Is Air Power essential to winning a Modern War?

An essay

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Fürstenfeldbruck, Germany

April 2013

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1. INTRODUCTION

1.1 Purpose and Significance

Ever since the establishment of military aviation air power has been an essential factor for world's armed forces in waging war. Nevertheless in the 21st century and the age of "modern wars" there are more and more voices aiming the incapability of todays' air forces in contributing big parts to modern warfare.

This essay shall examine the reasons for air power indeed being crucial to winning or rather accomplishing current and future missions.

1.2 Basic Assumption – What is Modern War?

In order to create a mutual basis referring to the definition of modern war, I'll briefly draw a picture of my own comprehension induced by my sources.

In fact, there are many different catchwords attempting to grasp what modern war really seems to be. For instance, "fourth generation warfare"[1], irregular, asymmetric or unconventional warfare as well as low intensity conflict and small wars are all describing the latest war scenarios.[2] But what types of conflict will we face in the future of modern wars? To answer this question I want to allude to Clausewitz saying that "*war is more than a true chameleon that slightly adapts its characteristics to the given case*".[3] Consequently, the concept of war itself can't really be grasped due to always changing its appearance and being amorphous.

Still there is a way to specify future war's appearance. When Clausewitz

[1] William S. Lind, "Understanding Fourth Generation War," January 2004 (http://www.antiwar.com/lind/?articleid=1702, accessed on March 17, 2013)

[2] **Refer to picture 1**

[3] Carl von Clausewitz, "On War," *Oxford World's Classics,* (http://wnlibrary.org/Portabel%20Documents/C/Clausewitz%20On%20War.pdf, accessed on March 17, 2013)

refers to adaption one can predict at least a few factors influencing the color of the chameleon. Without fail war will be waged in the entire range of conventional, unconventional and cyber warfare or even a mixture of these[4] where frontlines are likely to be blurred and where urban regions will be pushed along in the center of conflict.[5] Beyond this, warfare can't elude globalization which will lead to an increasing number of participants including those acting in the background. Generally speaking: "hybrid warfare"[6] is the basis for upcoming military developments concerning tactics and strategy which means that the color-changing chameleon will force us to deal with many different scenarios in the context of modern war.

2. REVIEW OF PAST WARS

2.1 Soviet Invasion in Afghanistan

When talking about today's wars, Afghanistan is the first one that comes to mind. Taking a look back 34 years ago, there was a fairly similar war fought between the Russians and the Mudjahideen that, in contrast to the US-led intervention, had a severe ending for both parties. Now by questioning the reasons for the Russians losing their war, one special incident in the sequence of events is striking. Of all the aid the Mudjahideen received regarding Operation Cyclone or the Bear Trap[7], the delivery of the Stinger missiles most significantly contributed to the Soviets losing their air superiority at least in great parts.[8] Thus they weren't able to deploy all their air capabilities as they were forced to operate in higher altitudes and still lost many aircraft.

[4] Positionspapier der Luftwaffe zur Air Surface Integration August 30, 2011
[5] John Mahaffey, "AWACS Rising – Joint C2ISR Force Multiplier for the 21st Century," JAPCC, *Journal Edition 15, 2012*
[6] Robert M. Gates, "A Balanced Strategy: Reprogramming the Pentagon for a New Age," *Foreign Affairs,* January 2009
[7] Mohammad Yousaf, "Afghanistan: The Bear Trap: The Defeat of a Superpower," *Casemate,* November 06, 2001
[8] John Cushman Jr., "THE WORLD: The Stinger Missile; HELPING TO CHANGE THE COURSE OF A WAR," *The NY Times,* January 17, 1988 (http://www.nytimes.com/1988/01/17/weekinreview/the-world-the-stinger-missile-helping-to-change-the-course-of-a-war.html, accessed March 17, 2013)

Additionally, air support shrunk dramatically causing even bigger problems for Russian "boots on the ground", hence adding a great part in Russian plans to withdraw.[9]

