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The development of airborne warfare tactics (1935–2020)

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The article gives an overview of the development of airborne warfare tactics from 1935 to 2020 based on the methods of delivery applied, such as deployment by parachute, helicopter-based air mobility and airlanding, relying on military doctrines and manuals. The role of air-mechanization in the changes of the nature of airborne warfare is discussed as well.

KEYWORDS: airborne warfare tactics, paratrooper, helicopter-based air mobility, airborne operations, special operations, doctrine, manual

A légideszantcsapatok harceljárásának fejlődése (1935–2020)

A cikk a légideszantcsapatok harceljárásának fejlődését tekinti át 1935-től 2020-ig, a légideszantok kijuttatási módjai – az ejtőernyős deszant, a helikopteres légimozgékonyság, illetve a repülőgépes leszálló deszant-módszer – szerint, szabályzatokra és doktrinákra támaszkodva. A tanulmány a légi gépesítés szerepét is vizsgálja a légideszantcsapatok harceljárásában.

KULCSSZAVAK: légideszant harceljárás, ejtőernyős deszant, helikopteres légimozgékonyság, légi szállítású műveletek, különleges műveletek, doktrína, szabályzat

Introduction

As a result of technological developments, since the beginning of the 1930s it has become possible to insert ground forces into denied territories through airborne operations, which is generally referred to as airborne warfare. Airborne operations were widely conducted in World War II, mainly by German, Soviet, American and British forces. The main focus was on light infantry paratrooper operations, while heavier glider and fixed wing operations were carried out only to reinforce parachute assault units. The Soviets (Spetsnaz) and the British (Special Air Service – SAS) deployed

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special operations troops in large numbers as well. Airborne operations also became part of the operational theories of the great powers (the Soviet theory of deep battle operations or the German theory of armoured warfare).[1]

What is exactly meant by the term airborne operations? A definition of the concept may be found in NATO Tactical Air Doctrine ATP-33 B, which also provides a list of the support functions related directly to airborne operations.[2] In section 5 of the doctrine, dealing with tactical airborne operations, the following categories can be found:

- Paratrooper airborne operations (parachute jumps and parachute drops);
- Airmobile operations (transport of forces and cargo by helicopter);
- Force delivery (equipment and cargo) by airlanding.

The supply of paratroopers by fixed wing aircraft and helicopter, medical evacuation (MEDEVAC), and special airborne tasks (the airlift of special forces) related to airborne operations are also listed in the doctrine.

Airborne operations have made it possible to achieve the following objectives:

- mseizing bridges, straights and mountain passes until the arrival of additional forces *(e.g. operation Market Garden 1944);*
- securing the flanks of landing operations *(e.g. D-day, 1944);*
- inserting special forces behind enemy lines for the purpose of reconnaissance and diversion *(e.g. SAS in Europe, 1944).*

Different paratrooper units were deployed using different methods, depending on the topographic conditions of the target zone:

- light infantry and diversionary troops were delivered by parachute to any given terrain;
- light mechanized forces were deployed to flat terrain by gliders;
- airportable forces were delivered to captured airfields by transport aircraft.

Airborne operations were usually conducted using a combination of the above means of delivery.

During combat activities, airborne troops were employed as:

- infantry in the vicinity of the landing zone of the unit;
- or farther away from the landing zone if their forces were mechanized (air-mechanization).[3]

Combat vehicles were first airlifted into military operations by gliders between 1939–1945, and the same capability became available again during and after the Vietnam War with the introduction of air mobility. In the meantime, tactics developed during World War II based on the airlanding of mechanized airborne troops on captured airfields by fixed wing aircraft had also undergone considerable changes.

1 Glantz 1984.

2 ATP-33B 1997.

3 Franz 1992, 59.

1. Development of airborne warfare tactics according to means of delivery

1.1. Delivery by parachute

By the 1930s, the widespread use of the airplane and the parachute had made it possible to deploy light infantry troops behind the enemy lines by parachute. Appendix C of Army Field Manual FM 3-90 (Airborne and Air Assault Operations) deals with airborne operations and paratroopers.[4] Paratrooper operations are discussed under the section *Airborne Operations*. The tactical echelons of airborne operations are the following: assault echelon, follow-on echelon, and the rear-guard. After capturing the target objectives determining the airhead, the assault echelon secures the undisrupted delivery of airborne troops, equipment and supplies. The follow-on echelon can include light and heavy combined forces. Based on the commander's decision, heavy weapons are delivered either by parachute or by airlanding.

