96L6E TA radar/battle mgt center is initially at bn until 59N6 replaces it.
ARMAMENT	SPECIFICATIONS	Name	59N6/Protivnik-GE
Trailer Launcher (TL) or MEL		Function	All-altitude target acquisition and Unit Associated With: Battalion (2-6 btry)
Name	5P85TE2	Unit Associated With	Trailer with KrAZ-260 tractor
Tractor	BAZ-64022 6x6 tractor	Mobility	Trailer with KrAZ-260 tractor
Missiles per Launcher	3 x 40N6 4 x 9M96E2 (current likely mix)	Operation	Digital links to battery, battalion, and brigade/IADS processing center
Automotive Performance	For 5P85TE2 TL	Emplacement/Displacement time (min):	15
Cruising Range (km)	800 (est)	Range (km):	400
Road/ Dirt Road Speed (km/h)	60/30 (est)	Targets Tracked Simultaneously	up to 150
Missile		Frequency Band	AESA Decimetric L-band, 3-D phased-array
Name	40N6 “big missile”	Azimuth Coverage (°):	120, 360 with rotation
Type	Solid-fuel	Name	92N2E
Launch Mode	Vertical launch	NATO Designation	GRAVESTONE
Launch Range (km)	5-400	Function	Dual (TA/FC) radar vehicle and CP
Max Range TBMs	40	Unit	Battery (SAM system), for 3 launchers
Targets	28-48	Mobility	MAZ-7930 8x8 van
Altitude (m)		Detection and Guidance (km)	400 auto-track

Max Altitude	**0,000+**	**Targets Engaged Simultaneously**	**up to 6 (est)**
Min Altitude	**5, 0 with blast radius**	**Missiles Guided Simultaneously**	**up to 12 (est)**
Speed (m/sec)		**Frequency Band**	**I/J, 3-D phased array**
Max Target	**5,000**	**Azimuth Coverage (°):**	**120, 360 with rotation**
Max SAM	**4,800**		
Dimensions			
Length (m)	**7.5**		
Diameter (mm)	**519**		
Weight (kg)	**2,000, 2,800 in canister**		
Guidance	**Track-Via-Missile, missile active radar homing, home on jam**		
Warhead Type	**Frag-HE**		
Warhead Weight (kg)	**180+**		
Fuze Type	**Radio command**		
Probability of Hit (Ph%):	**90 FW. 80 heli**		
Simultaneous missiles	**up to 2 per target** **(doubles probability of hit)**		
Name	**9M96E2/9M96M "small missile."A canister of 4 can fit on the SA-21 launcher in place of a big missile. It is possible that most launchers in most batteries (by the Near Term) will have 2 canisters of small missiles (8 total).**		
Other Missiles	**The system can also launch older missiles for SA-10 and SA-20 systems. There are reports of a 48N6DM missile, which offers longer range than the 48N6. This may have been an interim missile for use until 40N6 was fielded.**		

OTHER ASSETS

THE SA-21A DIGITALLY LINKS TO THE IADS, AND SHARES DATA WITH OTHER UNITS IN THE NET. FOR DISCUSSION OF OSNOVA-1E IADS C2 VEHICLE, BAIKAL-1E, RUBEZH-2M, 83M6E2 AUTOMATED C2 SYSTEM , AND OTHER ASSETS. FORWARD OBSERVERS ARE DEPLOYED THROUGHOUT THE COVERAGE AREA. EACH BRIGADE ALSO HAS AN 85V6E/ORION ELINT.

AN IADS DIGITALLY INTERFACES THE NEBO-SVU COUNTER-STEALTH RADAR SYSTEM, PROTIVNIK, AND 96L6E, TO OVERLAY DETECTIONS.

A RECENT COUNTER-STEALTH RADAR SYSTEM IS THE NEBO-M MOBILE MULTI-BAND SYSTEM, WITH THREE VEHICLES. RLM-D HAS L-BAND RADAR. RLM-S HAS X-BAND. RLM-M HAS A VHF RADAR, SIMILAR TO NEBO-SVU. THE SYSTEM IS SPECIFICALLY DESIGNED AGAINST STEALTH AIRCRAFT AND F-35. A RECENT RUSSIAN CONTRACT CALLS FOR 100 SYSTEMS TO REPLACE NEBO-SVU IN SA-20B/S-400 UNITS, AND WILL BE INCLUDED IN SA-23/S-300V4 UNITS.

VARIANTS

THE S-400 SERIES USES A NEW ARRAY OF TRUCKS, TRACTORS, AND TRAILERS. DUE TO S-400 PRODUCTION DELAYS, THE SA-20 SERIES WAS CONFUSED WITH IT. MANY S-400 UPGRADES CAN BE APPLIED TO SA-10, SA-12, AND SA-23. CHINA IS ORDERING SA-20B AND UPGRADING OTHER LAUNCHERS TO SA-20B CAPABILITY.

S-400/SA-21A: THE SYSTEM WAS FIELDED IN 2007 WITH RUSSIAN VEHICLES. EARLY UNITS ARE STRATEGIC AND USE ONLY 40N6 400-KM BIG MISSILES. MOST LAUNCHERS CAN ALSO MOUNT CANISTERS OF 9M96 SERIES SMALL MISSILES.

SA-21B/S-400M/SAMODERZHETS: UNLIKE THE OTHER. SAMS, SA-21A'S 40N6 WILL RANGE 400 KM.

NOTES

THERE ARE ALSO REPORTS OF A SYSTEM IN DEVELOPMENT CALLED S-500, WITH LONGER RANGE AND A DESIGN VELOCITY OF 10,000 M/S. NO DETAILS ARE AVAILABLE. THE PHASED-ARRAY RADARS FEATURE LOW DETECTION, AND HIGH JAM RESISTANCE.

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by Rick Burns, TRADOC G-2 ACE Threats Integration (BMA Ctr)

In April 2015, the Afghan Taliban began its summer military operations in the north with a particular focus on Kunduz Province and its capital city, Kunduz. Over a period of months, the Taliban encircled Kunduz City and easily captured it on Monday, 28 September 2015. The fall of the city represented the biggest military victory for the Taliban since 2001.[1] This article provides details about the Taliban defense of, and subsequent withdrawal under pressure from, Kunduz City. The recently-published *Threat Action Report: Taliban Take and Lose Kunduz* provides a detailed analysis of the attack and the subsequent retaking of Kunduz by Afghan security forces, supported by NATO-led Operation Resolute Support assets.

Prior to the successful attack on Kunduz, the Taliban gained control of key ground surrounding the city. Taliban strength in the areas surrounding Kunduz allowed it to delay Afghan security forces' attempts to rush reinforcements to the city. As Afghan forces moved toward Kunduz from other areas, Taliban elements engaged in harassment ambushes, frustrating attempts to support the besieged security forces held up at the airport south of Kunduz. The Afghan government attempted to move troops and ammunition north from Baghlan to Kunduz, as an example, but Taliban roadblocks and ambushes along the route stalled the movement. Taliban attacks along other supply routes further hindered Afghan security forces from reaching Kunduz quickly.[2]

On Tuesday, 29 September 2015, following their quick occupation of Kunduz, Taliban assault elements seized the momentum gained and attacked the airport. The Taliban claimed it temporarily penetrated the airport perimeter, while government sources stated its defense of the airport held. Each side had a vested interest in shaping the information warfare narrative to its benefit and published conflicting reports of casualties and what was happening on the ground.[3]

In consultation with surprised and concerned Afghan leaders, NATO's International Security Assistance Force (ISAF) deployed air assets beginning on Tuesday, 29 September 2015.[4] As Taliban elements intermingled with the Kunduz population, bombing targets became more difficult. During an air attack on 3 October, an AC-130U Gunship aircrew attacked a *Médecins Sans Frontières* (MSF; Doctors without Borders) trauma center, causing both damage to the hospital and killing and injuring of innocent staff and patients.[5]

To defend itself within the city, the Taliban prepared an area defense with combat security outposts (CSOPs) intended to protect key avenues of approach.[6] The CSOPs allowed for flexibility in choosing between several different missions. The relatively small number of Taliban defenders knowingly faced a significantly larger Afghan security force with the inevitable support of ISAF. Despite its ease in taking the city of Kunduz, the Taliban likely realized it would not be able to hold the city indefinitely; particularly as Afghan security forces slowly recaptured portions of the city over subsequent days. The CSOPs played a critical role in providing early warning, delaying entry into the city, and causing casualties to the Afghan security forces before the Taliban would eventually relinquish control back to the better-armed and -resourced Afghan security forces supported by ISAF. [7]