2.2 Operation Desert Storm

In contrast to this, one of the most polarizing successes of air power and the advantages emerging from constant air superiority is clearly represented by the First Gulf War, or rather Operation Desert Storm. It probably might be the best instance of air power providing the ground forces' freedom of movement and meanwhile devastating even the ghost of a chance for enemy forces to defend or repulse through dashing all their hopes with persistent strikes. Especially in the beginning of the conflict, these strikes made great effort in disabling Iraqi command and control as stealth aircraft were able to enter enemy territory very deeply almost ignoring enemy's air defence.[10] In this war the air strikes had one special feature: laser-guided smart bombs. With these PGMs another big achievement was made – the surgical warfare – itself lowering collateral damage to a minimum and raising the Suppression of Enemy Air Defences' effectiveness to a maximum.[11] To cut a long story short, coalition forces secured air superiority in the twinkling of an eye, in fact after one month, and generally never lost it through the Second Gulf War which finally led to winning both wars.

2.3 Appraisal of results

While the Soviet Invasion in Afghanistan and its failure at any rate partly caused by their loss of air supremacy and hence being an example for the consequences

[9] Dr. Robert F. Baumann, "Compound War Case Study: The Soviets in Afghanistan," (http://www.globalsecurity.org/military/library/report/2001/soviet-afghan_compound-warfare.htm, accessed March 17, 2013)
[10] Christian F. Anrig, "Luftmacht im Wandel: Optionen für die Schweiz," *Bulletin 2005 zur schweizerischen Sicherheitspolitik*
[11] Richard H. Shultz, Jr., Robert L. Pfaltzgraff, Jr., "The Future of Air Power in the Aftermath of the Gulf War," *International Security Studies Program, The Fletcher School of Law and Diplomacy, Tufts University,* 1992

evolving from a lack of air power[12] the great success of air power in the Gulf War lead to the so called and wide spread concept of Revolution in Military Affairs (RMA) meaning that air power will dominate the outcome of future wars. Indeed the efforts of the Air Forces were not only regarded by high-ranked Western military leaders, but also by Soviet ones such as Major General Vladimir Slipchenko, Chief Specialist of the Military and Strategic Research Centre of Russia's General Staff, saying that "*the Gulf War supports the fact that air strikes can, by themselves, form the basis for victory*" and that "*in [the] Operation Desert Storm, air power was responsible for victory because air superiority altered the complexion of the war from the very outset*."[13] Nonetheless, even in this positive statement the General at once curtailed the role of air power on forming only the basis for victory. So were there any reasonable assumptions that the praised RMA was overrated? Actually, this Gulf War was carried out under incomparably good conditions like James Corum already examined in his paper "*Air Power and Small Wars*".[14] Further, from today's view it seems to be clear that the RMA was overrated at least in some parts, but is too much criticism of the decisive role of air power in modern wars maintainable?

3. AIR POWER IN MODERN WARS

3.1 Air Power's Duties

"*The future battle on the ground will be preceded by battle in the air. This will determine which of the contestants has to suffer operational and tactical disadvantages*

[12] Air Chief Marshal Sir Stephen Dalton, "'Dominant Air Power in the Information Age' - The Comparative Advantage of Air and Space Power in Future Conflict," *IISS Address,* February 15, 2010
[13] Benjamin S. Lambeth, "THE ROLE OF AIR POWER GOING INTO THE 21ST CENTURY," *Chapter Six,* (http://www.rand.org/content/dam/rand/pubs/conf_proceedings/CF152/CF152.chap6.pdf, accessed March 18, 2013)
[14] James S. Corum, "Air Power and Small Wars: Current Operations," *Baltic Security and Defence Review, Volume 12, issue 1,* 2010

and be forced throughout the battle into adopting compromise solutions", this is what General Erwin Rommel predicted for the future, thus the time we're living in. So air power's first endeavor has to be to achieve and maintain control of the air and space in order to secure joint forces' comparative advantages first and foremost in our own skies of course. Otherwise, "*if we lose the war in the air*" according to Field Marshall Bernard Montgomery "*we lose the war and lose it quickly*".