Due to advances in air defence technology, the large-scale deployment of air assault troops had become increasingly risky by the end of the 1950s. At the same time, the increasing transport capacity of gas turbine powered transport aircraft made it possible to airlift heavy equipment such as light tanks and self-propelled guns. Following the development of advanced parachute cargo delivery systems (LAPES - Low Altitude Parachute Extracting System, retrograde rockets, etc.), airborne troops were augmented with some heavy organizational elements (e.g. armoured battalion), which increased their combat power and mobility. Starting in the 1980s, the American 82nd Airborne Division (paratrooper) became fully mechanized with air-droppable wheeled vehicles, so the division had 3,200 vehicles in total, including 1,400 HMMWV trucks, LAV-25 light armoured reconnaissance vehicles, and an armoured battalion equipped with 56 Sheridan light tanks.[5] Since the end of the 1970s, the British airborne brigade has been equipped with Scorpion, Scimitar, Spartan and Stryker combat vehicles against limited armoured targets.[6] Recently, following the introduction of the Sprut airborne tank, the commander of the Russian airborne troops has made a revision of the tactical doctrine of Soviet airborne forces, which is now centred on a more intensive offensive role.[7]

1.2. Delivery by airlanding

If paratroops captured an airfield behind enemy lines, light infantry units were air landed by transport aircraft in order to reinforce the paratrooper echelon. Appendix C of Army Field Manual FM 3-90 (Airborne and Air Assault Operations) deals with airborne operations, including paratrooper and airmobile operations as well.[8] According to the American approach, the airlift and delivery of troops by means of

4 FM 3-90 2001, App. C.
5 Szilágyi 1998. 29.
6 Head 1999, 9.
7 Bagi 2009, 4.
8 FM 3-90 2001, App. C.

airlanding is treated as part of airborne operations. The place of airborne troops delivered by airlanding is also determined by the manual; it is the follow-on echelon. Field Manual FM 100-5 lists the different types of infantry units, making a difference between airportable light infantry and airborne infantry designed specifically for the purpose of air transport.[9] Airborne infantry troops are provided anti-tank support by light armoured cavalry units[10], since due to their mass these types of combat vehicles are the most suitable for air transport. Similarly to Stryker brigades, part of the armoured reconnaissance organization is also airportable, so they can be used as the next echelon in airborne operations. However, while some light wheeled vehicles of the armoured reconnaissance forces (e.g. LAV 25) can be airlifted into operations by transport helicopters, heavier wheeled combat vehicles have to be transported and air landed by C-130 aircraft, which requires first capturing the target airfield by means of air assault operations. Operations conducted by airplane are described in Field Manual FM 90-26[11], where both parachute operations and operations conducted by the airlanding of troops are categorized as airborne operations.

By the 1950s, the increased capacities of gas turbine powered transport aircraft made it possible to airlift heavy equipment such as tanks and personnel carriers, which brought about fundamental changes in airborne tactics and the application of forces delivered by airlanding. As a result, in the 2003 Gulf War several airborne operations were conducted where paratroopers captured an airfield, which was followed by the airlanding of armoured combat vehicles such as M1 tanks by C-17s.

Today, the airlanding of troops constitutes an increasingly important part of the warfare tactics applied in the follow-on echelons. The American Objective Force program, launched in 1992, aimed to create more mobile forces and improve the effectiveness of airportable mechanized organizations, was scheduled to be reached by after 2010.[12] As part of this program, a brigade equipped with light combat vehicles should be set up, which could be airlifted to any part of the world within 4 days. Today, this type of airborne organization is the Stryker brigade. Using Stryker wheeled armoured vehicles, highly mobile airborne battlegroups were created, called the Stryker Brigade Combat Team. Stryker brigades are transported by C 130 Hercules transport aircraft, which are available in large numbers. The airportability and deployability of the new brigade level organization were tested for several hundred kilometres in an exercise organized at Fort Irwin in 2003.[13]

1.3. Helicopter- and convertiplane-based air mobility

By the 1950s, following the rise of modern air defence, it had become increasingly risky to deliver paratroops into battle by airplane. As a result, parachute operations were gradually replaced by airmobile operations, which was made possible by

9 FM 100-5 1997, 59.

10 FM 100-5 1997, 61.

11 FM 90-26 1990, CH-1 1-6. and 1-7. A. (1)

12 Owen and Fogg 2001, 11.

13 Reardon and Charlston 2007.

advances in the development of gas turbine engine helicopters. The first time such helicopters (UH-1) were used in large numbers was the Vietnam War. Based on these new assets, the US military conducted the first airmobile operations in the world. The Soviet military developed its own airmobile capabilities and tactics during the Afghan intervention (1979-1988).