While Afghan security forces controlled major portions of Kunduz by the first days in October, Taliban resistance resulted in heavy street fighting before the government forces finally wrested control of the city from Taliban fighters. Taliban elements took advantage of the time it took the Afghan security forces to finally take the city by placing improvised explosive devices (IEDs) and other obstacles throughout the city and within buildings to challenge, delay, and increase the number of security force casualties. The Taliban divided itself into elements of 10–12 fighters each, using civilian houses and tops of high-rise buildings from which to fire on Afghan security forces. Street fighting devastated large areas of Kunduz, destroying shops and homes.[8]

Before withdrawing under pressure, Taliban elements attempted to destroy key infrastructure necessary for governance, public services, and security. On 12 October, Afghan security forces prevented several attempts to destroy the Chardara and Alchin bridges. Destruction of these bridges would have further isolated Kunduz from reinforcements in the surrounding districts and denied it road networks to other areas of Afghanistan.[9] In other areas, the Taliban was more successful. It left in its wake looted and destroyed electricity and water infrastructure, police stations, government buildings, and businesses. In addition to looting the Central Bank, Taliban elements bombed other banks in the city. The Taliban dealt a significant and lingering blow to the Afghan government as it now has to rebuild the infrastructure and the trust of the city's residents.[10]

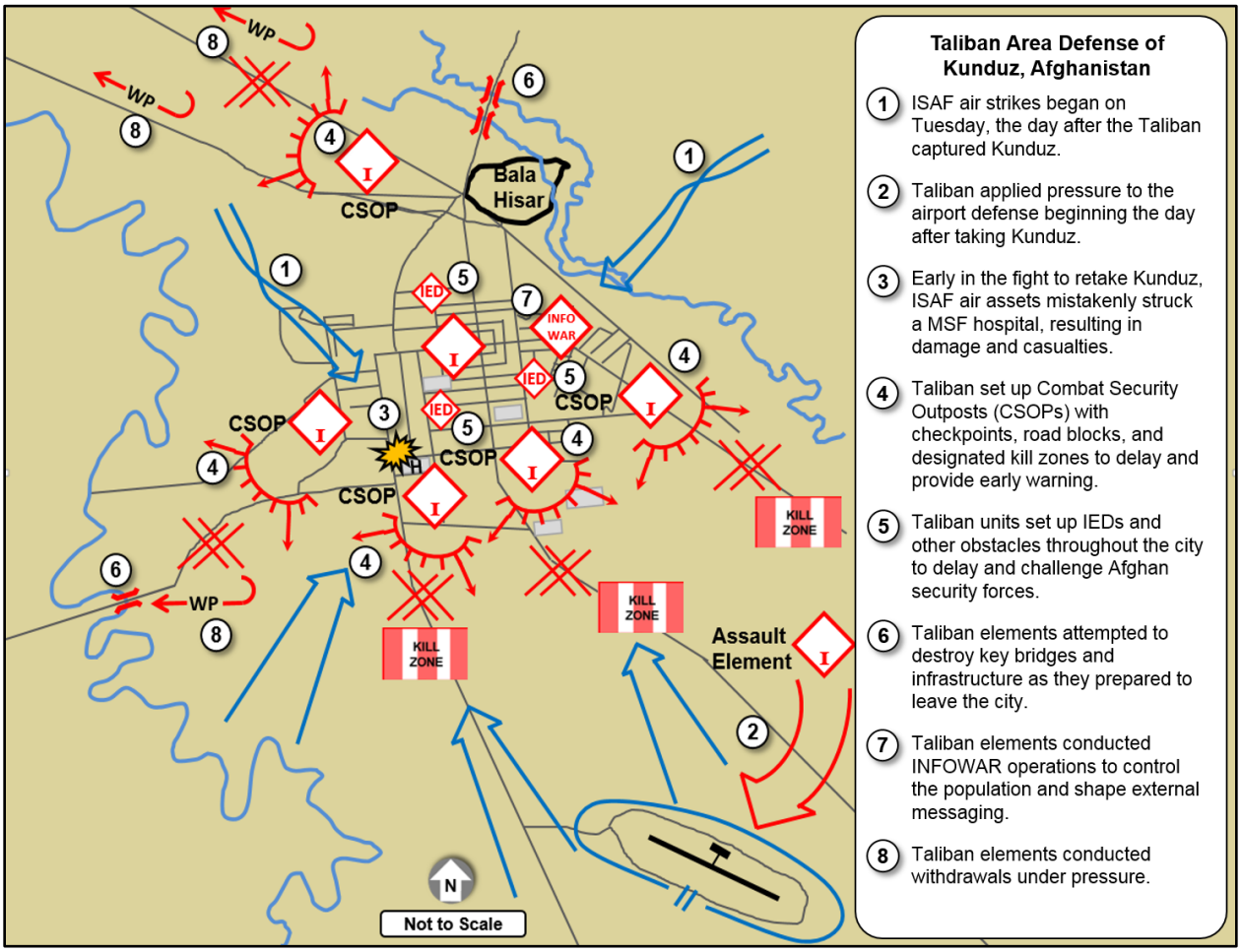

Figure 1. Taliban area defense of Kunduz

On 13 October 2015, over a week after the Afghan government had initially announced its victory over the group, the Taliban published on its website that it had withdrawn its fighters from Kunduz.[11] A Taliban spokesman stated the "fruitless cost of corporeal and material losses to Mujahideen in the protracted battle in defense of Kunduz City" prompted it to withdraw to the rural areas outside the city.[12] The Taliban stated it had "ordered its mujahideen to withdraw from the main square, markets and government buildings to the outlying rural areas...in order to reinforce their defense lines and reserve their strength for effective future operations."[13]

In another statement, a Taliban spokesman outlined what he considered to be the successes of the short-lived occupation of Kunduz:

1. Taliban elements conducted "a well-organized operation on Kunduz city and within a few hours broke through enemy defenses and took over the entire city barring the airbase;"
2. From the prison it released hundreds of "Mujahideen and other innocent individuals accused of supporting Jihad;"
3. The operation caused "a wave of panic in the enemy ranks" by occupying a regionally strategic and command center;

4. Before withdrawing from Kunduz, the Taliban "Seized military equipment, APCs, launchers, tons of heavy and light arms ammunition;"
5. Taliban fighters obtained "archived documents from the ministry of national directorate services and other organs;"
6. The Taliban proved that it could achieve its objectives in "every part of the country" even with foreign militaries stationed in Afghanistan; and
7. The operation resulted in minimal Taliban losses and civilian casualties "were also kept at a bare minimum." [14]

Taliban fighters left the city of Kunduz, but returned to area strongholds in the districts surrounding it from which they continue to apply pressure on Kunduz. On 20 August 2016, Kunduz was on the verge of capture yet again. A similar picture developed with civilians and leaders retreating to the airfield to the south as Taliban elements threatened from the captured Khanabad district to Kunduz's east as well as from positions on the north side of the city. Reports indicate that the Taliban tried to destroy a key bridge connecting the city to Tajikistan, which would have left the Baghlan-Kunduz highway— temporarily blocked by the insurgents in the morning—as the only major road out of Kunduz. As a precaution and wanting to not repeat the events of September 2015, Afghan security officials moved prisoners from the prison to the airfield. This time, despite complaints of air support and ground reinforcements being slow to arrive, Afghan security forces repelled the attack.[15]

The failure of the Afghan security forces to adequately clear the areas surrounding Kunduz continues to cause lingering security challenges for the city. As the Taliban withdrew under pressure from Kunduz, it simply flowed back into places of strength in the rural areas surrounding the city. The Taliban met its objectives by temporarily occupying a major city and could afford to lose territory even as it continued to threaten other areas. The definition of success is different for the Afghan government and the Taliban. Even when victorious against the Taliban, the government can still appear to be weak and unable to protect its citizens; a situation that the Taliban can exploit, especially in the media.