Hence, if air supremacy is once achieved, air power's superior tasks lay in the range of supporting missions. Concerning this matter the shape of support can vary from humanitarian aid and transport duties to CAS or CSAR.

Well, which of these duties in reference to modern wars then is today's air power capable of to fulfill?

3.2 Air Power's Capabilities

First of all whilst elaborating about air power's capabilities one has to take account of the special characteristics that come along with the existence of modern aircraft. These characteristics are decisive ones in setting air power apart from the other services.[15]

Speed – allows air power to take the initiative and to provide a moment of surprise in which the attacking forces could severely harm their enemies .

Range – is the ability to reflect aerial force on even growing distances. The ability to conduct Air-to-Air Refueling is paramount for the increase of aircraft's ranges. Beyond that, 70 percent of the earth's surface may be covered by water and about 30 percent by land, however, air is pervasive. Consequently, for aircraft operating in just this element, air power can be displayed anywhere with quick reaction times

[15] Major Obst, GAF "Fähigkeitsprofil der Bundeswehr – Wirksamkeit im Einsatz," Luftwaffenlehre TeilII, November 01, 2011

thanks to land-based air power as well as the sea-based one.

Height – provides airmen great possibilities in accomplishing varying missions or in reacting to different situations due to the ability to move in a three-dimensional space where they for instance are able to remain undetected either in flying extremely low or in using stealth technology in higher altitudes.

Ubiquity – means even greater persistence as normal ranges of manned aircraft can even be outgunned by the deployment of UAV's which are rid of the limits of human's strain. This characteristic is essential to an effective use of intelligence CAP. **Agility** – in the age of multi-role fighter jets flexibility of air power reaches a level where the ability to react on nearly every kind of theatre rises to a maximum. **Concentration** – Timely arrivals and impacts of aircraft and their firepower in Centres of Gravity (CoG) are often decisive for mission success and therefore well enabled by speed, range, ubiquity and flexibility of aerial forces.

Precision – With further developed PGMs and the capability of Target Acquisition the precision of weapons in use rises reducing the risk of collateral damage which in turn justifies the use of air power even more.

Lethality – This characteristic goes along with an enhanced precision and concentration leading to fighters being more effective.[16] There is a close connection between Weapon Lethality and Target Survivability.[17]

3.2.1 Air Defence

Undoubtedly these characteristics are threatening to those who are confronted with enemies' air power. For the purpose of countering this threat NATO forces use Air Defence (AD) *"in order to assure an adequate national defense"* which makes it

[16] BRITISH AIR AND SPACE POWER DOCTRINE AP 3000 FOURTH EDITION, *Air Staff Ministry of Defence*
[17] Dr. Joel Williamsen, "Lessons Learned in Survivability and Lethality," *Institute for Defense Analyses*

"necessary — and sufficient — to be in a position in case of war to conquer the command of the air" like General Giulio Douhet[18] already remarked.

Regarding this goal of Defensive Counter Air (DCA) NATO released its structure of NATO Integrated Extended Air Defence to ensure unitary leadership and effective accomplishment of tasks.[19] The GAF's principle of SEE-DECIDE-ACT is a quite simply comprehensive theory of how such an integration can work.[20] In addition, Air-Surface-Integration affected warfare also offers Maritime AD systems supporting air forces primary task including the forward-looking challenge of realizing the NATO Ballistic Missile Defence.[21] [22]

In further illuminating the concern of counter-air, I will focus on Active AD for it being a crucial factor to avoid the use of own Passive AD. Therefore, starting with the first and perhaps most important duty of Active AD, Air-to-Air Combat or so called Air Combat Maneuvering (ACM), I can refer to Major Alexander P. de Seversky (USAAF) saying that *"only air power can defeat air power. The actual elimination or even stalemating of an attacking air force can be achieved only by a superior air force"*.[23] So as to be this superior air force in upcoming modern wars, NATO forces feature a few different fighter aircraft such as the Eurofighter Typhoon, Dassault Rafale, Saab JAS 39 Gripen, F-22 Raptor and in terms of future the F-35 Lightning II. For the reason of these weapon systems being incapable of working efficiently without command and control the NATO forces also possess C4ISR Systems like AWACS all in all enabling Allied Forces to conduct successful both Joint and Combined Operations due to the successful

