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Warfare Branch

Insights to 'Training Smarter' Against a Hybrid Adversary



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Acknowledgements

This Handbook is the result of extensive research of the current conflict in Ukraine (UKR). It could not have been written without reference to Warfare Branch’s recent Hybrid Warfare Relative Capabilities Review. The handbook also builds on the excellent work of our American partners in the Training and Doctrine Command (TRADOC) and Asymmetric Warfare Group (AWG). Such pieces of work always relies upon a network of academics such as Dr Karber and the Potomac Foundation as well as anecdotal evidence from Post Operational Reports and Interviews in order to bring this to life. We are indebted to each of them for their assistance.

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Introduction

The British Army has been in conflict in Afghanistan and Iraq for more than a decade and the military has made significant adaptations to its force to address these types of adversaries (nonstate / irregular forces). While this experience has honed our ability to fight nonstate / irregular adversaries, these may not be the skill sets required to fight in the future. Potential adversaries know our capabilities and vulnerabilities; we must be ready to fight a full range of adversaries.

While we focused on Op ENTIRETY, superpowers such as Russia (RUS) and China (CHN) continued to develop military capabilities designed to overmatch NATO capabilities. While we may never fight RUS or CHN directly, we must be prepared to fight their military capabilities in future 'state sponsored' conflict (such as currently seen in UKR, Syria¹ and Iraq).

The current UKR Anti-Terrorist Operation (ATO) in the Donbass reflects the closest interaction between a state (RUS) and its proxy (Pro Russian Separatists (PRS)) and the use of high-end weaponry not seen since the Cold War² against the Ukrainian

Armed Forces (UAF). The current UKR conflict also calls into question RUS's intentions in the Baltic States, which are now NATO members. In the unlikely event of a direct confrontation between NATO and RUS, we must acknowledge that RUS currently has a significant capability edge over UK force elements.

Due to the fact that some of our high-end military capabilities have been eroded in since 2003, we must find ways to 'fight smarter' at the tactical level, acknowledging that some adversaries may be armed with weapons that are superior to our own.³

Aim

During this time of financial constraint, this article aims, by drawing on our capability gaps in regard to current RUS capability seen in UKR, to recognise our shortfalls and provide insights to mitigate them at the tactical land level by 'training smarter'.

Structure

The article draws directly from UAF ATO experiences and gives training recommendations which units could adopt to best mitigate the current RUS capability advantage in the '*fight tonight*'.

1 RUS is using its military to help keep Bashar al-Assad in power. However NATO have yet not supplied the Syrian rebels with MANPADs to deal with Syrian / RUS airpower due to concerns of escalation and high-end weaponry falling into extremist hands. Islamic State has captured significant military capabilities (M1 MBT, MANPADs (AT-14), ATGM and ZU-23-2), mainly captured from the Syrian and Iraq Army.

2 RUS is generally not supplying the UKR separatists with its top-tier weapons, although the RUS have employed these high-end systems themselves when necessary to stave off UKR success. Similarly, the US has refused to provide UKR with ATGW (Javelin), capable of defeating RUS tanks.

3 As an example the RUS BM-30 SMERCH MLRS outranges our MLRS.

The Range of Adversaries NATO May Face Across the Spectrum of Operations

- Mujahideen (Afghanistan 1979)
- Palestine Liberation Organization West Bank (2001)
- Al-Qaeda in Iraq (2007)
- Taliban Afghanistan (2009)
- Mujahideen Afghanistan (1988)
- Chechnya (1990)
- Hezbollah Lebanon (2006)
- Hamas Gaza (2008)
- Islamic State (now)
- Ukrainian separatists (now)
- Soviet Union (in Afghanistan 1970s-1980s)
- Russia (Chechnya 1990s)
- Israel (Lebanon 2006)
- Georgia (2008)
- Russia (Georgia 2008)
- Israel (Gaza 2008)
- United States (Afghanistan and Iraq 2010)

State

State-sponsored hybrid

- **Organization:** Moderately trained, disciplined, moderate-sized formations (up to battalion)
- **Weapons:** Same as irregular but with standoff capabilities (ATGMs, MANPADs, longer-range rockets)
- **Command and Control:** Multiple means, decentralized

Nonstate Irregular

- **Organization:** Not well trained, little formal discipline, cellular structure, small formations (squads)
- **Weapons:** Small arms, RPGs, mortars, short-range rockets, IEDs/ mines
- **Command and Control:** Cell phones, runners, decentralized

- **Organization:** Hierarchical, brigade or larger-sized formations
- **Weapons:** Sophisticated air defences, ballistic missiles, conventional ground forces, special operations forces, air forces, navies, some with nuclear weapons
- **Command and Control:** All means, generally centralized

Characteristics

- **Nonstate / irregular forces** - typically are not well trained, have little formal discipline, and typically operate in small formations about the size of our sections. Their weapons are small arms, rocket propelled grenades (RPGs), mortars, short-range rockets, and improvised explosive devices (IEDs) or mines. They operate under decentralised C2 through mobile phones or runners.
- **Middle adversaries** - are essentially state-sponsored hybrid forces characterized by capabilities on both ends of the spectrum. Thus, they have the same sorts of weapons that irregular forces have but have additional capabilities, such as anti-tank guided missiles (ATGMs) and man-portable Air Defence (AD) weapons (MANPADs) and longer range, larger calibre rockets. They employ multiple means of C2 but generally operate in a decentralised fashion.
- **High-end adversaries** - are the forces of a nation state. They are hierarchically organized forces, ranging from bn to bde and larger formations. Their weapons span the spectrum of sophisticated weaponry including; ADs, ballistic missiles, conventional ground and special operations forces, air and naval forces and in some

cases nuclear weapons. C2 is exercised through all means and are generally centralised. They also have long-range fires; sophisticated anti-access and area-denial capabilities and intelligence, surveillance, and reconnaissance capabilities.

Challenges to the Land Component

- Partly because of the recent and current focus on irregular operations in Iraq and Afghanistan, we are arguably unprepared to deal with state-sponsored hybrid and state operations that fall at the other end towards Major Combat Operations in the *'Mosaic of Conflict'*.
- Our potential opponents are competent, experienced adversaries, especially in the middle and high ends of the spectrum of operations.
- Such opponents employ weapons that can defeat our combat vehicles and put our force elements (FEs) at risk, and these opponents are continuing to developing more sophisticated weaponry.
- As demonstrated in UKR, we might face an adversary who employs the full range of adversary capabilities simultaneously - as expressed in RUS's *'New Generation Warfare'*.





Russian Goals in Ukraine

Political

- Prevention of UKR joining EU and NATO.
- The restoration of pro-RUS authority in the UKR.
- Demonstration of RUS ability to achieve its goal by all available means.
- Testing NATO resolve in the current political and economic environment.

Economic

- Exhaustion of UKR economy.
- Instituting RUS control over UKR enterprises.
- Damaging UKR energy sector by cutting off Donbass coal reserves.