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by MAJ Jay Hunt and Jerry England (DAC), TRADOC G-2 ACE Threats Integration

The Threat 2025+ project is an ACE Threats Integration initiative to produce a series of blueprints for the purpose of capturing current and future threat tactics from a threat perspective for training. The blueprints are rooted in Training Circular 7-100.2, *Opposing Force Tactics* and are a representation of projected threat capabilities. The intent of the blueprints is to validate the current hybrid threat (HT) requirements for training and the current HT force structure at training centers Army-wide. This article is the fourth in a series that will discuss the threat blueprints and the combat conditions they are representing. It will also highlight what elements of threat tactics are most relevant when given a set of combat conditions and a hybrid threat mission against a US brigade.

Threat Blueprint Four: Mixed Force Defends in Complex Urban Terrain

Blueprint Four conditions focus on an opposing force (OPFOR) mixed brigade tactical group comprised of a motorized infantry battalion, a guerrilla battalion, and a local insurgent group. The forces of this hybrid threat are defending in a complex urban environment in which they have a stronghold in the center of the city. The HT has used this city as a regional base of operations, but due to ongoing enemy air strikes and HT information warfare (INFOWAR), the bulk of the population has evacuated the war-torn area. The urban area is in a valley bounded by mountains to the north and south. The main approach is from the west, with a secondary approach from the east.

Type of Defense: Tactical Area Defense

The HT conducts a tactical area defense in simple battle positions along the most likely avenues into the perimeter of the city. The HT preserves its forces and capabilities held in its urban stronghold to enable its continued use as a regional base of operations.

The HT's center of gravity is its sustainment, communications, and C2 assets in a complex battle position (CBP) in the urban support zone. The mission of the HT's conventional forces is to deny the enemy access to the urban interior. This will be accomplished by occupying simple battle positions along the most likely avenues of approach (east-west) and conducting antilanding operations against possible airmobile operations north of the city. The HT will use extensive countermobility preparations, air defense ambushes, and observation posts to counter the perceived overmatch of the attacking enemy.

Functional Tactics: Maneuver Reserve

One regular motorized company will comprise the base unit for the maneuver reserve. The maneuver reserve will mobilize to conduct a number of missions including but not limited to counterpenetration, antilanding, and deception operations in order to extend the battle zone and disrupt the enemy's attack. The maneuver reserve is employed when unforeseen opportunities or contingencies are present.[1]

The maneuver reserve will support success and assist in areas it believes it can be decisive. When task-organized as hunter-killer teams or as urban detachments, the maneuver reserve can assist in defense, lead a counterattack, or organize stay-behind forces' disruption activities in the enemy's rear area. The maneuver reserve can also be a part of the deception plan by masking its capabilities and intentions until conditions present a window of opportunity.[2] The key is mobility and flexibility: if the reserve commits to a long fight, it will cease being useful as a flying column.

The guerrilla forces' mission is to support the area defense by conducting ambushes along the avenues of approach beyond the range of the conventional forces. These attacks are intended to inflict casualties and force the enemy to assume a non-optimal formation and culminate prior to entering the kill zones of the HT motorized forces.

The insurgent forces support the guerrilla operations with specialized capabilities—such as improvised explosive devices (IEDs)—and a sophisticated intelligence network throughout the region. Within the city, the insurgents are prepared to conduct ambushes against any enemy forces that penetrate or infiltrate into its interior. They are also responsible for the ongoing deception operations related to the specific location and composition of the CBP and the assets within.

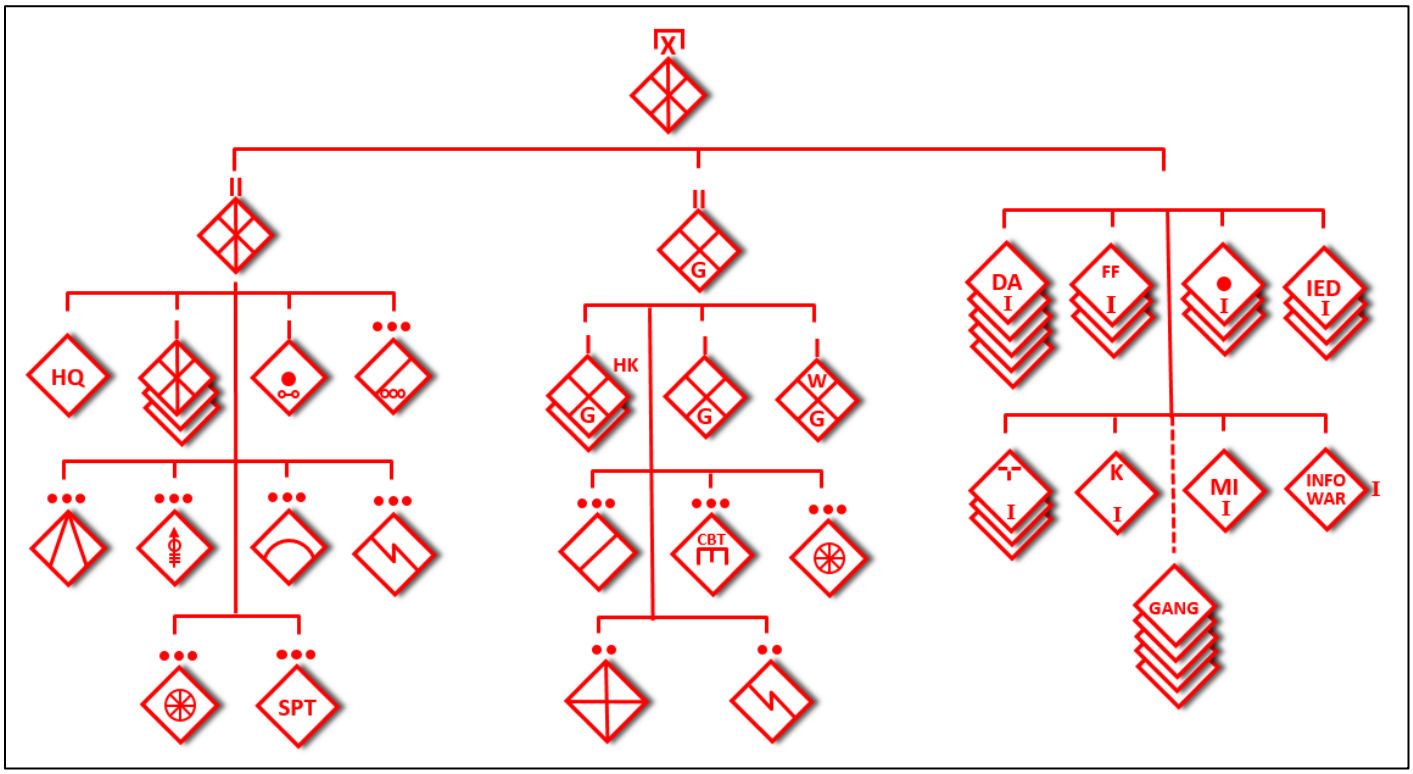

Figure 1. OPFOR order of battle

Functional Tactics: INFOWAR

The local villages are culturally more open to pro-HT and anti-enemy perception management efforts. The HT will use this to its advantage and guide the locals to hinder—or at least not help—the invading enemy forces. The HT will leverage the most amenable locals to provide intelligence on enemy positions and movements. Where possible, the irregular forces will push noncombatants to civil disruption and demonstrations.

The HT will use electronic warfare and deception to disrupt enemy command and control (C2) traffic and sow confusion. INFOWAR activity positioned near the support zone will serve to deceive enemy elements and deny their sensors from collecting on the HT CBP in the support zone. One of the most important functions of the electronic deception effort is to pass false information about the HT C2 location within the city.

The HT will manipulate video of the enemy to enhance the narrative of enemy atrocities, which will be disseminated via the Internet. Regional media will be inundated with anti-enemy/pro-HT messages to reduce enemy strategic effectiveness in the region.

Functional Tactics: Air Defense Ambush and Antilanding

The HT anticipates that the enemy will attempt to bypass the main west-facing defense by conducting an air assault to the city's north and/or east. Air defense ambush teams will be deployed along the most likely air avenues. Multiple observation posts (OPs) on each identified avenue will identify routes and strengths. This will allow the HT to shift focus and deploy its reserve motorized company as needed.