[18] Giulio Douhet – Italian General and strategic airpower theorist (1869-1930)
[19] AJP-3.3 Joint Air and Space Operations Doctrine, *NATO,* 2002
[20] **Refer to picture 2**
[21] **Refer to picture 3**
[22] Major Diry, GAF "Fähigkeitsprofil der Bundeswehr – Wirksamkeit im Einsatz," *Luftwaffenlehre TeilII,* July 07, 2011
[23] http://www.afa.org/quotes/Quotes_81208.pdf, accessed, April 05, 2013

establishment of Tactical Data Links.[24]

Also connected and integrated with Tactical Data Links are modern Ground Based Air Defence Systems (GBAD) including Surface-To-Air Missiles and Anti-Aircraft-Artillery. Deputy systems in this range of weaponry are the FIM-92 Stinger, the MIM-104 Patriot PAC-3, the USAAF's Terminal High Altitude Area Defense (THAAD) and the upcoming Medium Extended Air Defense System (MEADS).[25] Especially these THAAD and MEADS systems provide an even topped GBAD.

3.2.2 Air Offence

Now, attaching Air Offence (AO) which according to General H. H. 'Hap' Arnold *"is the essence of air power"* Offensive Counter-Air (OCA) and Anti-Surface Force Air Operations (ASFAO) missions are the ones' to mention. Inasmuch the special characteristics of air power again advantaging the offensive force and for me currently examining this perspective, I will begin with the Suppression of Enemy Air Defences (SEAD) basically a self-defending mission of the attacking air force and so far the basis for further operations. These missions carried out by aircraft like the Panavia Tornado ECR or the EA-18G Growler armed with Anti-Radiation Missiles such as the AGM-88 HARM and ALARM are directed against GBAD aiming to reach freedom of movement for following aircraft and to take the first step towards air superiority.[26] The next capabilities of air power are the Fighter Sweep and Fighter Escort ones often used in joint air operations. While the Fighter Sweep is particularly targeting enemy fighter jets with ACM and preferably beyond visual range Fighter Escort aircraft serve to fulfill special missions of bombers or surveillance aircraft through defending them acknowledging that today's multirole-fighter jets are capable to defend themselves.

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[24] Air Force Doctrine Document 2-1.1 "Counterair Operations," *USAAF,* May 06, 1998
[25] GenLt Klaus-Peter Stieglitz, "Luftwaffe im 21. Jahrhundert – Perspektiven," *GAF,* September 10, 2009
[26] Tom Withington "The SAM busters," *Jane's Defence Weekly, Volume 47, Issue 1,* January 06, 2010

Finally, regarding OCA remaining capabilities are Airfield and C2 Attacks accomplishable by multirole-fighter jets or bombers for instance using Small Diameter Bombs. These attacks are crucial to OCA and therefore to achieve air superiority as they are about to destroy enemies' air power on the ground before entering combat exemplary conducted by the Israeli Air Force in the Six-Day War and the Royal Air Force in the Falklands War.

If OCA missions are successful and air superiority can be maintained ASFAO missions including the abilities to conduct both Air Interdiction (AI) and Close Air Support (CAS) will be the ones to set about. To take a closer look at them one will ascertain that good AI at last is the power that allows the "boots on the ground" their desired freedom of movement because AI tends to perish all the military potential from deployed troops to the whole chain of supply. For this purpose nearly the whole bunch of air assets could be used ranging from fixed-wing aircraft, U(C)AVs, attack helicopters to Surface-to-Surface Missiles.[27]

However, to put it bluntly probably the air offence capability seeming to arrest the most civil attention in todays' wars is CAS. CAS is the quick reflection of aircraft's firepower in contribution to the battle on the ground where especially the characteristics such as speed, ubiquity, concentration, precision and lethality claim a big share at the efficiency of these missions. Indeed this capability has been existing for a long time, still its' significance has steadily risen since the age of COIN-missions (OIF/OEF).