Military

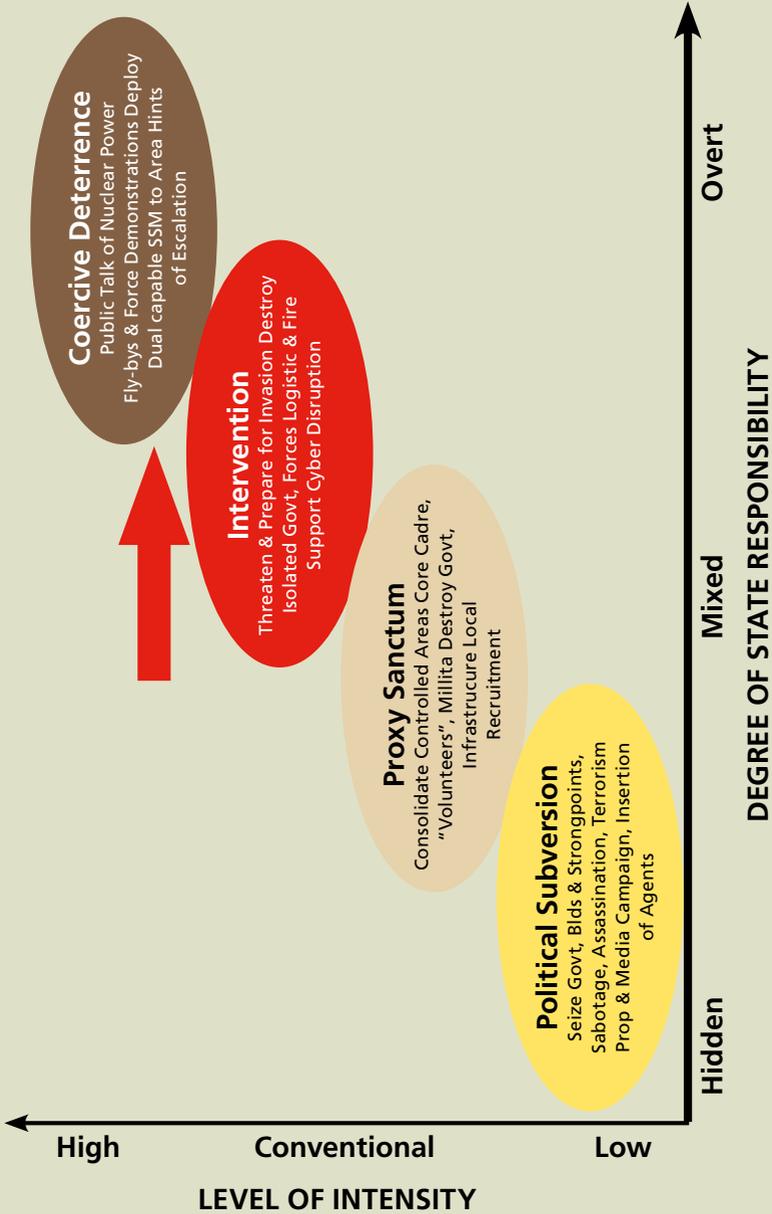
- Defeat of the UAF.
- Occupation of Donetsk and Luhansk regions.
- Ensuring RUS permanent military presence in the UKR.
- Practicing new methods of warfare as well as testing modern and prohibited weapons.

PRS/RUS Enemy Attack Indicators

- Attacks usually came immediately before dawn, and would be initiated with Artillery.
- Enemy forces would conduct PSYOPS tactics the night before an attack. They would move vehicles around numerous times, to conceal the true number of vehicles moving into or out of attack position.
- Enemy infantry elements move around the battlefield via SUVs, cars, by foot, and any other means available.
- Radio jamming of all radio frequencies occurs prior to attack, with PRS/RUS sending SMS IO texts to the defenders Personal Equipment Devices (PEDs).



Russian Style Hybrid Warfare in Ukraine



General Observations from ATO

- 1. Adaptation is rapidly occurring on the battlefield.** The speed of adaptation and innovation of equipment on the battlefield is rapid and hard to predict.
- 2. Armour fight in ATO has caused both sides to use increased protection measures.** UAF are installing double layers of reactive armour on their tactical vehicles in an attempt to counter the RUS artillery threat which can be catastrophic.
- 3. Use of non-standard communications.** The use of Wi-Fi, mobile phones, individual device applications (android/apple) have proven extremely useful for the PRS/ RUS. In many cases these forms of communication have been used to call for artillery strikes and direct troop movements on the battlefield. These systems are readily available through the ATO and easy for the enemy to use to its advantage.
- 4. Logistics.** The UAF have a poor logistical system, and have learned to operate on very little and still survive. Units must have the ability to “live off the land”, go with only bare essentials, and still remain combat effective.
- 5. OS.** RUS Army provides cross border MLRS artillery in support of PRS.⁴ Deep fires artillery is used extensively to support ground manoeuvre, presumably as a result of a reluctance to deploy artillery in close support in UKR. RUS Deep fires have also been effectively used in rapid counter battery fires, which have disrupted the UAF’s ability to call in fire missions, due to the requirement to constantly relocate artillery.

⁴ RUS has been reported to have fielded limited thermo-baric munitions; BM-30 SMERCH MLRS has a 90 km range.



6. Massed & Layered UAV. RUS Army can achieve persistent wide area surveillance across the Donbass regions by using up to 14 different UAV platforms in 5 layers of airborne coverage. A suite of platforms were provided to the PRS from RUS which are used cue mass artillery fires.⁵

7. Electronic Warfare (EW). RUS is winning the 'Electronic War'. RUS are using high-tech equipment to jam drones and block battlefield communications.⁶ EW is a real game changer as it significantly affects all our tactical systems that drive or fly. RUS technological advantage will help level the playing field when fighting against a superior conventional foe and NATO is scrambling to catch up.

8. Air Defence (AD). RUS has supplied SA-7, SA-18 and SA-22⁷ to the PRS. A RUS Battalion Tactical Group (BTG) has an organic AD PI which is tasked to destroy an enemy's AD capabilities to achieve local air superiority. When supported by medium to long range ADs such as the SA-6 system⁸ this provides a credible mobile layered AD system over key terrain.

5 Evidence suggests a response time of 15 min from when a target is acquired by UAV to an arty strike.

6 It is likely not aimed at UKR as much as it is aimed at NATO.

7 A vehicle mounted short to medium range AD system

8 SA-6 BUK is an Anti-Aircraft missile system with an acquisition range of up to 42 km and a reported operating altitude of 25 km. An SA-6 is believed to have been used to destroy Malaysian Airline MH17 on 7 Jul 14 when flying over eastern UKR.

9. Hybrid Techniques. When RUS SF "little green men", without their insignia but with their latest military kit, seized Crimea at the end of Feb 14, it could have easily been construed as the start of a new era of 'guerrilla geo-politics' and 'plausible deniability' which leverages misdirection, bluff, intelligence operations, criminal behavior and targeted violence to obtain political objectives, ie "using all the tools in the toolkit". The Crimea annexation began as a covert military operation, combining ambiguity, disinformation, and the element of surprise at the operational level with support from traditional weapons such as EW.⁹ The annexation was completed by a traditional military invasion and occupation, utilising RUS's airborne, naval infantry, and motor rifle brigades. In the Donbas region, RUS continues to deny that it is directly involved in armed hostilities, nevertheless it provides PRS with heavy munitions and logistical support. There is strong international evidence that RUS units are in fact fighting the UAF. Arguably, RUS's employment of diplomatic, economic, military, and information instruments in a state which they perceives as a 'vital' national interests is perhaps similar to what NATO countries have done for over a decade?

9 RUS stimulated local pro-Russian demonstrations, inserted unmarked militia groups ('little green men') to occupy official Government buildings, and oversaw a local referendum to lend an air of legitimacy to the annexation effort.