Concealed antilanding obstacles and countermobility preparations at anticipated landing zones will make deploying air-mobile troops and equipment difficult and costly. Defenders will destroy the troops on the ground with indirect and direct fires, leveraging the terrain and buildings to conceal their positions.

Functional Tactics: Disruptive Fires, CSOPs, and Ambushes

Taking advantage of the few viable avenues of approach, the HT will mass indirect fires at preplanned locations as the situation dictates. Fire positions will maximize camouflage, concealment, cover, and deception (C3D), and use protected sights such as schools and hospitals whenever feasible. Fires will focus on the most lucrative enemy targets, such as key systems or vulnerable troops. OPs and relatively-clear fields of fire enhance the accuracy and effectiveness of the indirect fires (IDF) as the enemy moves toward the city.

Combat security outposts (CSOPs) will be deployed along the most likely avenues of approach to prevent penetration by enemy reconnaissance. Prepared obstacles and direct fires will force the enemy to prematurely deploy, lose momentum, and be exposed to the IDF as long as possible. In addition to inflicting losses, the delay of the enemy will allow the HT forces to refine their defenses based on actual enemy strength and disposition.

Irregular forces will conduct harassment ambushes along the routes and in the villages on the western avenues. These will include improvised obstacles, small arms fires, IEDs, and noncombatant blocking actions. The irregular forces will also provide early warning and intelligence on advancing enemy elements.

Functional Tactics: Delay and Withdraw with Prepared Kill Zones in the City

Defenders in battle positions on the city perimeter will ambush enemy security elements in the disruption zone as they move to support the enemy attack into the city. Support from HT antitank teams will canalize the enemy into prepared kill zones, preventing his freedom of movement. The intent is to continue to inflict heavy casualties on the enemy while protecting the HT support zone until the enemy decides his objective is unattainable. In addition to prepared battle positions within the city, the HT will employ ambushes and prepared or improvised obstacles to counter any enemy progress into the city interior. Operational security, discipline, and alternate positions must be used to prevent the enemy from identifying and targeting the CBP with air assets or IDF.

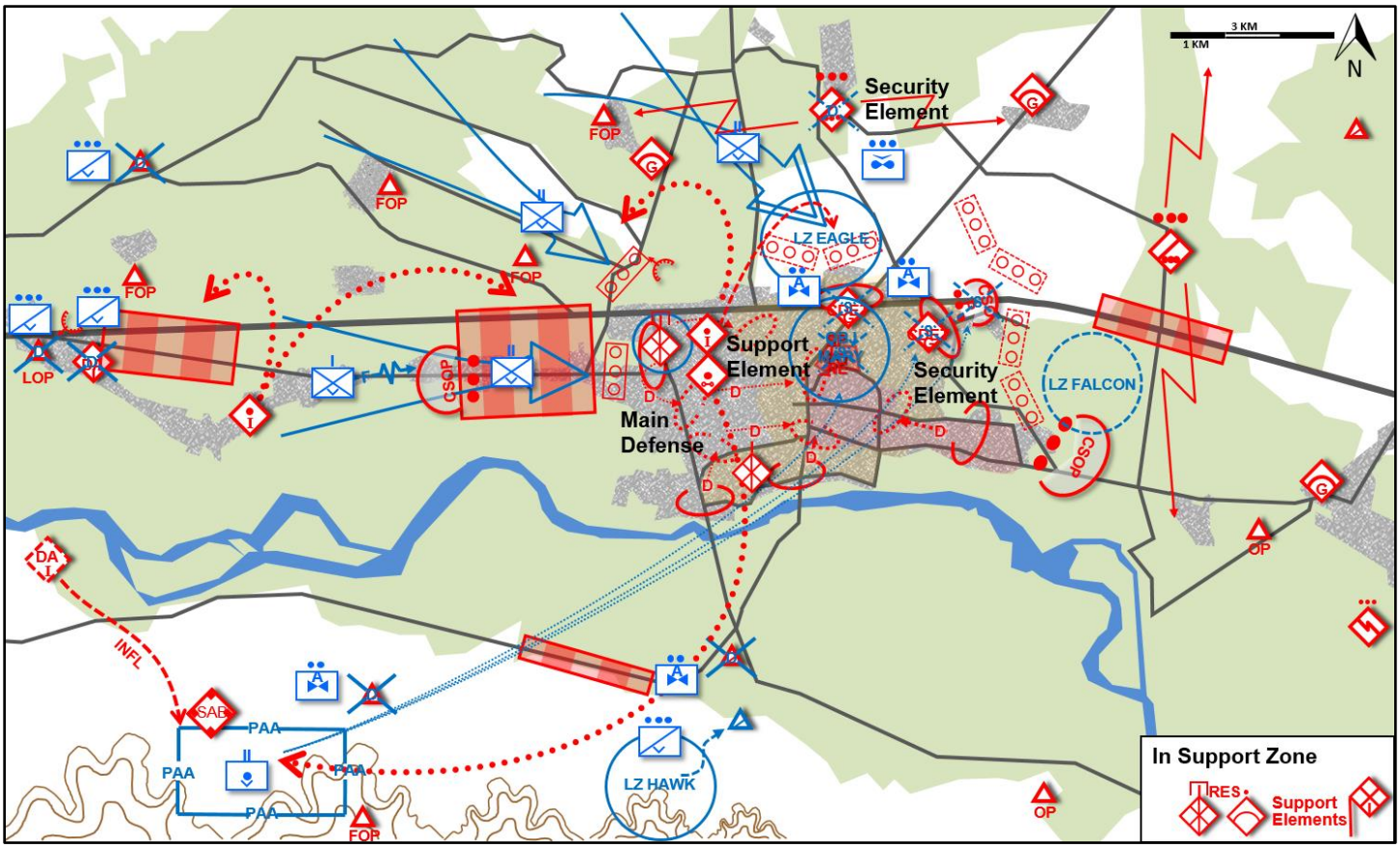

Figure 2. OPFOR area defense

Implications for Training

- Dispersed firing positons that use C3D, human shielding, and cultural standoff will protect HT indirect fire and antiaircraft weapons from immediate destruction. Forces that apply functional analysis of probable artillery positions based on opponent capabilities and concealment techniques can improve targeting of HT capabilities.
- HT INFOWAR activities create complicity in the local population, resulting in the blurring of lines between combatants with noncombatants. Forces that exploit the relationship between the HT and the local population can disrupt HT activity and degrade local support.
- The maneuver reserve provides the HT with flexibility in exploiting opportunities. Preplanned missions such as counterpenetration, antilanding, and deception are designed to support the defense. The reserve will reinforce in areas where its presence is decisive or where it believes the enemy is weak. Forces that recognize the HT criteria for deploying the reserve can disrupt its mission.

Notes

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by H. David Pendleton, TRADOC G-2 ACE Threats Integration (CGI Ctr)

Over the past few years, and especially in 2016, the Democratic People's Republic of Korea (DPRK; also known as North Korea) has test-fired a number of missiles in defiance of the United Nations' (UN) resolutions forbidding such actions and despite the ever-tightening economic sanctions placed on the country by the international community. The question that many observers ask is, "How much of a threat are North Korean missiles?" The answer to that question depends on (1) one's geographical proximity to the Korean peninsula; (2) whether DPRK scientists will find a way to mount a nuclear weapon on an operational missile; and (3) the potential for a North Korean launch of one or more missiles against a perceived enemy. This article will discuss the North Korean missile program's history and its relationship to the DPRK nuclear program; the most recent actions taken by North Korea in defiance of international constraints; and the DPRK's capacity to launch a missile strike against targets in South Korea, Asia, the Pacific, and the western US states.