3.2.3 Air Powers Contributions to Information War

Yet the inevitable premise for conducting any kind of military missions AO, AD or even missions of ground or maritime forces is intelligence. Therefore, as Information

[27] AJP-3.3 Joint Air and Space Operations Doctrine, *NATO,* 2002

Warfare constantly gains in importance air forces use different forms of Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) as well as Electronic Warfare (EW) options to deal with this type of war.[28] Greater situational awareness and quick reaction capabilities evolve from the valuable characteristics of range, height and ubiquity which exceedingly distinguish deployed ISTAR or EW forces such as U(C)AVs, turboprops and multirole aircraft.[29] By taking a look at Afghanistan one will notice the severe importance of these capabilities as SIGINT and CREW depict measures of airborne CIED[30] which allow capable aircraft to deploy Electronic Counter Measures in order to minimize the ground forces' vulnerability.[31]

3.2.4 Air Support

Ultimately, *"the indirect application of air power, that is, the support role of aviation, often proves the most important contribution"*.[32] This role offers more non-kinetic effects implying conventional transport, as well as AirMedEvac and CSAR operations. Facing the significance of conventional transport examples are ranging from the Berlin Air Lift to todays' missions like Mali (Operation Serval) or even future wars waged with the upcoming A400M tactical airlifter[33] which had not been, aren't or won't be possible without the supporting task of conventional transport and logistics which in fact can be conducted by ground forces but only without the special characteristics air power offers.[34] In this context, one has to admit that especially speed and ubiquity lead to the successful establishment of AirMedEvac providing the best health care services to wounded "boots on the ground" proved by statistics of recent wars' ratio of casualties

[28] JAPCC, "AIR POWER IN COUNTERING IRREGULAR WARFARE," June 2008
[29] Garteth Jennings, "Proportionate Force," Jane's Defence Weekly, *Volume 47, Issue 9, March 03,* 2010
[30] Martin Streetly, "Counter-culture," Jane's Defence Weekly, *Volume 47, Issue 34, August 25,* 2010
[31] Air Force Doctrine Document 2-1.1 "Counterair Operations," *USAAF,* May 06, 1998
[32] Corum and Johnson, "Airpower in Small Wars," *University Press of Kansas,* June, 2003
[33] GenLt Klaus-Peter Stieglitz, "Luftwaffe im 21. Jahrhundert – Perspektiven," *GAF,* September 10, 2009
[34] Angelina M. Maguinness, "Counterinsurgency: Is "Air Control" the Answer?," *smallwarsjournal.com,* April 05, 2013

(OIF/OEF).[35] Beyond that, one special capability of air support concerning non-kinetic effects is striking. As many contra-air power theorists argue that the kinetic effects of air power could do more harm than good because of collateral damages and for instance former COM ISAF US-General Stanley McChrystal saying that *"air power contains the seeds of our own destruction if we do not use it responsibly"*[36] the execution of so called "Show of Force" missions enables air power to methods of psychological warfare: *"Air power was of great value. One night we were grabbing a suspect and the streets cleared as we were driving out, which meant something was about to happen. I had two fast jets fly low right down the street which created a tremendous noise, and we had no problems".*[37] So, referring to McChrystal's statement one can also say that "*air power contains the seeds of our own destruction if we do not use it"* anyway![38]

3.3 Importance of Air Supremacy

In conclusion, after inquiring air power's capabilities, the relevance of air supremacy should be more obvious as acknowledging the special tasks air forces are able to master gave a broad hint on the big part air power can contribute to the mission's success. Nevertheless in further discussing the importance of air power one can refer to Air Chief Marshal Sir Stephen Dalton, RAF Chief of the Air Staff, implying and Benjamin S. Lambeth[39] saying that control of the air is in the most cases an *"indispensable precondition for joint-force victory on the ground".*

[35] icasualties.org, accessed, April 05, 2013
[36] http://www.nytimes.com/2009/06/22/world/asia/22airstrikes.html, accessed April 05, 2013
[37] Major St. John Coughlan, (BRITISH AIR AND SPACE POWER DOCTRINE AP 3000 FOURTH EDITION), March 26, 2006
[38] **Refer to picture 4**
[39] Ibid.

