

EXAMINING AIR POWER AS A COMPONENT OF STATE POWER

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Abstract: The article presents a model of air power and describes its major components. Based on a brief historical overview and assessment of current security and technological trends, the author concludes that airpower continues to be an important ingredient of military potential and state power – a conclusion that is just as valid for small countries, as it is for leading global powers.

Keywords: Security Policy Making, Air Doctrine, Combat Potential, Airpower Model.

Introduction

A fundamental task facing the political and military leaders in making security policy is to determine critical situations and design and implement effective solutions to deal with such situations. Nowadays, the development of a methodology to this end largely rests on model building and the widespread use of computers. However, any approach to the creation of such methodology faces the challenge of identifying the key problems of the day and determining their place in global processes. Today, a major expert task is to articulate a set of concepts and to apply adequate terminology in a rational and correct fashion: a process at the base of each problem solving exercise. Different methods can be applied to this end. One possibility is to see how problems are viewed in the business world and borrow existing concepts, adapting them to a degree that is adequate to the problems and requirements of the present day. Typical problems in this sense may be issues related to national security and state military might. These are large-scale issues which comprise quantitative and qualitative elements and are exceptionally hard to resolve. Similar issues of a mixed and indetermi-

nate character are among the fundamental ones of the present day, in our transition towards the information age.

Medium and large-scale problems are of particular interest to scientists and researchers. It can be claimed that air power and air potential are among these. Their solution calls for the creation of a hierarchical system of concepts the study of which is relevant not only now, but also in the foreseeable future.

The development of science and technology goes along with national and state potential, and contributes to its development. It is precisely this potential that defines a nation's place in the contemporary world and its ability to attain set political, economic, and military aims. This is particularly valid for the contemporary period when the leading nations, or the so called 'Great Powers,' are entering the new information age. However, regardless of the age which a particular nation occupies and in which it lives, the pace of its development is determined by its ability to marshal the potential at its disposal in the right direction. We may define the degree of realization of national potential for the attainment of set aims in politics, the economy, and in the strategic area as *national power*. Naturally, this degree has different levels. They determine national vitality, and a nation's ability to survive in difficult periods, and to continue towards prosperity.

Once we define national power as the degree of realization of national potential, we may view it as a result or end state of a process which takes place within a complex system (whether in the national state or within a coalition of states), functioning within a set environment with which it constantly interacts.

New realities impose a broader view on national power as a whole and over its composite parts and elements. The fact that it is the result of the workings of an open system, one of whose entry points is *air power*, is germane to its study. Once we have concluded that national power may be viewed as a system, it is then necessary to define the environment – that set of finite elements that have an impact on the system. Such elements, which are essential for its existence, are the sources, which create the end result or give rise to a final and manifest concept needing only definition. Basic source of national power is the nation state as a system. Conditionally, we may divide the sources of national power into tangible and intangible ones (refer to Figure 1). *Tangible* sources include geography, economic potential, infrastructure, technological development, human resources, the armed forces, etc. *Intangible* sources may include, *inter alia*, culture, ideology, national will and morale, the ability of government and its responsibility in governance, the skill of national diplomacy in attaining its aims, and significant past successes and failures of a political and military nature.¹

Depending on the objectives set by political and military leaders, national power may be military and non-military. This distinction derives from the sources of national