Table 1. Pre-2016 North Korean nuclear and missile testing events[1]

12 MAR 1993	DPRK threatens to withdraw from the Nuclear Nonproliferation Treaty (NPT)
13 JUN 1994	In return for US aid, DPRK freezes its plutonium weapons program
DEC 2002	DPRK withdraws from the NPT and resumes its nuclear program
APR 2003	Six-Party (China, Japan, DPRK, Russia, South Korea, and the US) talks begin
19 SEP 2005	DPRK pledges to abandon its nuclear weapons programs and return to the NPT
9 OCT 2006	First nuclear test: less than one kiloton
FEB 2007	Six-Party talks reach an agreement on implementation steps; DPRK continues to miss deadlines
4 APR 2009	DPRK conducts missile test
25 MAY 2009	Second nuclear test: two kilotons; DPRK withdraws from Six-Party talks and refutes previous agreements
13 APR 2012	Satellite launch attempt fails just after liftoff
12 DEC 2012	Successful satellite launch
12 FEB 2013	Third nuclear test: 6–7 kilotons
21 MAR 2014	Thirty short-range rockets fired off east coast
26 MAR 2014	Two MRBMs fired into the Sea of Japan
27 JUN 2014	Three SRBMs fired off the east coast
6 SEP 2014	Three SRBMs fired off the east coast
8 FEB 2015	Five SRBMs travel 200 km off the east coast
13 MAR 2015	Seven missiles fired off the east coast
7 APR 2015	NORAD commander claims KN-08 operational
9 MAY 2015	DPRK claims to have successfully launched a submarine-launched ballistic missile (SLBM)
28 NOV 2015	SLBM test fails
21 DEC 2015	SLBM test; DPRK claims success

DPRK Strategy and Goals

The DPRK has three ultimate goals: the unification of the Korean peninsula under the Kim family's control, North Korea remaining an independent state without outside interference, and for the Kim family to remain in power.[2] The pursuit of nuclear and missile technology by North Korea is a method to pursue its second goal due to fear by the international community of a nuclear war between North Korea and one of its enemies.

North Korean Missile and Nuclear History

It is almost impossible to separate the history of the North Korean missile program from its nuclear program, as the DPRK continually seeks the technology needed to attach one of a possible 20 nuclear warheads to a functional intercontinental ballistic missile (ICBM).[3] While previous DPRK leaders pursued missile and nuclear technology, current regime leader Kim Jong Un has accelerated the pace of research and development. The historical timeline shown, while not all-inclusive, provides some historical perspective to the DPRK's missile and nuclear testing programs. After each DPRK breach of international conventions—often due to an unannounced nuclear or missile test—the international community placed ever-stronger economic sanctions on the country. The gradually-constricting economic noose only spurred the DPRK to become more obstinate in its determination to pursue further testing.

More Recent History

Over the past two years, the DPRK has accelerated the pace of its nuclear and missile testing programs even more. Over that time span, North Korea has conducted several missile tests, including two nuclear tests in 2016—January and September. In response, the UN Security Council implemented even more severe sanctions against the unrepentant state. In their characteristic style, the North Koreans chose to conduct thirteen rounds of missile testing throughout the first seven months of 2016, firing an aggregate of over 30 missiles of various sizes and capabilities.

Table 2. 2016 North Korean nuclear and missile testing events

6 JAN	Fourth nuclear test: 4–6 kilotons
7 FEB	Satellite launch test; probable failure
21 MAR	Five SRBMs landed 200 km away in the Sea of Japan
15 APR	Musudan explodes at liftoff
23 APR	SLBM travels only 30 km in failed test
28 APR	Dual launch separated by 12 hours; both missiles failed to launch
31 MAY	Mobile Musudan explodes just after launch
21 JUN	Two Musudans fail shortly after launch
23 JUN	DPRK claims it has a missile that can travel 4,800 km; enough range to reach American islands in the Pacific
7 JUL	South Korea decides to place the American Terminal High Altitude Air Defense (THAAD) system in its country
9 JUL	SLBM test leaves submarine but fails shortly after launch
19 JUL	Three SRBMs travel 500–650 km before landing in the ocean
3 AUG	Two separate launches; one explodes on the pad and the other lands in Japanese territorial waters
31 AUG	DPRK initiates railroad launcher construction
5 SEP	Three ballistic missiles fly 1,000 km while Group of 20 meet
9 SEP	Fifth nuclear test: 10 kilotons

Missile Inventory

North Korea possesses an estimated 1,000 ballistic missiles that could possibly be used as transportation platforms for delivering nuclear or chemical weapons.[4] These missiles range from Scuds that could travel 300–800 km to the Nodong medium-range ballistic missile with a range of 1,000–1,600 km.[5] The DPRK is attempting to build missiles with the capability to reach the western US, but some analysts and even the North American Aerospace Defense Command (NORAD) commander believe that the country has already achieved that goal with the Unha space launch vehicle, which could be used in such a capacity despite its numerous drawbacks, or the KN-08 ICBM, claimed to be operational by the DPRK.[6] The Unha is not a typical nuclear launch vehicle because of its above-ground launch pad, its low reliability, and its limited ability to deploy an advanced reentry device, such as a nuclear weapon. Some analysts believe that the KN-08 is not operational and that those seen in parades are only mock-ups.[7]

Overall Missile Capabilities

The South Korean capital city of Seoul and most American military units are well within the range of North Korea's short-range ballistic missiles (SRBMs). Most of these missiles possess the capability to carry chemical and nuclear warheads. Japan, a historical enemy of North Korea, is well within the range of the DPRK's medium-range ballistic missiles (MRBMs), as are American military bases in the Pacific.[8] Most DPRK MRBMs can carry a chemical or nuclear warhead. Depending on the type, the intermediate-range ballistic missiles (IRBMs) or the shorter-range ICBMs can reach the Hawaiian Islands or the Alaskan coast.[9] The DPRK is working on the technology to place a nuclear warhead on its IRBMs and ICBMs. With the completion of the Taepodong-3 and the KN-08, the western coast of the US is now a potential target.[10] If North Korea successfully perfects its submarine-launched ballistic missiles (SLBMs), a North Korean submarine could approach the US coastline and use shorter-range missiles to hit the continental United States.[11]

Table 3. Normal ranges for missile types

SRBM	<1,000 km
MRBM	1,000–3,000 km
IRBM	3,000–5,500 km
ICBM	>5,500 km

Overall Missile Weaknesses

The North Korean missile program has several weaknesses, most notably accuracy.[12] The most accurate missile is the Hwasong-5, with a 450-meter circular error probability (CEP). A CEP is the radius of the circle in which 50% of the fired missiles will land, with smaller CEPs being more accurate.[13] Even though many of the DPRK's missiles have a high CEP (i.e. are not very accurate), any missiles cause a fear in the targeted general population. While the inaccurate missiles may not generate a tactical advantage for North Korea, they might create a strategic advantage as the missiles might create panic in the civilian populace.

Secondly, despite all the missile tests conducted by North Korea, several of its missiles still have yet to be fully tested.[14] Reentry has not been attempted by many of the Taepodong family of missiles. Some of these missiles have been used to place satellites into orbit, but could potentially be repurposed as ICBMs. In other words, the DPRK has produced many missiles not knowing whether they are reliable or not.[15] The number of missiles that have failed in the tests conducted over the last several years demonstrates, however, that DPRK scientists are still persisting in their search for the right technology to achieve success. After the North Korean scientists have worked out the bugs and found the right missile/warhead combination, having a nuclear ballistic missile would create a credible deterrent as well as a potential offensive threat against the country's adversaries.[16]

The final issue is that the missiles with the longest range are less mobile, and most likely to be fired from stationary launch pads.[17] These pads are probably already known to the American military and its allies, who are likely to have their coordinates pre-plotted on targeting boards. In case of war on the Korean peninsula or in the region, it is probable that these permanent launch pads would be destroyed early on by missiles, aircraft, unmanned aerial vehicles, or special operations personnel conducting direct-action missions.

Major North Korean Missiles

The following is a short discussion of each of the DPRK's major missile systems, with a chart at the end summarizing the basic capabilities of each missile.