UAF Lessons Learned

- 1. Fighting Positions.** UAF built fighting positions based on old standards. Today's soldier carries new equipment that when donned does not allow the soldiers significant room to manoeuvre in the trenches. The dimensions of the trenches had to be increased to accommodate new soldier equipment.
- 2. Tactical Communications.** Harris radios are the only type of radio that is usable in the ATO due to RUS jamming operations. These radios are only issued at the Bde and Bn level. The Coys are left with older RUS Radios that are susceptible to jamming and are not usable on the front lines. The only guaranteed form of secure communications to contact higher HQs at the Coy level is through landline and field telephone.
- 3. Signal Intercepts.** PRS are using Motorola radios that are on a civilian band and are unencrypted. UAF have experienced success in using commercial scanners to intercept these communications. Additionally, the UAF have been able to induce confusion by transmitting false orders and spot reports on these civilian frequency bands to the PRS. In one specific instance, a PRS commander called a UAF commander (via mobile phone) and requested a cease fire. This conversation was captured, recorded, and then broadcasted by the UAF in an attempt to lower the morale of the PRS.
- 4. Use of Existing Surveillance Systems.** During the battle for control of the airport at Donetsk the UAF were able to tap into the already existing surveillance system at the airport to monitor the advance of PRS/RUS on the airport.
- 5. Use of "Twin Websites".** UKR has developed "twin websites" which mirror (in look and web address) the anti-UKR propaganda websites established and managed by RUS. This has proven effective in countering RUS propaganda messages with the local populace across the ATO.
- 6. Vehicular Protection from Artillery.** UAF vehicles are highly susceptible to RUS artillery strikes. In the opening stage of combat operations in the ATO, UAF sustained large losses to personnel caused by enemy artillery strikes on vehicles. The strikes would penetrate the vehicles and kill the soldiers inside. UAF have changed their tactics so that their soldiers now ride on the outside of their vehicles. This affords the UAF greater survivability during artillery attacks as their troops are able to dismount, disperse and move to cover rapidly.
- 7. Medical Support Capabilities.** The UAF have insufficient capability to conduct medical planning and medical support. Their medics are mostly female soldiers and are not allowed to go to the front lines of the ATO. Their doctors are the only medical professionals that can go to the front line. This leaves each unit severely incapable of providing medical support. Because of the lack of air MEDEVAC and medical support, the average time to move an injured soldier from the point of injury to a higher level care is greater than 72hrs. Unfortunately, by this time, many of the injured soldiers have succumbed to their wounds.

8. Defectors. During the initial stages of combat operations in the ATO, the UAF faced defections from their ranks to RUS.¹⁰ It is believed that this was caused by the over use of regionally formed units.¹¹ UAF are in the process of changing their manning processes to ensure that there is a mix of assigned personnel from across UKR instead of personnel from just one geographic region.

9. Lack of Current Optics. Due to the superior optics on RUS mechanised vehicles, RUS are able to identify and engage UKR forces early. In reaction to this, the UAF have established "dug in" defences from which they fight. They have used mines to fortify their positions. They have employed these defensive belts in a dispersed fashion because of the RUS artillery threat.

10. Chinese Lanterns to Identify Enemy Positions. Due to a lack of night vision devices, UAF have used "lighted lanterns" to identify enemy positions. When the winds are favourable, the lanterns are lit and the wind then pushes the lantern across PRS lines. The PRS has observed the lanterns and mis-identified them as UKR UAVs and subsequently, engages them with small arms. UAF are then able to conduct artillery strikes on enemy positions that have been un-masked.

11. Placement of Artillery on the Battlefield. Due to the long range artillery capability of RUS, the UAF keep their artillery systems 15-20Km behind the front lines. When fire missions are requested and approved, the artillery units move forward and fire, then push back outside of the range of RUS artillery.

¹⁰ This included entire units and unit commanders.

¹¹ It was mainly 'Crimean' units which were loyal to RUS and defected.



12. Usage of Snipers in the ATO. UAF snipers have had great success in the ATO during enemy attacks. The psychological effects on the enemy caused by sniper actions have had great effect and have allowed outnumbered UAF forces to win battles.

13. Pre-Programmed UAV Flight Routes. In response to RUS capability to intercept and take control of UKR UAVs control signals, the UAF began to pre-program their UAVs with flight routes. Once the flight route was programmed, it would fly its mission and return where the UKR operator could then download the data for analysis.

14. Artillery Planning. Software was developed by a private UKR company to assist the UAF in planning artillery strikes. The software is uploaded to any Android device and allows UKR Artillery commanders the ability to quickly plan artillery fires. It can be used as a stand-

alone device for planning methods or it can also connect via Wi-Fi and/or Bluetooth to UAVs for active targeting. A fire mission is then executed on the observed targets. Devices can also connect to provide a common operating picture for commanders in the field.

15. Counter UAV Techniques. When an enemy UAV is observed, UAF will mass concentrated Small Arms Fire (SAF). The results have been marginal.

16. UAF Snipers Use of Silencers. RUS acoustic devices were employed across the ATO which were capable of acquiring and locating precision locations of UAF snipers, which would launch enemy artillery strikes. To counter this, the UAF began using silencers on their sniper rifles.



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Tactical Training Recommendations by Tactical Function

COMMAND

1. **ATO experience.** RUS formation HQs have not been sighted in the UKR, remaining in RUS where they cannot be identified or interdicted. Those C2 nodes that do deploy forward are tactical, mobile HQs and used to integrate ISTAR, EW and precision munitions for FIND and STRIKE ops. RUS Army and PRS are reliant on a few professionally trained leaders of otherwise conscript forces. C2 is executed over tactical net radio, mobile and fixed telephony communications from field HQs predominantly within RUS.
2. **ATO experience.** UAF commanders use the Instant Messaging (IM) application 'Viber' to pass orders. The UAF are largely oblivious to the lack of security.

Comment. All UK HQs require to be mobile to survive within a contested forward area. HQs must expect to operate in proximity to enemy direct and/or indirect fires.

Tactical Training Recommendations

- The movement and CoC between Main, Step Up and Tac HQs¹² should be practiced to ensure better C2 resilience.
- Current HQ tentage provides no survivability against OS, Staff should practice, where possible, to operate within a protected / armour mobility platform.

- Staff training should focus on improving electronic ways of working, improve brevity and enhance IM/IX procedures. Transmission of large volumes of data should be avoided. OSW should only contain the information necessary for the subordinate and avoid unnecessary background information from the higher formation orders.
- HQs should rehearse reversionary modes, practicing the production and promulgation of OSW/traces with minimised transmissions.
- Security implications associated with modern technology should be continually re-enforced.

UNDERSTAND

3. **ATO experience.** UAF are under constant observation from commercially available and RUS military UAVs, this includes night operations. RUS UAVs will fly in pairs, one high one low. The lower UAV draws fire, and the higher UAV then observes to facilitate indirect fire. RUS UAVs can also broadcast their location upon malfunction/brought-down by the UAF, this also facilitates indirect fire.
4. **ATO experience.** UKR has no capability to counter PRS/RUS UAVs. Enemy UAVs have complete FoM in the ATO and are capable of conducting reconnaissance, signals interception, and jamming day and night. Once the RUS UAVs locate UKR units, they launch precision artillery strikes within minutes. There is little time to react after an enemy UAV is observed.

12 May also include Fwd, Alt or Adv.

5. **ATO experience.** UKR UAVs are susceptible to enemy jamming and hijacking. One enemy TTP is to hack into UKR UAVs feed to broadcast location data upon landing/retrieval. This facilitates an indirect fire attack upon the UKR forces recovering their UAV. Another enemy TTP, is to hijack the UAF UAV to divert away from the target area and instead return home.

Comment. *RUS achieves persistent wide area surveillance across the Donbas regions by using up to 14 different UAS platforms in 5 layers of airborne coverage. A suite of platforms were provided to the PRS which are used to cue mass artillery fires (including cross border fires from RUS). Anecdotal evidence suggests an average response time of 15 minutes from when a target is acquired by UAV to when artillery can be expected on a position. The Field Army currently has no AD capability that can counter low flying UAV.*

Training Recommendation

- Training should focus on this UAV threat and an enemy that has the ability to IDENTIFY and target fixed locations and forces with speed.
- OPFOR could be equipped with commercial/off the shelf UAV to raise awareness of the threat during training to enable units to practice low level AD. This includes the deployment of air sentries preferably equipped with or linked to anti-UAV weapon systems.¹³
- Units should practice effective TTPs to FIND, NEUTRALISE, DEFEAT and DESTROY UAV, this should occur in parallel with EW efforts.
- Units must practice the use of both thermal and visual camouflage coverings.
- Training should always emphasise the requirement to remain mobile.¹⁴

13 There has been some reporting of pintle mounted 12.7 mm MG being used successfully by UAF in an anti-UAV role.

14 Raids and 'shoot and scoot' tactics should be practiced.



- 6. ATO experience.** RUS forces have placed electronic interception devices in civilian vehicles across the battle space. These devices are capable of intercepting UKR communications as units move through the battle space.