Field Manual FM 71-100-3 (Air Assault Operations) describes the development of American airmobile organizations and the organizational structure of higher level airmobile units.[14] In the description of helicopter-based airborne organizations the expressions air assault and airmobile are both used.[15] Field Manual FM 71-100-2 (Chapter 1.: Light Infantry, Airborne) differentiates between air assault operations in the landing zone involving combat activities and airmobile operations in a secured landing zone.[16]

Airmobile tactics underwent a significant qualitative change from the Vietnam War to the end of the Soviet – Afghan War (1968-1988):

- air mobile troops were reinforced and supported by attack helicopters (AH-1, AH-64, Mi-24) in both the Soviet and the American military;
- new transport helicopter types (Chinook, CH-53, Mi-6/26) capable of airlifting heavy equipment such as combat vehicles and guns were introduced.

The development of gas turbine engine helicopters and the increase of their transport capacity along with the introduction of heavy transport helicopters brought about the birth of a new, qualitatively different type of operation (Air Mechanization Stryke), which made mechanized airborne troops more mobile after landing.[17] As a result, new airborne warfare tactics were developed: For example, in the 1980s German airborne troops started to organize their Wiesel combat vehicles, which could be airlifted by CH-53 helicopters due to their small size, into anti-tank battalions.[18] Supported by attack helicopters, these anti-tank battalions are able to conduct offensive operations against armoured targets.[19] A Russian airborne brigade, equipped with BMD infantry fighting vehicles, is delivered into military operations by helicopters.

Based on the greater maximum range of convertiplanes, aircraft capable of both vertical flight like a helicopter and fast, forward speed like a conventional airplane, the United States Marine Corps has established its new operational concept based exclusively on long range airlift, without naval landing operations conventionally launched from the sea (discussed in more detail under 2.2).[20]

14 FM 57-35 1973.
15 FM 71-100-3 1996, Intr. 2.
16 FM 71-100-2 1993, Chap. 1.
17 Grange et al. 2002.
18 Marek 1992.; Jarnot 1996, 38. and Mettler 1995, 24.
19 Marek 1992.
20 Reed 2013.

2. Development of airborne warfare tactics in accordance with military doctrine

2.1. Role of airborne capabilities in the Air-Land Battle Doctrine

The Air-Land Battle Doctrine was developed for the American military between 1980-1982.[21] The Air-Land Battle Doctrine is based on air superiority, where the Allies attack areas behind enemy lines from the air up to 300km using attack helicopters and strike aircraft. The armoured battlegroup responsible for counterattack and the supporting airborne units are effectively assisted by the Air Force on enemy territory. Reserves deployed forward to counterattack can be air or ground manoeuvre elements, as air landed or air assault units of the land forces as reserve elements are capable of rapid response.[22] The ALB theory is summarized in Field Manual FM 100-5, regarding the mobility of airlifted troops after landing as a capability that should be further enhanced.[23] The purpose of air mechanization is to help achieve that objective, which is today represented by the airportable Stryker brigades.[24]

2.2. Role of airborne capabilities in the Air-Sea Battle Doctrine

The Air-Sea Battle concept was established in 2009.[25] This operational theory was developed by the American Air Force, Navy and the Marines, within the framework of which a higher level cooperation was designed to enhance joint capabilities with a focus on command and control, intelligence, reconnaissance and electronic warfare.

The creation of the Air-Sea Battle Doctrine resulted in closer and more effective cooperation between the navy and the air force, and airborne organizations experienced a breakthrough in naval and marine operations. Airborne operations conducted during the Afghan War in 2001 had already projected the birth of a new type of Marine warfare, in which the Marines no longer rely on conventional amphibious operations (landing forces by the navy), but establish a Forward Operation Base (FOB) directly on the ground behind the enemy lines and carry out ground offensives from there. The birth of the new strategic concept was facilitated by the introduction of the convertiplane (e.g. Bell-Boeing V22 Osprey) to the American military, which provides longer ranges behind enemy lines for Marine operations.[26]

2.3. Role of airborne capabilities in the Multi Domain Operation concept

The Multi-Domain Battle/Multi-Domain Operations (MDO) concept is the strategic concept of multi-dimensional operations, according to which several types of operations will be conducted simultaneously in the battle space of the future. Besides

21 Wass and Echevarria 2001, 5.
22 FM 100-5 1997, 191.
23 FM 100-5 1997, 191.
24 Grange et al. 2002.
25 Kiss 2015, 60.
26 Reed 2013.

conventional (air, ground and naval) operations, space warfare, information and cyber operations will also appear.[27] The new concept could have a significant impact on the theory of the mission and application of certain branches as well. One important aspect of the MDO concept is the emphasis on greater operational depth, which means an increase in the range of airborne operations.[28] The Future Vertical Lifting Capability referred to in the theory of Multi-Domain Operations also calls for the further development of longer maximum range convertiplanes and new types of high speed helicopters. The widespread application of new types of air transport vehicles, especially the convertiplanes, is justified by the demands and large proportion of special operations forces involved in multi domain operations. Special operations forces are airlifted behind enemy lines and they are equipped with light vehicles, such as quads, etc.