Figure 1. KN-01 anti-ship cruise missile

KN-01 Short-Range Anti-Ship Cruise Missile

North Korea may use the KN-01 against other targets besides ships, and it has the capacity to carry chemical weapons. The KN-01 is mounted on armored vehicles and on some modified aircraft. Under development since the 1990s, the first test flight took place in 1994, with additional test-firings conducted through at least 2009. In May 2015, the DPRK test-fired three KN-01 missiles from Wonsan on the country's east coast. The missile's reach ranges from 200 km, with the latest versions reaching up to 300 km.[18]

KN-02 Toksa SRBM

The KN-02 is a North Korean copy of the Russian SS-21 Scarab missile, with a range of 120 km. This distance would allow the Toksa to hit targets south of Seoul from firing positions in North Korea. The North Koreans can increase the range of the Toksa to 160 km by reducing the warhead's weight to 250 kg. Regardless of payload size, the CEP remains approximately 100 m. The KN-02 can carry high explosives, sub-munitions, or chemical weapons. The Toksa's transporter erector launcher (TEL) is a modified 6 X 6 army truck, similar to the Russian MAZ 630308-243, with two rectangular roof panels capable of providing protection in a contaminated battlefield environment. The vehicle's top road speed is approximately 60 km/hr, and it operates with an estimated crew of three. Normally the KN-02's TEL travels with a reload vehicle that carries 2–4 additional missiles. The Korean Peoples' Army (KPA) began replacing its Free Rocket Over Ground (FROG)-7 missiles with the Toksa after initial testing began in April 2004. The initial flight test failed, but after three tests in each of the following three years, initial production began in 2008. Analysts at that time expected the KPA to have 150–250 of these missiles on hand by 2013. In 2009, the DPRK fired a salvo of five

Figure 2. Two KN-02 SRBMs

missiles during a test. Two of the missiles performed poorly and landed in the sea just after their launch, while a third never got off the ground. The remaining two missiles traveled 130–160 km. Speculation was that this salvo may have been a flight test for an improved version of the KN-02.[19]

Hwasong-5 SRBM (Scud-B)

The Hwasong-5 is a North Korean-built version of the Soviet Scud-B (SS-1C). The country reportedly received a small number of Soviet-built Scud-Bs in 1981. One North Korean defector said in his debriefing that the DPRK received 20 Scud-Bs in 1972 in exchange for the Soviets receiving access to the intelligence equipment present on the USS Pueblo, captured in 1968. Whatever the date that North Korea received Scuds from the Soviet Union, DPRK scientists reverse-engineered the missile and began building their own version. By 1983, the government felt confident enough to sign an agreement that not only sold Hwasong-5 missiles to Iran, but also established a production line for the Tehran government that eventually allowed the Iranians to produce their own version, the "Shahab-1." Actual flight testing for the Hwasong-5 did not occur until 1985, with mass production beginning the following year. There are reports that the Soviet Union sent 240 Scud-B missiles to North Korea in 1985, and that the DPRK "factory" simply assembled the missile components. By 1992, North Korea had built an estimated 300 Hwasong-5s and exported 120 of them to Iran, along with 18–20 TELs. The TEL is typically a North Korean version of the Russian MAZ 543 Scud-B vehicle, but commercial vehicles can also be used to transport the missile. The best estimate is that approximately 100–150 Hwasong-5s remain in North Korea. Other countries that possess the Hwasong-5 or have operated it in the past include Libya, Syria, the United Arab Emirates, and Yemen.[20]

Figure 3. Two Hwasong-5 SRBMs

The original Hwasong-5 closely resembled the Scud-B, but incorporated some modifications dating to 1985 with the airframe, guidance system, and motor. The range of the Hwasong-5 is estimated to be between 300 and 320 km; its minimum range of 50 km and accuracy of 450 m CEP puts Seoul and most of South Korea easily within the missile's reach. The Hwasong-5 can carry a number of high-explosives-bearing warheads of up to 1,000 kg; unitary chemical, biological, or chemical sub-munitions; and possibly even a nuclear weapon. A typical North Korean Hwasong-5 battery consists of four TELs and 12 other supporting vehicles. Each missile operates with a crew of about five personnel. Because the Hwasong-5 is easily transportable over the mountainous North Korean terrain, the Hwasong-5's TEL could be very difficult to detect before the missile is launched. It takes approximately one hour for the crew to prepare and complete the Hwasong-5's launch sequence.[21]

Hwasong-6 SRBM (Scud-C)

The Hwasong-6 is the North Korean variant of the Russian Scud-C; development began in 1984 and the missile is almost identical in appearance to the Hwasong-5. It went into production in 1992 after successful trial tests conducted during the previous year. While the Hwasong-6 is the same size as its Scud predecessor, it carries more fuel due to internal design changes and a lighter outer steel skin. The design changes increased the missile's range to 500 km while retaining its 50 km minimum range. Accuracy diminished, however, with the CEP expanded to 1,000 m. The Hwasong-6 can carry the same warhead types as the Hwasong-5, but the payload capacity took a 25% cut to 750–770 kg, a trade-off for the increased range. Reports indicate that North Korea has exported the Hwasong-6 to Cuba, Egypt, Iran, Iraq, Libya, Syria, Vietnam, and Yemen. There has been no actual confirmation on the receipt of Hwasong-6 missiles by Cuba, Egypt, or Iraq. The introduction by some countries—including Iran, Libya, and Syria—of their own indigenous production lines has made it more difficult to determine who among them now possess inventories of the Hwasong-6. In 2004, Libya sent five Hwasong-6 missiles and two MAZ 543 TELs to the US for examination.[22]

Hwasong-7 SRBM (Scud-D)

The Hwasong-7 is a North Korean version of the Russian Scud-D. Built slightly longer than its two predecessors to allow for more fuel and oxidant, the Hwasong-7 reportedly possesses a range of 700 km, but the minimum range has been extended to 150 km. While the range continues to grow thanks to technological advances, the payload continues to drop, with the Hwasong-7 now limited to only 500 kg. Accuracy continues to worsen as ranges increase, with CEP now reaching 3,000 m. Some reports indicate that a new optical correlation system installed on the Hwasong-7 has reduced the CEP to only 200 m. There are also reports that the Hwasong-7 possesses a Scud-ER (extended range) capability, based on a reduced 300 kg payload that increases the missile's range to 1,000 km. It is estimated that North Korea possesses approximately 600 of the Hwasong family of missiles.[23]

Figure 4. Two tarp-covered Hwasong-7 SRBMs

Taepodong-1 (TD-1) MRBM

The Taepodong-1 MRBM is a two-stage missile that can propel a 750 kg payload 2,200 km, or a 1,000 kg warhead 2,000 km. The TD-1 is also known by a variety of other names: the Scud Mod-E, Scud-X, Moksong 1, or Pekdosan 1. It can carry up to 1,000 kg of high explosives, probably concentrated VX (Venomous Agent X) chemical agent, and possibly a nuclear weapon. The latter capability is based on unconfirmed speculation by some analysts. The Taepodong-1 is so inaccurate that it is considered more of an area weapon that one aimed at a specific point target. Development of the missile began in 1987 and launch facilities are located at Chiha-ri, Sangnam-ri, Yongjo-ri, and Yongnim-kun bases. The DPRK fielded the TD-1 despite several setbacks in testing, including an explosion on 31 August 1998 during a flight test. Analysts believe its first stage is a Nodong missile, and the second stage is a variant of the Scud-B or Scud-C missile. The Taepodong-1's range places all of South Korea and Japan within reach of conventional munitions and possibly nuclear, biological, or chemical weapons. North Korea's use of decoys makes determining the exact number of TD-1s in its inventory difficult. A 2006 report estimated that the DPRK only possessed approximately 25–30 of these missiles for testing or actual use. A 2008 report ventured that most operational TD-1 missiles were probably in storage because advances in technology rendered them obsolete. Taepodong-1s used to launched North Korean satellites into space have a slightly longer range and, if modified, could be used as MRBMs to attack ground targets.[24]

Musudan IRBM

The Musudan is an IRBM with a minimum range of 640 km and a maximum range of 2,500–4,000 km, with the capacity to carry 1,200 kg of high explosives or a nuclear warhead. The CEP is estimated at 1,600 m, putting some US naval facilities within range of this missile. The Musudan has been called by a number of other names, including the Mirim, Nodong B, BM-25, and possibly the Iranian Shahab 4. The Musudan looks similar to a 1960s-era Soviet submarine missile called the SS-N-6 by Western militaries. Some analysts speculate that Iran bought the components for 18 Musudan missiles from North Korea in 2005. Musudan parts were intercepted in 2009 in transit from North Korea to Iran. The North Koreans first put the Musudan on display at an April 2007 military parade, and again in an October 2010 parade. Some analysts at the time also speculated that the missiles were not operational, but only mock-ups. In April 2013, activity at the Tonghae launch facility in northeastern part of the DPRK indicated that the Musudan may be in active service. Admiral Samuel Locklear, US Pacific Command Commander, told the Senate Armed Forces Committee that Musudan movement has been detected on the North Korean east coast. Reports indicate that there are at least 50 Musudan TEL vehicles and