Training Recommendation

- Units should practice counter surveillance (CSurv) and emissions control (EMCON) during training. This should include minimising transmissions when necessary, sitting of antenna, camouflage and concealment and the frequent use of dummy positions and field defences to minimise the prospect of being acquired and targeted.

INFORMATION ACTIVITY

- 7. ATO experience.** UAF was severely hampered by poor operational security (OPSEC), largely a result of significant levels of corruption in the higher echelons of command. Corruption has decreased however personnel security (PERSEC) remains a key concern.
- 8. ATO experience.** UAF soldiers are regularly contacted by former friends (now PRS) on social media.
- 9. ATO experience.** PRS/RUS used civilian radio stations to broadcast UKR troop movements and unit positions in the ATO. UKR had to suppress the radio station.
- 10. ATO experience.** RUS has displayed great prowess in the use of IO and PSYOPS throughout the ATO. This is accomplished through many means: Social Media, Propaganda Websites, SMS messaging, and civilian radio stations (to name a few). Of note, RUS have the capability to send out mass SMS text messages to every mobile phone in a geographic area via a UAV platform. This messaging could sway the

local populace towards the RRS side and has had a negative impact on UKR units.¹⁵

Comment. *A continuous and persistent IO is being conducted by RUS. A strong narrative is maintained across open source media and use of social media is carefully monitored. Reports which do not comply with the RUS domestic narrative are quickly removed. Operations in UKR are currently supported by the wider RUS population despite the increasing number of casualties which RUS denies.¹⁶ PRS are able to deploy hostile and malign messages across open source information systems largely without challenge. This enables them to influence sympathisers and encourage disruptive behaviours in those sympathetic. Hostile messaging can be used to generate public protests and disorder.*

Training Recommendations

- Units should try and integrate tactical PSYOPS into training serials to raise awareness of the threat, counter measures and opportunities for exploitation. The creation of 'simulated' hostile information environment training scenarios should be examined.
- Units should remind their soldiers of the social media threats and educate individuals on OPSEC.
- Deploying on exercise without PEDs should become the norm.

¹⁵ Entire UKR units have received SMS text messages. RUS have also sent threats against UKR family members via SMS text message.

¹⁶ Coverage of RUS KIAs have been controlled and removed from social media sites and often denied.

FIREPOWER

11. ATO experience. RUS has extensive long range artillery capabilities that the UKR are unable to range with artillery. This artillery capability has proven devastating on the battlefield, and on several occasions it was able to render entire Bns combat ineffective. 80% of UKR casualties are rendered from RUS artillery. Preparatory fires would last up to 3-4 hours, and would consist of 20-30 minutes of small calibre mortar fire, followed up by towed and self-propelled artillery, and finalised with MLRS. Mortar fire is used to prompt friendly unit displacement, followed up by heavy artillery fire to FIX and DESTROY displacing UKR forces. Primary targets for indirect fires are UKR C2 assets, as well as forward supply elements. The high degree of accuracy, especially when engaging moving columns/formations, implies sophisticated RUS planning and detailed/rehearsed triggers. This detailed planning and training is also shown through their effective counter-fire program.

Comment. *RUS provides cross border MLRS artillery in support of PRS and is also reported to have fielded limited thermo-baric munitions. RUS BM-30 SMERCH heavy MLRS has a 90km range which out ranges any Field Army artillery system. Deep fires artillery is used extensively to support ground manoeuvre. It is also reported to be used effectively in rapid counter battery fires intended to DISRUPT UKR fire missions and force UKR artillery to constantly relocate, reducing its time on target. RUS use of MLRS to achieve massed area fires, has been in stark contrast to NATO's on-going aspiration to develop precision strike.*

Training Recommendations

- Force Elements (FEs) must practice operating under the threat of mass area fires and cross border fires. This includes the use of field defences, operating under armour or from hardened/dug-in locations.
- Counter battery fire planning should be conducted for all IPB/STAP on exercises.
- Effective CSurv, EMCON and survivability measures (good battlefield discipline) should be exercised.
- Units should review DCC to include a re-invoigration of digging and the use of field defences.

12. ATO experience. RUS employment of snipers across the ATO have had a great effect on UKR operations. The snipers have had a very negative effect on the morale of UKR troops during manoeuvre. PRS/RUS snipers utilised 12.7mm Degtyarev sniper weapons, with Belarusian sourced optics. A UKR TTP is to remove all rank identification, due to the sniper threat. Skirts of chains have been added to wheeled vehicles so that snipers cannot engage dismounted troops.

13. ATO experience. UAF received sniper fire on several occasions which was closely followed by grenade launchers, crew served machine guns or AT systems. The UAF believe the PRS/RUS are using sniper in order to group UKR Soldiers together which enables them to efficiently attack with larger caliber weapons.

Training Recommendations

- Counter-Sniper training must be taught at the most basic level, to include the positioning of the commander.
- Units should practice exercising with rank identification removed.
- Units should discourage bunching and encourage individual displacement.
- A renewed focus on tourniquet training.

14. ATO experience. Enemy armour operates in groups of 3-4 tanks.¹⁷ UKR Anti-Armour TTP requires 3-4 RPG-7¹⁸ to hit IVO the same location to defeat the RUS Explosive Reactive Armour (ERA).¹⁹ The best UKR AT system is tank on tank, one account of action in the ATO involved 2 x UKR T-64BTs DESTROYING 5 x RUS / PRS T-72s in one engagement.

¹⁷ T-90s are utilized in a direct fire mode in support of infantry in urban environments. Tanks initially fire from a base line with a high rate of fire outside the range of UAF AT weapons. Tanks then pair up and peel round the flanks, often simultaneously, to out manoeuvre infantry.

¹⁸ UKR have large amounts of RPGs of various varieties.

¹⁹ T-72/80/90 MBTs.

Comment. PRS were supplied with T-72B3 and BMP-2 and both have been observed operating in BTG in the Donbas. Larger formations are based in FOBs close to the RUS / UKR border. Historically, RUS armour has sought to achieve overmatch by mass, however medium weight tanks such as the T72 have increasingly effective fire control systems and ammunition natures which enable them to utilise their standoff advantage to greater effect. The AT-14 KORNET²⁰ was observed in use by the PRS/RUS, this anti-tank missile has a tandem warhead designed to defeat ERA.

²⁰ A SACLOS laser beam riding anti-tank missile.



Training Recommendations

- During exercise planning IPE should indicate probable avenues of approach, SoM should consider the implications of being outranged by RUS armour. The use of dead ground, reverse slopes and moving through defiles should be emphasised.
- COAs should examine how mobility and reach can be enhanced by using other Joint weapons systems as the primary anti-armour capability.²¹
- Exercise planning should consider shaping enemy armour onto terrain where their stand-off advantage is negated.
- Infantry tank cooperation in urban and close terrain should be practiced along with the requirement to remain mobile or dig-in when exposed to an enemy AT direct fire threat.
- The integration of AT weapons to achieve overmatch in anti-armour ambushes should be practiced.

15. ATO experience. RUS is utilising GPS spoofing with great success against the UAF, forcing the UAF to return to the map and compass. This has led to UAF navigation errors while moving behind enemy lines. PRS are able to overcome the spoofing because their GPS devices have an additional algorithm (fill) installed.

Training Recommendations

- Units should become less reliant on GPS and practice manoeuvre by map and compass.

16. ATO experience. RUS is understood to have a sophisticated cyber-attack capability although the scale of their offensive capability is not fully understood. Denial of service attacks are thought possible and can probably be integrated with other forms of offensive operation. UAF reports suggest that the jamming of all radio frequencies occurs prior to an attack with the PRS/RUS sending mass SMS texts to UKR forces with IO themes/messages 5-15 mins before the attack. EW is integral to all RUS combat actions and technical advancements in many areas of EW are noted in RUS Army units. EW troops are found at bn and fmn level and they appear adept at subjecting UAF C2 to jamming as part of a combined arms approach. PRS/RUS can jam/eavesdrop on all forms of UKR communications and equipment that is operated remotely.