Summary and conclusions

Airborne operations made the vertical envelopment of enemy forces possible for ground troops in World War II, and they have also become an integral part of the strategic thinking of the great powers. Beginning in the 1960s, parachute operations were further expanded by helicopter-based airmobile operations. In the 1980s, as a result of the greater transport capacity of gas turbine powered transport aircraft, it became possible to airlift heavy military equipment, such as light tanks and self-propelled guns, and after the development of the parachute capabilities required, paratroops were augmented with heavy organizational elements such as armoured battalions. Since the 1980s, armoured combat vehicles have been widely used in the Soviet/Russian, German, British, and US military as well in both paratrooper and airmobile organizations. The above developments have increased the tactical capabilities of these organizations, brought about changes in their warfare tactics, and made their operations more mobile. The development of mechanized operational capabilities is described in Field Manual FM 100-5, with an emphasis on the principle that troops deployed behind enemy lines must maintain their mobility after landing.

Today, the airlanding of mechanized reinforcements in the follow-on echelon is an integral part of the tactics used by airborne organizations. During the 2003 Gulf War, a number of airborne operations were conducted in which paratroopers captured an airfield to which subsequently C-17s delivered armoured combat vehicles, for example M1 tanks. The combat vehicles of the airportable Stryker Brigade are transported and air landed by C-130 aircraft. This can only be executed by first taking control of an airfield through air assault operations.

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27 AJP-3.20 doctrine 2020. and TRADOC Pamphlet 525-3-1 *The U.S. Army in Multi-Domain Operations 2028 concept. The US ARMY Operating Concept "Win in a complex world"* 2020–2040. Downloaded: 2016. 10. 05.

28 TRADOC Pamphlet 525-3-1 The U.S. Army in Multi-Domain Operations 2028 concept. The US ARMY Operating Concept "Win in a complex world" 2020–2040. Downloaded: 2016. 10. 05. http://www.tradoc.army.mil/tpubs/pams/tp525-3-1.pdf 19.

Airborne operations played an important role in the development of the Air-Land Battle concept (1980-82), the Air-Sea Battle concept (2009), and the Multi Domain Operation concept (2018) as well. Air mechanization served as a catalyst for fundamental changes in airborne warfare tactics and resulted in an unprecedented increase in the mobility of airborne troops after landing. Due to the greater maximum range of convertiplanes, airborne units can now be employed in a number of new ways by both the Land Forces and the Marines.

Table 1.
The Role of Airborne Operations in Strategic thinking (1982–2018)

Name of strategic concept	*Validity*	*Key concepts*	*Role of airborne units*
Air-Land Battle	1982-2017	Long range manoeuvre, air force cooperation, airborne troops	Conduct long range operations with strong air support and provide support for armoured units
Air-Sea Battle	2009-2017	Air force cooperation, use of space devices	Marines establish a forward operational base on the ground, behind enemy lines
Multi Domain Operation	2018-	Greater operational range, special operations, digital soldier, space and cyber warfare, synergy between dimensions	Conduct long range airborne operations and increases the proportion of special operations based on future vertical lifting capabilities

Based on the present study of the development of airborne warfare tactics between 1935-2020, the following can be concluded:

1. The process which eventuated the integration of airborne operations into modern operational concepts has been analysed and the results are presented in *Table 1*;

2. The analysis also reveals that after 1935 new warfare tactics were gradually introduced, where mechanized airborne units conduct operations farther away from the drop zone;

3. A study of airborne tactics proves that the introduction of new military assets such as the helicopter, convertiplane, or the airborne tank has changed the warfare tactics of airborne organizations and resulted in an increase in the military capabilities of airborne troops.

BIBLIOGRAPHY

AJP-3.20 doctrine 2020. *Allied joint doctrine for cyberspace operations*. Zoltán Gulyás Brigadier General, HUNAF, Directcf NATO Standardization Office, Ministry of Defence.