Figure 5. Musudan IRBM

missiles at four different locations in North Korea. Missile technology experts have thoroughly examined photos of the Musudan since its appearance in several parades over the past few years. A number of these experts believe the Musudan incapable of matching the capabilities of the original Soviet version built in the 1960s, despite the advantages of newer Russian SS-N-6 technology.[25]

Taepodong-2 (TD-2) IRBM

The Taepodong-2 is a two-stage missile—some analysts say it consists of three stages—with a range of 3,750 km carrying a 750 kg payload or a 3,500 km range with a 1,000 kg warhead. Some analysts estimate the range to be between 4,000 and 8,000 km, if indeed there is a third stage on the missile. Once source even estimated its range to be 15,000 km. While the accuracy of the Taepodong-2 is unknown, analysts believe that it will not be a precise weapon. Like the Taepodong-1, this missile can carry up to 1,000 kg of conventional high explosives, chemical weapons such as concentrated VX agent, or a nuclear weapon (assuming DPRK possession of a nuclear capability). The TD-2 went through its first flight test in July 2006; of three known tests, two were unsuccessful. The DPRK has claimed that several of these tests involved an Unha-3 satellite launching vehicle, but most analysts disagree, believing that North Korea wants to either hide the fact it is testing an IRBM or to cover up a failed test of its weapons program.[26]

Figure 6. Taepodong-3 ICBM

Advanced Taepodong-2 ICBM (Taepodong-3)

While the North Koreans have never actually conducted a flight test, a 1999 report indicated that DPRK scientists were working on an improved missile in the Taepodong series. This missile would be longer than the Taepodong-2, with three or four stages. Most analysts estimate the range of this new missile to be between 10,000 and 12,000 km, which would put the entire United States within its reach.[27]

KN-08 ICBM

First displayed in April 2012, this missile has created a controversy over whether it is an actual missile system or just a mock-up to deceive observers outside the country. There are basically three possible reasons that explain why outsiders have seen no tests for this missile: (1) Iran ran the flight tests; (2) the North Koreans were confident that the missile would work because of Russian scientist involvement; or (3) the missiles are mere mock-ups meant to deceive people outside the country. Some analysts believe these missiles are the latter, but the TELs carrying the missiles in parades were designed specifically for the KN-08. The time, effort, and money used to build the TELs all suggest significant effort of the sort the DPRK would be unlikely to undertake if the missile were just a decoy. Admiral Bill Gortney, the US Northern Command and NORAD Commander, told reporters in April 2015 that the KN-08 was operational.[28]

The KN-08 missile's range is 5,000–6,000 km, placing Alaska and possibly the continental US within range. Estimated warhead weight is between 750–1,000 kg. It would likely be able to carry high explosives or chemical weapons, and the NORAD commander hinted that it could potentially carry a nuclear weapon. It is likely that the KN-08 will not reach initial operational status until 2020 due to the lack of test flights. The senior commander in South Korea, General Curtis Scaparrotti, downplayed the possibility of a nuclear-armed KN-08 because North Korea had yet to test such a weapon and the odds of it being effective are very low.[29]

Figure 7. KN-08 ICBM

Table 4. North Korean missile arsenal[30]					
Missile	**Range (km)**	**Launcher Type**	**Payload Capacity (kg)**	**Accuracy (km)**	**On Hand (Est)**
KN-01 short-range anti-ship cruise missile (Russian Styx)	160	Mobile	454	INA	INA
KN-02 Toksa SRBM (Russian Scarab)	100–120	Mobile	INA	High	50 (100 by 2020)
Hwasong-5 SRBM (SCUD-A/B)	320 (300–340)	Mobile	985–1,000	0.45	100–150
Hwasong-6 SRBM (SCUD-C)	500-600	Mobile	700–770	1	300
Hwasong-7 MRBM (Nodong-A, SCUD-D, Nodong-1, or Rodong)	700–1,600	Mobile	500	3	200
SCUD ER SRBM	800–1,000	Mobile	300	Extremely Poor	400–450
Taepodong-1 MRBM (Unha-1)	2,200 (2,000–2,500)	Pad	750 (700–1,000)	3+	25–30
Musudan IRBM (Taepodong-X or Nodong-B)	3,200 (2,500–4,000)	Mobile	1,200	1.6	12–200
Taepodong-1 Satellite Launch Vehicle IRBM	4,000	Pad	50–100	INA	INA
Taepodong-2 ICBM (TD-2 or Unha-2)	6,600 (4,000–8,000)	Pad	700–1,500	10+	INA
Advanced Taepodong-2 ICBM (Taepodong-3/Unha-3)	10,000 (8,000–15,000)	Pad	500–1,000	INA	INA
KN-08 ICBM	5,000–6,000 (8,000?)	Pad	750–1,000	INA	INA

Summary and Outlook

North Korea possesses a large inventory of missiles that could carry chemical or nuclear warheads. The latter is still in doubt, depending on whether DPRK scientists can successfully mount the nuclear warheads to an operative missile delivery system. South Korea, Japan, the Hawaiian Islands, and Alaska are all well within range of North Korean missiles. If the longest-range missiles are actually functional, then the western United States is also within range. If the DPRK can successfully launch SLBMs from its submarines, then North Korea could threaten the US without possessing actual ICBMs. This means that US forces stationed in South Korea, Japan, Hawaii, Alaska, or even the continental US must be prepared for North Korean missiles of all types and ranges.

In the short term, DPRK scientists will continue testing to increase both the range and accuracy of their ground-based missiles. North Korea will continue to focus on SLBMs, as Kim Jong Un has stressed the importance of placing nuclear warheads on missiles for the anticipated war with the US or another perceived enemy country.[31] The DPRK will continue to conduct nuclear tests in defiance of the international community, as a successful coupling of a nuclear weapon to any type of ballistic missile would enhance the stature and prestige of this rogue country in the international community and most likely help deter any military action against North Korea by the same.

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US Army Training Circular (TC) 7-100.2, *Opposing Force Tactics*, will be updated in 2017 and electronically distributed by winter 2017. This training circular, as part of the TC 7-100 series, describes an opposing force (OPFOR) that exists for the purpose of training, professional education, and leader development for Army readiness.

The OPFOR reflects a composite model of characteristics and capabilities of traditional militaries, irregular forces, criminal organizations, and other adversaries or threats that may be present in operational environments (OEs) in which US forces might be committed to in the near- and mid-term years. The nature of actors and OEs is constantly changing, and the US Army must remain prepared for real-world developments and contingencies. As with actual threats or enemies, the OPFOR will continue to present new and diverse challenges for US forces in learning environments. However, when a unit is alerted for a known deployment area of operation, the OPFOR will portray the threats or enemies of that mission area during final readiness exercise validations.

Army Regulation 350-2 identifies the Training and Doctrine Command (TRADOC) G-2 as the responsible official for the operational environment and opposing force programs across the Army. Within TRADOC G-2, the Analysis and Control Element Threats Integration (ACE-TI) serves as the Army lead for designing, documenting, and integrating threats, OPFOR, and OE conditions in support of all US Army training, education, and leader development programs.

Threat
Any combination of actors, entities, or forces that have the capability and intent to harm United States forces, United States national interests, or the homeland.
ADRP 3-0, *Unified Land Operations* (2012)

Hybrid Threat
The diverse and dynamic combination of regular forces, irregular forces, terrorist forces, and/or criminal elements unified to achieve mutually benefitting effects.
ADRP 3-0, *Unified Land Operations* (2012)

A comprehensive study of traditional military forces, irregular forces, criminal organizations, and actions such as terrorism produced the TC 7-100 series on hybrid threats and variables of an operational environment. Requirements from the US Army assist in focusing a credible composite OPFOR representation of actual worldwide forces and capabilities in doctrine, tactics, techniques, organization, equipment, and systems. Representation of an OPFOR attempts to replicate threats as close as possible to actual tactical conditions and functional capabilities or limitations within available Army resources.