Training Recommendations

- EW attack should be brought into training to raise awareness. All HQs should practice EMCON in a hostile cyber environment. This might include the regular back up of mission critical data and reversionary mode operating practices.
- Units should practice reducing electronic emissions, for example by working under radio silence, reducing the volume of transmissions through good staff working practices and utilising the data and HCDR capabilities of BOWMAN more effectively.

²¹ Attack helicopter, fast air and precision anti-tank missiles.

MANOEUVRE

17. ATO experience. RUS possesses night vision capabilities²² and they are able to manoeuvre successfully against UAF during night operations. This has proven detrimental to UAF operating in the ATO whom lack any night vision capability and are unable to clearly detect RUS movements at night.

Training Recommendation

- Units should increase night training, particularly for offensive operations and manoeuvre in the battlespace.
- Route selection using cover should be re-emphasised.

18. ATO experience. There is extensive use of both vehicle and anti-personnel mines within the ATO, with widespread counter-tampering and booby-trapping of said devices.²³ UAF would attempt to disarm mines with grappling hooks and 12.7mm direct fire to mitigate any anti-tampering techniques. IEDs are also common. One PRS/RUS TTP is to rig a trip wire at a height in order to catch the antennae of a passing BMP.²⁴ UKR soldiers often ride on the top of the BMPs, making this a devastating tactic.

19. ATO experience. RUS has long considered mine warfare as integral to the conduct of defensive and offensive operations. RUS is capable of laying 3 x 1,000m rows AT minefield in 30 mins and would normally deploy SCATMIN to screen flanks. PRS have been provided with AT mines by RUS and these can be expected to be used extensively.²⁵ CW/RC IEDs have also been fielded and are used to disrupt and constrain manoeuvre by UKR forces along MSRs.

22 Image intensifying/thermal systems, which enables PRS/RUS 400m vision at night.

23 Double stacking with hand grenades and AT mines.

24 At this height, most other civilian/military traffic would not trip the wire.

25 However PRS ability to site tactical minefields within an integrated obstacle plan is less clear.



OFFICIAL-SENSITIVE

Handling Instructions: For MOD Use Only

20. ATO experience. In the beginning of ATO operations, IED usage was linked to ambushes (to initiate or exploit the effects). Since the estb of LOC, IEDs have transitioned to being a standalone weapon, which are not covered by fire. Most IEDs are RC, initiated by Motorola radios or remote control toys. The IED is normally composed of military grade explosives (artillery shells), due to the prevalence of military explosives/ordnance, Home-Made Explosives (HMEs) are not normally found used. PRS have also made use of VBIEDS by paying drivers to deliver packages to checkpoints, then detonating them upon arrival. IEDs and mines are now a greater threat to life than IDF and snipers.

21. ATO experience. The most popular PRS TTP is the 'booby trap' created by wiring a grenade onto a trip wire. It's quick, easy and requires no special skill to build. PRS put 'trip wires' on doors and the UAF are often reticent to use windows and are unaware of Explosive Method of Entry (EMOE) methods. UAF building entry is often conducted by driving an armoured vehicle into the wall with little consideration to collateral damage.



Training Recommendation

- Training serials should employ simulated IEDs to constrain mobility and freedom of action.
- Units should be encouraged to counter IEDs by using mobility as a preference over the capture and exploit of the device; through personal CIED drills, manoeuvring around vulnerable areas, and rapid breaching/defeat of devices when encountered.²⁶
- Ground Sign Awareness (GSA) must continue to be exercised.
- EMOE training should be mandatory and included in all urban training.

22. ATO experience. RUS airborne and air mobile forces are capable of air manoeuvre with air deployable artillery and light armoured vehicles including the 2S25 light tanks. Whilst little evidence of airmobile operations in the Donbas region has been identified, research indicates RUS aspirations to use airmobile forces in combined arms battle groups to SEIZE key terrain in advance of a link up with ground forces, or to complete encirclement.

Training recommendations

- Units should practice counter air manoeuvre operations in the vicinity of vulnerable points.
- Host Nation infrastructure bridging will likely need to be protected; this should be anticipated and practiced during training.

23. ATO experience. RUS employ PRS/ Guerrillas²⁷/SF on Sabotage Missions. UKR have observed multiple enemy elements throughout the ATO conducting sabotage missions on key infrastructure. This has an effect on both friendly operations and the local populace. During ceasefires, PRS/ SF guerrilla forces conduct infiltration operations into UKR territory. These infiltrations vary from single day operations to multi-day operations, and consist of 4-30 paxs. They conduct reconnaissance operations under the cover of civilian disguise to identify UKR force positions. They conduct sabotage, targeting UKR C2 and communication assets. They conduct destruction of key infrastructure, to include roads and bridges. They conduct provocation operations at UKR checkpoints. They infiltrate non-aligned villages and towns, using LNs as human shields, they force UAF to conduct escalation of force procedures which presents a serious risk for collateral damage and subsequent enemy messaging as these attacks are usually coordinated in conjunction with pre-planned media coverage and timed to coincide with OSCE observer missions.

Training Recommendation

- Good marksmanship and greater consideration of ROE are the best mitigation against collateral damage which should be exercised.
- LOAC must continue to be taught.

²⁶ Route clearing and proving by combat engineers will remain a key requirement for enabling movement and sustainment along lines of supply/communication.

²⁷ RUS also deploy guerrillas known as "the rotten"(many with previous military experience) that are bound for prison, are given a choice between prison and deployment to the Donbass. The guerrillas are commanded by RUS SF officers.

PROTECTION

- 24. ATO experience.** UAF has no ability to counter the RUS AD systems that are employed across the ATO. This has caused multiple aircraft shoot downs.²⁸ This has forced the UAF to ground most of their aircraft fleet.
- 25. ATO experience.** PRS were cutting holes in the roofs of buildings and covering it with a removable door. When an aircraft would fly over the building, the PRS would open the door and employ shoulder fired munitions against the helicopters. Because of the open terrain in and around the ATO, UKR helicopters were unable to mask their presence using terrain. The PRS were also using civilian trucks in the same fashion.

Comment - RUS has supplied MANPADs and SA-22²⁹ to the PRS. A RUS BTG has an organic AD PI which is tasked to DESTROY enemy's AD capabilities to achieve local air superiority. When supported by medium to long range ADs such as the SA-9 and SA-6 system³⁰ the PRS/RUS deployed in UKR have a credible mobile layered AD system over key terrain.

Training Recommendations

- Units should focus on mobile operations and should train under a hostile air environment. This includes practicing the construction of field defences when static, the use of air sentries and the construction of dummy positions.

- 26. ATO experience.** The relationship of various units operating in the Donbass is difficult to determine, causing issues in identifying Friendly Forces (FF). Vehicle markings change regularly and UAF soldiers wear coloured arm bands and use their accents to identify themselves as FF. However the orders to conduct vehicle markings/colour bands changes are often slow to be disseminated resulting on blue on blue incidents.

Training Recommendations

- Identification of FF for personnel and vehicles must be practiced by day, night and through thermal.
- 27. ATO experience.** RUS are able to quickly identify the locations of UKR transmissions, this includes mobile phone, tactical radio, and Motorola civilian band radios. Once identified as UAF communications, RUS rapidly launch artillery strikes on the location of the intercepted transmission.
- 28. ATO experience.** RUS are employing acoustic capable equipment that has the capability to detect and locate snipers in the battle space. When a sniper fires a round, his position is acquired and RUS launch precision artillery strikes on the sniper's location.

Comment. PRS employ weapon locating platforms for example ZOOBARK which can acquire active targets out to 30 km. This gives them a mobile Weapon Locating Radar (WLR) capability which can be coordinated with RUS Army counter battery fires within several minutes. UAF artillery has reportedly unmasked as a result of spoofing fires from light mortars, and then is then detected by WLR and subsequently subject to debilitating counter battery fire.