ATP-33B 1997. *ATP-33 B NATO harcászati repülő doktrína*. Budapest: HVK, Euro-Atlanti Integrációs Munkacsoport.

Bagi József 2009. A BMD-4 deszantharcjármű. *Haditechnika* 43. (április): 4–12.

FM 100-5 1997. *Tábori kézikönyv: Hadműveletek*. Budapest: Magyar Honvédség Vezérkara.

FM 3-90 2001. *FM 3-90 Tactics, Headquarters Department of the Army*. Washington, DC: 4 Juli 2001 Appendix C: Airborne and Air Assault Operations.

FM 57-35 1973. *Tábori kézikönyv: Légimozgékony műveletek*. Budapest: MNVK 2. Csoportfőnökség.

FM 71-100-2 1993. *Light, Air Assault, and Airborne Infantry Division*. In FM 71-100-2 Infantry Division Operation, Chapter 1. US ARMY Field Manuals, Washington, DC: Headquarters Department of the Army, 31 August 1993.

FM 71-100-3 1996. *Air Assault Operations*. US ARMY Field Manuals, Washington, DC: Headquarters Department Of The Army, 29 October 1996.

FM 90-26 1990. *Airborne Operations.* Washington, DC: Headquarters Department of the Army.

Franz, Wallace P. 1992. "Air mechanization, the next generation." *Military Review*, 72. (2): 59–66.

Glantz, David M. 1984. *The Soviet Airborne Experience*. Fort Leavenworth: Combat Studies Institute.

https://doi.org/10.21236/ADA153124

Grange, David L., Wass, Huba, Liebert, Rich, Jarnot, Chuck, Huber, Al and Sparks, Mike 2002. *Air-Mech-Strike - Asymmetric Maneuver Warfare for the 21st Century*. Paducah: Turner Publishing Company.

Head, Daniel T. 1999. "The 2nd Parachute Battalion's War in the Falklands – Light Armour Made The Different in South Atlantic Deployment." *Armor* 108. (5): 9–12.

Jarnot, Charles A. 1996. *Air Mech XXI: New Revolution in Maneuver Warfare*. MMAS Thesis. Forth Leavenworth: U.S. Army Command and General Staff College.

Kiss Roland 2015. Air-Sea Battle – A globális közös terekhez való hozzáférés hadműveleti koncepciója. *Nemzet és Biztonság* 8. (4): 56–69.

Marek, Reinhard 1992. Ejtőernyős páncélelhárító zászlóalj. *Truppenpraxis*, 36. (6).

Mark J. Reardon and Jeffery A. Charlston: *From Transformation To Combat – The First Stryker Brigade at War.* Downloaded: 2021. 03. 11.

Mettler, Wofgang 1995. "The German Airborne Antitank Battalion and the Wiesel Armored Weapon Carrier." *Infantry* 85. (1): 24–29.

Owen, R. C. and Fogg, T. A. 2001. "Air Mobility Command and the Objective Force: A Case for Cooperativ Revolution." *Military Review* 2001. 1. sz.

Reardon, Mark J. and Charlston Jeffery A. 2007. *From Transformation To Combat - The First Stryker Brigade at War.* Washington, D.C.: Center of Military HistoryUnited States Army. Downloaded: 2021. 03. 11. https://history.army.mil/brochures/Stryker/Stryker.pdf

Reed, John 2013. "The future of amphibious warfare is airborne." *Foreign Policy* 26 March 2013. Downloaded: 2017. 11. 27. http://foreignpolicy.com/2013/03/26/the-future-of-amphibiouswarfare-is-airborne/

Richard E. Simpkin 1981. "An Airmechanized Force for the 90's." *Armor* 90. (4).

Roger Edwards 1974. *German Airborne Troops 1936-1945*. Garden City, Doubleday

Szilágyi Tibor 1998. *A sivatagi pajzs és a sivatagi vihar hadműveletek: logisztikai perspektíva.* Egyesült Államok Szárazföldi Haderőnemi Társaság.

TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028 concept. The US ARMY Operating Concept "Win in a complex world"* 2020–2040. Downloaded: 2016. 10. 05. http://www.tradoc.army.mil/tpubs/pams/tp525-3-1.pdf

Wass and Echevarria 2001. Huba Wass de Czege and Antullio J. Echevarria 2001. *Toward a Strategy of Positive Ends.* Forth Leaveworth: Strategic Studies Institute, US Army War Collage.

Wright, R. K. and Greenwood, J. T. 2007. *Airborne Forces at War*. Annapolis: Naval Institute Press.