CONCLUSION

Can Air Power alone win Wars?

Finally there is only one question left: Is air power able to win wars on its own? The answer is no, because it isn't supposed to and this won't ever be a military leaders intention in the era of joint and combined operations and in the end referring to Clausewitz saying that *"war is merely the continuation of policy by other means"* it is policy again deciding whether this continuation leads to success. Hence it's neither military nor one service deciding about winning or losing a war – it's always politics which judges about the start and the outcome of warfare – in history and in future.

Therefore, each service should *"develop with the other two members of the team in cooperation, not in competition"*[40], as all military members should rather be *"joint warrior first, and environmental specialist second"*.[41]

All in all and as a result of my essay I would say that air power definitely will be essential to winning modern wars in the recent age and upcoming ages of warfare. The boiling point is that none of the other services could ever reach the comparative advantages that evolve from air powers' unique capabilities.

"Without A&S Power, 500,000 to 600,000 troops would be needed in Afghanistan to achieve the same effects as the 40,000 soldiers, sailors, marines and airmen we have there today.[…] In short, there is no substitute for effective A&S Power."[42]

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[40] Arthur W. Tedder, "Air Power in War," *University of Alabama Press,* April 15, 2011
[41] JAPCC, "NATO's FUTURE JOINT AIR & SPACE POWER," April, 2008
[42] Lt. Gen. Karl Eikenberry, quoted in JAPCC, "NATO's FUTURE JOINT AIR & SPACE POWER," April, 2008