²⁸ Both fixed and rotary winged.

²⁹ A vehicle mounted short to medium range AD systems.

³⁰ SA-6 BUK is an anti-aircraft missile system with an acquisition range of up to 42 km and a reported operating altitude of 25 km. An SA-6 is believed to have been used to destroy Malaysian Airline MH17.

Training Recommendation

- Units must be able to move to survive, be prepared to dig defences³¹ and expect to be subject to En OS. Artillery batteries and mortar platoons should practice regular 'shoot and move' tactics. All deployable HQs and static sites should seek to reduce their visual, thermal and electronic signature, employ CSurv techniques, disperse and practice rigorous EMCON.

Comment. *There is no evidence of RUS forces using CBRN agents in UKR but RUS doctrine suggests that the tactical employment of localised CBRN agents is still considered legitimate. The BTG has a chemical troop as part of its standard ORBAT which it is assumed is capable of conducting CBRN operations. The use of CBRN agents by a PRS or other proxy forces cannot be discounted. PRS may deliberately release Toxic Industrial Hazards including chemicals to disrupt or deceive an adversary.*

Training Recommendation

- Units should re-focus on Individual/collective counter-CBRN training beyond just the application of MATT4.
- CBRN training should be included in all training serials; ensuring soldiers can complete missions while being contaminated (*Fight Dirty*).
- Training should emphasise the pre-emptive neutralisation of En CBRN capability.
- Training should include the accidental or deliberate release of Toxic Industrial Materials.

- 29. ATO experience.** RUS dress in 'Nikav' suits made from 'Avizant' material which stops thermal signature and 5.45mm bullets, making them extremely hard to identify and provides them with integral ballistic protection. Heavier weapons systems (7.62mm) can defeat 'Nikav' suits.

Training Recommendation

- Soldiers must be taught and tested on all available weapon systems; not just their personal weapon.
- 30. ATO experience.** The people that the UAF are fighting in the ATO look and think like the UAF do. Killing the 'enemy' is an unusually psychologically damaging activity, akin to a civil war.

Training Recommendation

- Post-traumatic stress disorder (PTSD) should inform planning.
- Post-operational counselling should be exercised.

31 RE or assault pioneer support cannot be assumed.

SUSTAINMENT

31. ATO experience. PRS in UKR have attacked UAF medical treatment facilities. UAF cannot achieve the 'Platinum 10 mins' clinical timelines that were achieved on Op HERRICK. This may also not be possible by UK FE during war fighting.³²

Training Recommendation

- Mass casualty serials should be regularly practiced on exercise with further emphasis on triage and the treatment of casualties forward.

32. ATO experience. Conscripted troops turned up in the ATO with little idea of how to do their jobs – eg drivers unable to operate their vehicles. When a vehicle breaks down in the ATO, the crew accompany it to the nearest engineer repair point and are given a lesson as the repair takes place.

Training Recommendation

- Crews must be exercised in the basic and intermediate level of repairs on all vehicles, to ease the burden on the REME.
- Responsibility must be exercised to the lowest level.

³² Achieving the golden hour should only be an expectation of those casualties that most need it.



Hybrid Warfare Lessons Learned from the ATO

1. Political agents, Spetsnaz “little green men”, volunteers and mercenaries provide a variety of low visibility insertion, sabotage, training and advisory options. Techniques include building seizures, infrastructure attack, intimidation of police, cyber disruption, political assassination, kidnapping of children, hostage taking, torture and mutilation.
2. Low-intensity conflict can rapidly escalate to high-intensity warfare for which local security services are unprepared to deal with - this is particularly true for urban fighting, key terrain strong points and critical road junctions.
3. Enemy artillery including MRLS now utilise advanced (scatterable mine, top attack & fuel air) munitions, which in combination with UAV target acquisition, can cause very high casualties rates in one strike - notable because most NATO nations are withdrawing those munitions from their own forces.
4. MBTs, protected by Reactive Armour, remains central to high-intensity combat; deep armoured raids are prevalent on the dispersed modern battlefield.
5. Light infantry vehicles, are disproportionately vulnerable to enemy direct and indirect fires. Mechanised infantry needs MBT equivalent protection and mobility for the high-intensity battlefield.
6. Current Reactive Armour defeats most ‘infantry fired’ single-warhead AT weapons - notable because only our Javelin ATGW has a tandem AT warhead missiles capable of penetrating reactive armour. In the absence of Javelin, light infantry units are vulnerable to overrun or being out flanked by armour.
7. The “hybrid” battlefield is non-linear, with real opportunity for decisive armour manoeuvre. Prepared “dug in” defensive strong points, supported by artillery, can inflict heavy losses on the armour attacker. However, in static positions they are also vulnerable to mass and being outflanked/enveloped.
8. Superior AD can drive CAS and AH off the battlefield. We can no longer assume air superiority and this will reduce our FoM and ability to achieve air/land integration.
9. Communication systems (without digital encrypted radios) are vulnerable to jamming, interception and real-time targeting. EW has entered a new era and its effects can be both unexpected and significant.
10. UAVs, and drones are indispensable for operational intelligence and tactical targeting and they are becoming abundant on the modern battlefield. A RECCE/ STRIKE capability has now been fielded at the tactical-operational level. Without this capability Land Forces will effectively be blind and will become victims of enemy surprise.

GLOSSARY OF TERMS

1. Ambiguous Warfare. Ambiguous warfare consists of hostile actions that are difficult for a state to identify, attribute or publically define as coercive uses of force. The unclear nature of hostile actions, the responsible agent and the threat that they pose makes it difficult for a state to respond as they would to conventional armed attacks or threats. *Source: "Ambiguous Warfare", DCDC, Oct 2014.*

2. Hybrid Warfare (Western view). A broad, complex, adaptive and highly integrated combination of actions with overt and covert, military, paramilitary and civilian, conventional and non-conventional means in pursuit of an objective. *Source: "The Danger of Ambiguity", DCDC, 2015.*

3. Hybrid Warfare (Russian view). Russian hybrid warfare combines different types of threats including: subversion, physical and information provocation, economic threats, posturing with regular forces, the use of Special Forces, and use of paramilitary and political organisations. These can be used together to create a highly complex

and dynamic Battlespace which can be difficult to counter collectively. Russia favours the hybrid tactics of subversion, deniable operations by third-party combatants and the targeting of strategic individuals and facilities as they are hard to combat, low cost and can be used to open political divisions in the west. *Source: LIFC "How Russia fights version 2, Sept 15".*

4. Irregular activity. The use, or threat, of force, by irregular forces, groups or individuals, frequently ideologically or criminally motivated, to effect or prevent change as a challenge to governance and authority. Could include a mix of insurgency, terrorism, criminality, disorder and illegitimate regimes. *Source: JDP 01 2nd Edition.*



5. Maskirovka (a little masquerade).

The Russian Armed Forces' strategy of deception, executed to deliberately surprise and deceive potential threats to Russian Armed Forces' capabilities, intentions and operations, thereby causing the potential threat to take specific action (or inactions) that will contribute to the accomplishment of the objective. Maskirovka can be practiced at the tactical, operational and strategic levels. *Source: LIFC "How Russia fights version 2, Sept 15".*

6. Outside State Sponsor (OSS). This refers to any recognised state that is a member of the international system engaging in training, mentoring, equipping and guiding an irregular adversary that is operating outside of their recognised borders. *Source: SO2 Irregular Warfare.*

7. Proxy Warfare. A war instigated by a major power that does not itself participate. While this can encompass a

breadth of armed confrontation, its core definition hinges on two separate powers utilizing external strife to attack the interests or territorial holdings of the other. This frequently involves both countries fighting their opponent's allies, or assisting their allies in fighting their opponent. *Source: Princeton definitions.*