Update of TC 7-100.2

The update of TC 7-100.2 in 2017 will use threat models, rather than templates, to describe and illustrate tactical actions. A general concept for the update of TC 7-100.2 includes but is not limited to—

- Introduction of one strategic environment (SE) and many OEs that exist within the SE
- Opposing forces per Army Regulation 350-2
- Combined arms operations and hybrid threat
- Offensive actions
- Defensive actions
- Special topics in persistent conflict
- OPFOR tactical tasks and drills with threat model vignettes

An appendix of TC 7-100.2 will address the TRADOC G-2 update of OPFOR tactical tasks, conditions, standards, and accompanying evaluation performance measures. This project is being accomplished by ACE-TI in conjunction with the TRADOC G-2 Virtual OPFOR Academy (VOA) team. Another appendix will provide a user guide on how to access and apply the resources available on the VOA portion of the OE Training Support Center website. Resources include OPFOR task and drill training packages, an instructional video for each tactical task and drill, and a visualization video of how an OPFOR executes the task or drill at the company or subordinate-unit echelon.

The Functions of Tactics

The OPFOR fights as a norm in a very practical manner. OPFOR doctrine demonstrates a keen understanding and conduct of basic action fundamentals—*functional* tactics. Function is an action, series, or group of actions that cause an effect or effects with the expectation of a predictable outcome.

Functional Tactics
The integrated employment of forces and elements by purpose to achieve mission success.

Functional tactics is the idea that threat tactical action is best understood, described, and illustrated by the functions each actor or sub-element performs in order to bring about mission accomplishment. The concept of functional tactics remains constant regardless of the echelon executing a mission.

A core principle is to clearly understand the threat objective. Then, organizing by functional requirement and capability, the threat synchronizes the functional execution—the primary action and enabling actions—of combat power capabilities at a specific place and time in order to achieve its mission. Whether conducting a small dismounted unit raid on an observation post or attacking across a broad front with large mechanized and supporting aviation formations, function is the underpinning of understanding and effectively applying tactics with effective techniques in a particular OE.

Action and Enabling Functions

An OPFOR commander specifies the initial organization or task organization of forces or elements within the level of command. At brigade or brigade tactical group and higher echelons in task organization, threat OPFOR units and organizations performing tactical functions are referred to as *forces*, while at battalion or battalion detachment echelons and below, the units and organizations are called *elements*.

One part of the unit or organization conducting a particular offensive or defensive action is normally responsible for performing the primary function or task that accomplishes the overall mission goal or objective of that action. That part can be called the *action force* or *action element*. In most cases, the higher unit commander identifies the action force/element with a more specific designation of its assigned mission or task. For example, if the objective of the action at detachment level is to conduct a raid, the element designated to complete that primary action may be called the *raiding element*.

In relation to an action force or element, all other parts of a unit or organization provide *enabling* functions to support the success of that force/element. Each of these units or organizations can be called an *enabling force* or *enabling element*. A specific functional title is assigned based on the function or task to be performed. For example, a brigade-size force that enables by *fixing* enemy forces so they cannot interfere with the primary action is a *fixing force*.

Functional Analysis

Functional analysis is an intelligence analysis methodology that uses the concepts of functional tactics to predict threat courses of action. The functional actions of tactics can be predicted with analysis of certain activities that must be performed in order to accomplish a designated task or drill. This requires more than a one-dimensional template that arrays a friendly force or element without appreciating OE variables, tactical conditions, and adversary or enemy actions and disposition in a particular OE. Functional analysis visualizes possible or probable threat actions based on how it will probably use known or suspected capabilities in a comprehensive approach to tactical engagement or battle. The resulting threat model is a graphic depiction of a tactical action and enablers, accompanied by a concise tactical description of how

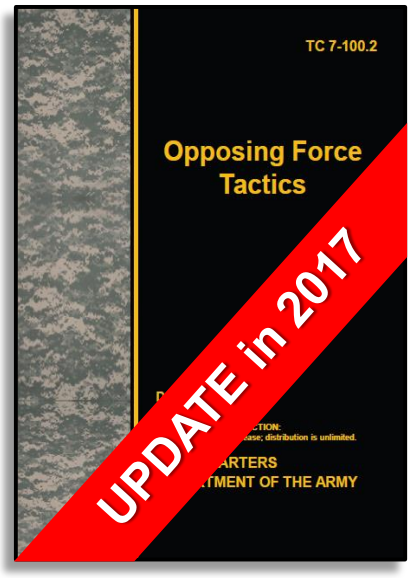
a threat might or is likely to conduct its operations in terms of capabilities, task organization, dispositions, and sequential, successive, or parallel actions in order to accomplish its particular mission.

Implications for US Army Readiness

Readiness standards are evaluated by a unit commander with a unit's mission essential task list or specified tasks for known or contingency missions. The conditions for Army training events must include a complex operational environment that is realistic, relevant, and challenging to the training unit, leaders, and soldiers.

The US Army TC 7-100 series describes OPFOR in conditions that exist for training US Army forces to clearly appreciate threats in order to achieve sustained readiness. ACE-TI continues to collaborate with the US Army Intelligence Center of Excellence on an update to Army Training Publication 2-01.3, *Intelligence Preparation of the Battlefield/Battlespace.* Ongoing coordination in 2017 will expand the use threat models to effectively present understanding of a threat and possible or probable courses of action. Threat models avoid the misuse of basic unit templates that present bland and often misleading set-piece geometric dispositions of forces with no reference to other actors and terrain in a peculiar OE. Such a basic template image is typically too abstract and lacks the ability to visualize what is occurring in an OE and tactical situation. A threat model improves understanding of how a specific threat can apply its capabilities to achieve its goals and objectives.

TC 7-100.2, *Opposing Force Tactics*, reflects a composite of the characteristics of traditional and irregular threats, and other conditions that may be present in OEs in which US forces might become involved in the near- and mid-term. As the overall nature of an OE is constantly changing, so are key requirements in US Army training for flexible and adaptive situational awareness and understanding of adversaries and enemies.



Other training literature in the TC 7-100 series to complement the TC 7-100.2 update includes but is not limited to the following documents.

- TC 7-100.3, *Irregular Opposing Forces*, addresses irregular opposing forces as individual and composite threats in three primary categories: insurgents, guerrillas, and criminals. Other actors may be independent, affiliated, or associated with OPFOR in an OE or part of a hybrid threat.
- TC 7-100.4, *Hybrid Threat Force Structure Organization Guide*, provides traditional and irregular force organization guides, and is linked to online organizational directories that a commander can tailor or task-organize.
- TC 7-100, *Hybrid Threat*, addresses adaptive threats and activities that are present in complex OEs. As the hybrid threat continues to evolve, a description for consideration is an affiliation of actors employing a combination of traditional, irregular, catastrophic, or disruptive capabilities to achieve a mutually beneficial effect.

ACE-TI encourages readers to submit their ideas and unclassified data on traditional or irregular threats, state and non-state actors and proxies, to consider for the 2017 update of TC 7-100.2, *Opposing Force Tactics.* For sustained US Army readiness in training, professional education, and leader development, the OPFOR and hybrid threats must be realistic, robust, and relevant to current and future mission sets in complex OEs. Send comments for TC 7-100.2 to Jon H. Moilanen at jon.h.moilanen.civ@mail.mil. ACE-TI will provide periodic updates on TC 7-100.2 progress and a formalized review process of a coordinating draft in future issues of the TRADOC G-2 *Red Diamond* newsletter.

What ACE Threats Integration Supports for YOUR Readiness

- Determine Operational Environment (OE) conditions for Army training, education, and leader development.
- Design, document, and integrate hybrid threat opposing forces (OPFOR) doctrine for near-term/midterm OEs.
- Develop and update threat methods, tactics, and techniques in HQDA Training Circular (TC) 7-100 series.
- Design and update Army exercise design methods-learning model in TC 7-101/7-102.
- Develop and update the US Army *Decisive Action Training Environment (DATE)*.
- Develop and update the US Army *Regionally Aligned Forces Training Environment (RAFTE)* products.
- Conduct Threat Tactics Course resident at Fort Leavenworth, KS.
- Conduct Threat Tactics mobile training team (MTT) at units and activities.
- Support terrorism-antiterrorism awareness in threat models and OEs.
- Research, author, and publish OE and threat related classified/unclassified documents for Army operational and institutional domains.
- Support Combat Training Centers (CTCs) and Home Station Training (HST) and OE Master Plan reviews and updates.
- Support TRADOC G-2 threat and OE accreditation program for Army Centers of Excellence (CoEs), schools, and collective training at sites for Army/USAR/ARNG.
- Respond to requests for information (RFIs) on threat and OE issues.

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