Annex 1: Pictures and Graphs

Picture 1

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Picture 2

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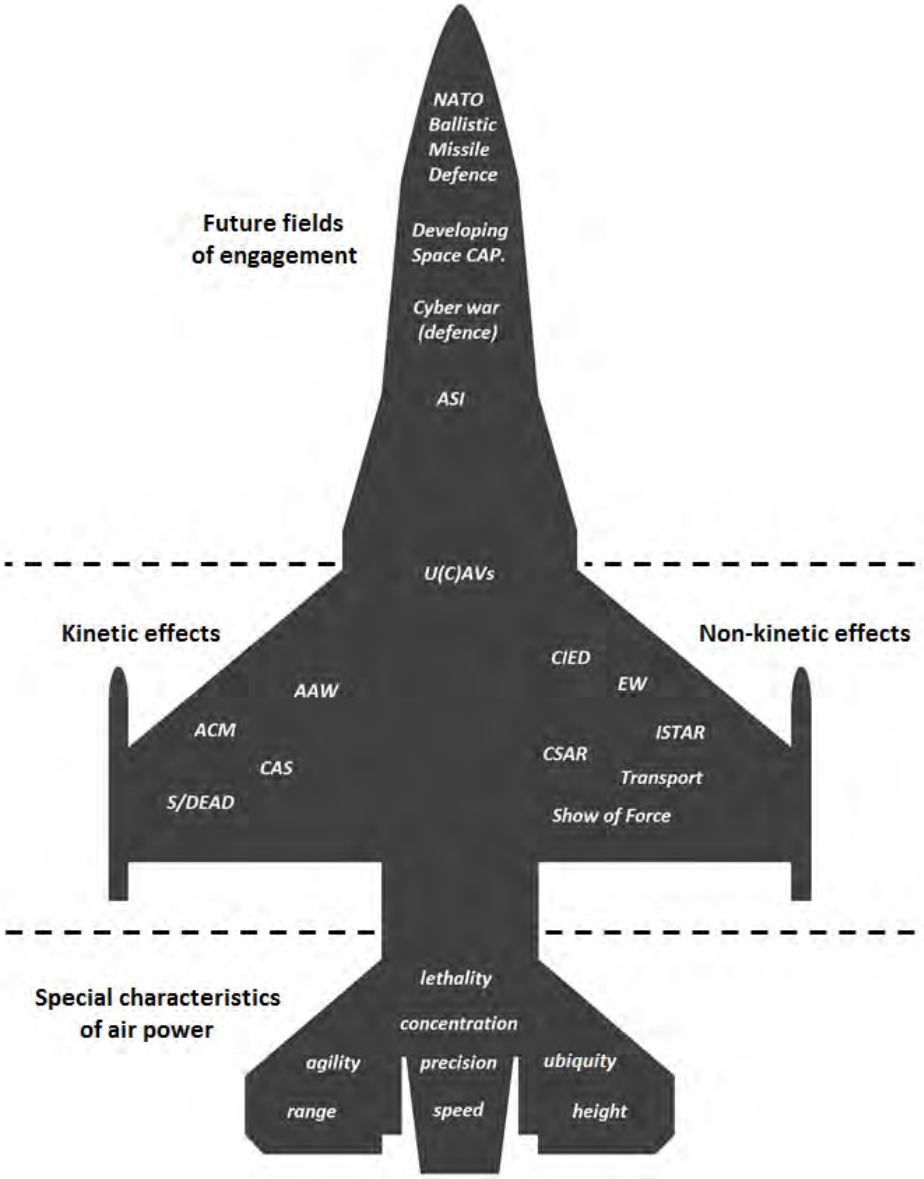
[43] Werner Theisen, "Luftwaffe der Zukunft: konzeptionelle Schwerpunktverlagerung," *Europäische Sicherheit: Politik, Streitkräfte, Wirtschaft, Technik,* 2010

[44] Brigadegeneral Dipl.-Kfm. Richard Martin Schelleis, "Unmanned Aircraft Systems / Remotely Piloted Aircraft in der Luftwaffe - Perspektiven 2025-2040,"

Picture 3



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[45] Airman Third Class Tobias Dobrowolski, GAF

Picture 4

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[46] Brigadegeneral Dipl.-Kfm. Richard Martin Schelleis, "Unmanned Aircraft Systems / Remotely Piloted Aircraft in der Luftwaffe - Perspektiven 2025-2040,"

Annex 2: Abbreviations and Acronyms

AAA	Anti-Aircraft Artillery
AAR	Air-to-Air Refueling
AAW	Anti-Air Warfare
ACM	Air Combat Maneuvering
AD	Air Defence
AI	Air Interdiction
AirMedEvac	Air Medical evacuation
AO	Air Offence
ARM	Anti-Radiation Missiles
ASFAO	Anti-Surface Force Air Operations
ASI	Air Surface Integration
AT	Air Transport
AWACS	Airborne Warning And Control System
BVR	Beyond Visual Range
C2	Command and Control
C4ISR	Command Control Communications Computers Intelligence Surveillance and Reconnaissance
CAS	Close Air Support
CIED	Counter Improvised Explosive Devices
CREW	Counter Radio-Controlled IED Electronic Warfare
CoG	Centre of Gravity
COIN	Counter-Insurgency
CSAR	Combat Search and Rescue
DCA	Defensive Counter-Air
ECM	Electronic Counter-Measures
EW	Electronic Warfare
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
IW	Information Warfare
NATINEADS	NATO Integrated Extended Air Defence System
OCA	Offensive Counter-Air
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
PGM	Precision Guided Munitions
RMA	Revolution in Military Affairs
SAM	Surface-to-Air Missile
S/DEAD	Suppression/Destruction of Enemy Air Defences
SDB	Small Diameter Bomb
SIGINT	Signals Intelligence
SSM	Surface-to-Surface Missiles
U(C)AV	Unmanned (Combat) Aerial Vehicle

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