8. State Sponsored Proxy Forces (SSPF).

This refers to all non-state irregular forces with an Outside State Sponsor (OSS) providing advice, support and political protection. SSPF operate within a broad framework of control that can range from direct command and control from the OSS to looser influence and control. SSPF vary from well trained, well led and well equipped forces, such as Hezbollah, to more loosely organised irregular forces such as Lashkar-e-Tabia. *Source: SO2 Irregular Warfare.*



Glossary of Armaments and Military Equipment



T-90



2S25



T-80U



BMP-2



T-72



BMP-3



T-64



BRT-90

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Handling Instructions: For MOD Use Only



**BM-30 Smerch
(9A52-2 Smerch-M)**



**SA-7
'Grail'
(9K32 Strela-2)**



**SA-22
'Greyhound'
(Pannstsr-S1)**



**SA-18
'Grouse'
(9K38 Lgla)**



**SA-6
'Gainful'
(2K12 'Kub')**



**RPG-7
(HEAT/Frag &
Thermobaric)**



**SA-9
'Gaskin'
(9K31 Strela-1)**



**RPG-29
(HEAT &
Thermobaric)**



**Zu-23-2
'Sergei'
(2A13)**



**DRAGUNOV
Sniper Rifle
(SVD-63)
7.62mm**



**AT-14
'Spriggan'
(9M133 Kornet)**



**DEGTAREV
Sniper Rifle
(KSVK)
12.7mm**

Russian Armaments and Military Equipment Identified in the East of Ukraine



Automated radio control complex "Torn-MV"
(August 2015, Donetsk)



Electronic warfare complex MKTK-1A "Judoist"
(January 2015, Luhansk)



Armored vehicle "Vystrel"
(December 2014, Luhansk)



Air defense missile-gun system "Pantsir-S1"
(January 2015, Shahtarsk, Donetsk region)



UAV "Eleron-3SV"
(August 2015, Donetsk)



UAV "Forpost"
(May 2015, Avdeyevka, Donetsk region)



UAV "Takhyon"
(June 21, 2014, Luhansk region)



UAV "Orlan-10"
(June 29, 2014, Luhansk region)



Radar "Aistyonok"
(January 2015, Donetsk)



Radar PSNR-8M
(July 2015, Donetsk)



MANPADS "Igla"
(2014, Marinovka, Donetsk region)



Anti-tank missile "Konkurs-M"
(March 2015, Donetsk)



**Cluster warhead of 9M55K projectile
for MLRS 9K58 "Smerch"**
(October 2014, Donetsk region)



**Combat element 9N235 of cluster warhead of 9M551
projectile for MLRS 9K58 "Smerch"**
(July 2014, Kramatorsk, Donetsk region)



PMN-2 anti-personnel mines
(September 2015, Gnutovo, Donetsk region)



MON-50 anti-personnel mine
(April 2015, Donetsk region)

RUSSIAN ARMAMENTS AND MILITARY EQUIPMENT IDENTIFIED BY OSCE IN THE EAST OF UKRAINE (not used by the Armed Forces of Ukraine)



Armored vehicle Ural-63095 "Typhoon"
(February 2015, Donetsk)



Multiple thermo baric rocket systems TOS-1 "Buratino"
(January 2015, Kirovske, Donetsk region)



Self-propelled mortar 2S4 "Tulpan"
(January 2015, Ilovaysk, Donetsk region)



Anti-aircraft missile system "Tor"
(January 2015)

9



Radio transmission equipment R-140M
(February 2015, Stanica Luhanska, Luhansk region)



Special sniper rifle "Vintorez"
(May 2015, Luhansk region)



Grenade launcher GP-34
(May 2015)

DETECTED SATELLITE COMMUNICATION ASSETS OF RUSSIAN OCCUPATIONAL FORCES IN THE EAST OF UKRAINE



**Satellite Communication Station
R-440 "Crystal"**

Frequency range, GHz:	
in reception mode	3,4-3,9
in transmission mode	5,725-6,225
Transmitter output, kW	0,22
Energy consumption	4
Number of channels:	
telephone (1200 bps)	3
telegraph (100 bps)	2
Data transfer rate, kbs	0,1-4,8
Crew	3



**Satellite Communication Station
R-438 "Barier-T"**

Frequency range, GHz:	
in reception mode	3,635
in transmission mode	5,860
Transmitter output, W	25
Number of operating frequencies	10
Data transfer rate, kbs	1,2-2,4
Crew	1

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DETECTED RADIOCOMMUNICATION ASSETS OF RUSSIAN OCCUPATIONAL FORCES IN THE EAST OF UKRAINE



Radio Station R-168-100KAE

Frequency range, MHz	1,5-30
Transmitter output, W	10-100
Receiver sensitivity, μ V:	
telephone	2,0
telegraph	1,5
Communication range, km:	
antenna "ASH-4"	25-60
antenna "AZI" (parking arrangement)	350
Weight, kg	28



Portable Radio Station R-187-P1

Frequency range, MHz:	
in reception mode	1,5-520
in transmission mode	27-220/220-520
Transmitter output, W	1-4
Receiver sensitivity, μ V	0,5
Communication range, km	4
Data transfer rate, kbs	64
Maximum time of continuous operation, h	6
Weight, kg	1,2

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DETECTED SIGNAL INTELLIGENCE ASSETS OF RUSSIAN OCCUPATIONAL FORCES IN THE EAST OF UKRAINE



SIGINT Station 1L222 "Avtobaza"	
Target detection range, km	150
Number of emission sources simultaneously tracked	60
Time of deployment on the run, min	45
Crew	4
In operational service, since	2011



SIGINT and C2 Station 1L267 "Moskva-1"	
Target detection range, km	400
Scanning range, deg: elevation	0-30
azimuth	360
Time of deployment on the run, min	45
Crew	4
In operational service, since	2013

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Station "Shipovnik-Aero"	
Minimum time reaction for organizing the UAV counteraction starting from the signal detection to its suppression, sec	1-25
Frequency range, MHz	25-2500
Direction finding accuracy, degr	3
Navigation accuracy, m	100
Time of deployment on the run, min	45
Crew	3



Automated Radio Control Complex "Torn-MV"		
	HF	VHF
Frequency range, MHz	1,5-30	30-3000
Direction finding accuracy, degr	1-3	
Minimum time for electro magnetic contact with radiation source, ms	5-10	0,5-2

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DETECTED AERIAL RECONNAISSANCE ASSETS OF RUSSIAN OCCUPATIONAL FORCES IN THE EAST OF UKRAINE



UAV "Forpost"	
Maximum /cruise speed, km/h	204/130
Range, km	150-250
Endurance, hours	17,5
Avionics	Camcorder, photo camera, thermal camera modules

UAV "Orlan-10"	
Maximum/cruise speed, km/h	150/130
Range, km	120
Endurance, hours	10
Avionics	Camcorder, photo camera, thermal camera modules

UAV "Takhyon"	
Maximum/cruise speed, km/h	120/80
Range, km	40
Endurance, hours	2
Avionics	Camcorder, photo camera, thermal camera replacable modules

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SIGINT Aircraft Il-20M	
Crew	13 (8 – technical staff)
Maximum range, km	6200
Endurance, h	12
Payload	side-looking radar "Igl'a-1"; SIGINT stations "Vichnia", "Romb-4", "Kvadrat-2"; aerial camera A-87P (SIGINT depth up to 400 km)

Airborne Warning and Control System A-50	
Simultaneously tracked targets	50–60
Simultaneously directed fighters	10–12
Detection range, km	220–240
Radio link distance, km	
HF	2000
VHF	400
ACS radio link distance, km	
UHF	350
HF	2000
SAT	>2000



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DETECTED AERIAL RECONNAISSANCE ASSETS OPERATING FOR RUSSIAN OCCUPATIONAL FORCES IN THE EAST OF UKRAINE



Su-24MR

Reconnaissance Aircraft Su-24MR

BKR-1 onboard reconnaissance complex includes:

Side-looking radar "Shtyk" - provides visual range of 24 km on each side of heading;
Television reconnaissance system "Aist-M" - provides reconnaissance at low altitudes;
Infrared reconnaissance system "Zyma";
Laser reconnaissance system "Shpil-2M";
SIGINT system "Tangazh";
Frame aerial camera A-100;
Panoramic camera AP-402.

Aircraft Su-34 with BKR-3 BRC container

The aircraft is equipped with detachable basic reconnaissance complex (BRC) mounted in external containers "Sych" having three kitting variants – radar, optoelectronic, signal intelligence: container for conducting radar reconnaissance using side-looking radar M402 "Pika" (scan line width on both sides of flight direction: up to 60 km over the ground and 120 km over the sea; linear resolution: 2-5 m over the ground, 6-20 m over the sea); container for conducting optoelectronic reconnaissance with TV camera "Anrakt-TV" (camera resolution 0,5 m from the altitude of 0,5 km) and dual-mode line scanner of infrared range M433 "Raduga-VM"; signals intelligence container with devices providing detection and identification of radio emission sources "Anrakt"



Su-34 with BRC container

DETECTED ELECTRONIC WARFARE ASSETS OF RUSSIAN OCCUPATIONAL FORCES IN THE EAST OF UKRAINE



"Rtut'-BM"

Radioelectronic Warfare Station "Rtut'-BM"	
Frequency range, MHz	95-420
Jamming range, km	1
Chance suppression	at least 0.8
Number of lines suppressed	6
Time of deployment on the run, min	10
Crew	2



"Leer-2"

Radioelectronic Warfare Station "Leer-2"	
Analysis frequency range, MHz	0.1-18000
Radio reconnaissance range, MHz	20-2700
Radio suppression range, MHz	20-2700
Azimuth accuracy, degr	3
Navigation accuracy, m	up to 15

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RP-377LA "Lorandit"

Radioelectronic Warfare Station RP-377LA "Lorandit"	
Frequency range, MHz	20-2000
detection	25-2000
direction finding	100-500
Frequency range of jamming, MHz	3
Azimuth accuracy, degr	100
Transmitter output, W	20 (10)
Time of deployment on the run, min	



R-330M1P "Diabazol"

Radioelectronic Warfare Station R-330M1P "Diabazol"	
Frequency range, MHz:	
search	100-2000
suppression	100-965/100-400/1500-1900
Azimuth accuracy, degr	3
Time of deployment on the run, min	40

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DETECTED NEW MODELS OF ARMORED VEHICLES IN THE EAST OF UKRAINE



Armored Personnel Carrier KamAZ-43269 "Vystrel"	
Crew	2+8 passengers
Weight, t	10
Dimensions, m	
length	5,3
width	2,5
height	2,3
Armament	14,5-mm KPVT machine gun or 12,7-mm "Kord" machine gun
Speed, km/h	90
In operational service, since	2008



Infantry Mobility Vehicle "Tigr"	
Crew	2+7 passengers
Weight, t	7,4
Dimensions, m	
length	5,7
width	2,4
height	2,3
Armament	12,7-mm "Kord" machine gun
Speed, km/h	140
In operational service, since	2013

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DETECTED NEW AIR DEFENCE SYSTEMS IN THE EAST OF UKRAINE



Air Defense Missile-Gun System "Pantsir-S1"	
Engagement zones, km:	
<u>Missile armament</u>	
range	1–20
altitude, km	0,005–15
<u>Gun armament</u>	
range	0,2–4
altitude, km	3
Maximum velocity of engaged targets, m/s	1000
Number of simultaneously engaged targets in the ±45° sector	4
Reaction time, s	4–6
Ammunition load, pcs.:	
SAM on launchers	8–12
rounds	750–1400
In operational service, since	2012



MANPADS 9K333 "Verba"	
Engagement zones, km:	
range	6
altitude	4,5
Maximum velocity of engaged targets, m/s	500
Warhead weight, kg	1,5
In operational service, since	2014

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Lessons Aide-Memoire

"The ability to learn faster than your competitor may be the only sustainable competitive advantage you have"

Murrell and Walsh

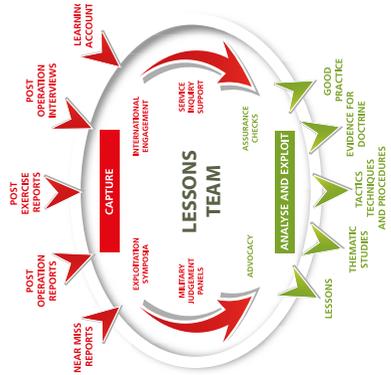
What is a Lesson?

A lesson is an experience, example, or observation that imparts beneficial new knowledge or wisdom, or promulgates innovative practices and successes.

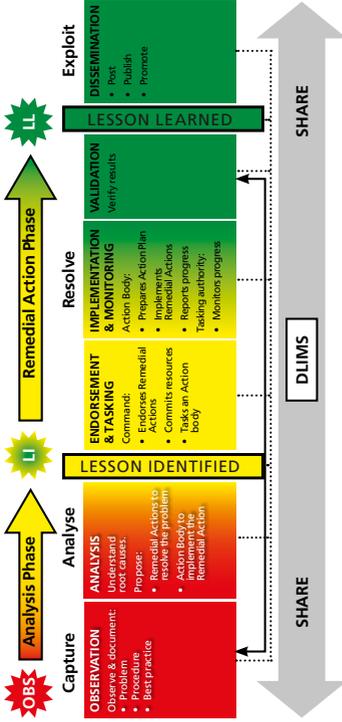
Why are they important?

Lessons contribute to Force Development, they provide evidence for the requirement to change doctrine, training and equipment.

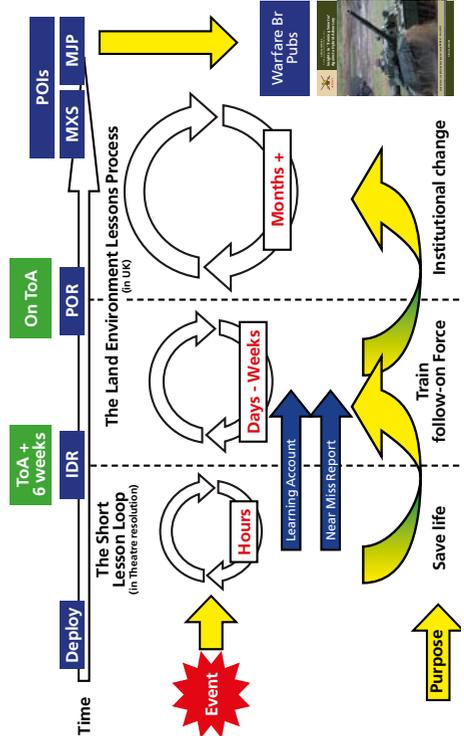
Lessons Bible: LFSO 1118 - Learning Lessons in the Land Environment http://defenceintranet.diffr.mil.uk/libraries/1/Docs/2014/0802.6/LFSO_1118.pdf



OPERATIONAL LESSONS LEARNING PROCESS



OPERATIONAL LAND LESSONS LOOPS



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Handling Instructions: For MOD Use Only

The Lessons Team is responsible for driving lesson learning from operations and training in order to provide the most up to date knowledge to the Field Army, so that operational performance can be improved and wider Force Development informed.

If you have deployed on an operation or exercise please send a copy of your POR / PXR, STTT Report, or observations to FdArmy-Warfare-Lessons-Mailbox



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Lessons Team, Warfare Branch,
Land Warfare Development Centre
Headquarters Field Army, Waterloo Lines
Imber Road, WARMINSTER,
Wiltshire, BA12 0DJ

Civ 01985 22 2626
Mil 94381 2626
DII FdArmy-Warfare-Lessons-Mailbox
Email FdArmy-Warfare-Lessons-Mailbox@mod.uk



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