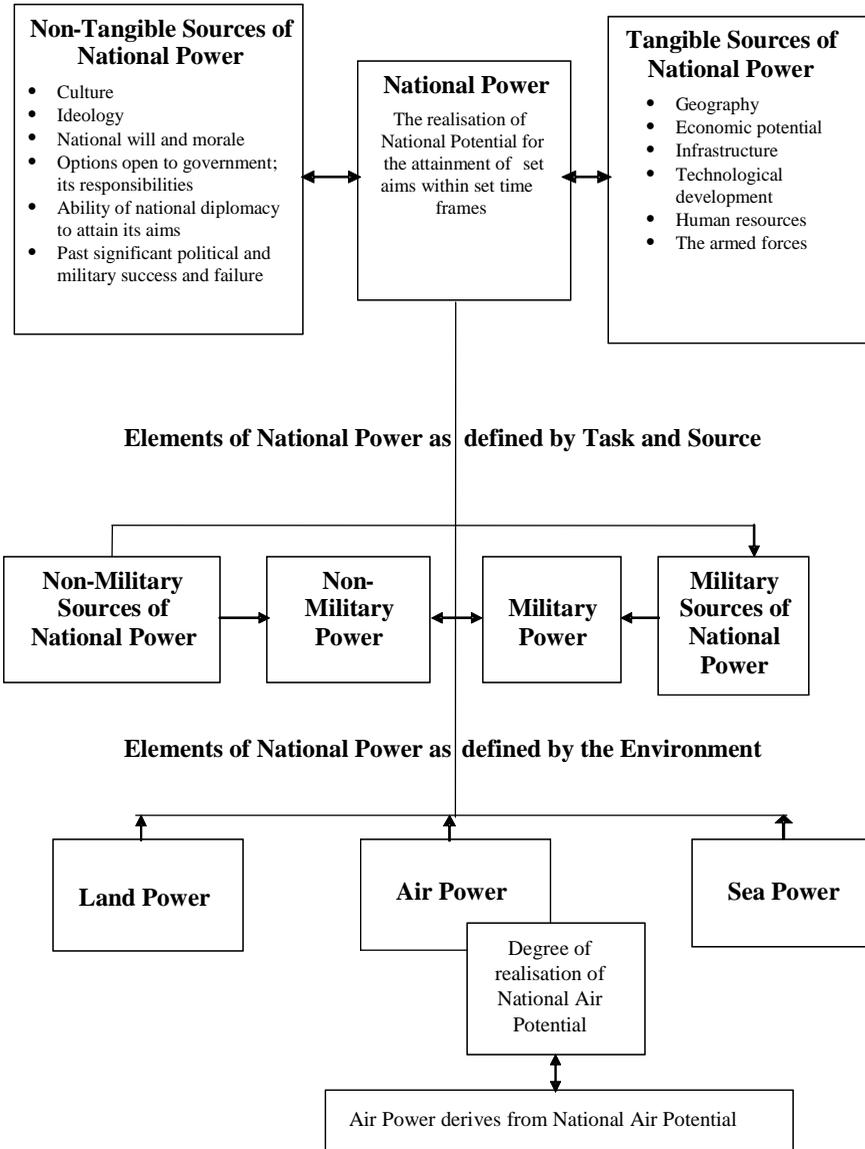


Figure 1: The Elements of National Power.

power and the logic of interaction between them. The conditionality in this case is deepened by the process of the most developed nations entering the information age, where the links within the system of national power under review are considerably stronger and where the boundaries between its individual parts are even harder to de-

termine. However, a distinction is still needed due to the fact that few nations have already reached such a stage of development. The strife of leading nations to retain a *status quo* that puts them in the position of world leaders able to shape the modern world according to their interest is natural. This is also a major reason for the emergence of sharp political and economic crises calling for frequent use of armed force for the enforcement of one or another decision.

Non-military power derives from non-military sources, which feed the part of the system linked mainly to the national political and economic potential. Military power derives from military sources. Both types of sources may be tangible or intangible and determine the methods and type of resource used to achieve set political goals on one hand and military ones, on the other.

In the context of the issue considered here, concepts of national and state military power are of particular interest. Military power is invariably part of national power and is expressed through the attainment of national aims or the defense of national interest by military means, which are also its basic source. State military power could be defined as the sum total of the action of all tangible and intangible sources of power within the state, or within a set class, or a coalition of states, which depending on the specific tasks ahead have to generate such power and mobilize available resources for the attainment of war aims or the resolution of matters other than war. Military power depends on the economic, social, scientific and technological, and morale and political means at disposal by the state. It is directly embodied in the state's armed forces and their ability to fulfill the tasks set by the political leadership. In turn, the armed forces are divided into Services, which depend mainly on the environment within which they are expected to act.² These are the Land Forces, the Air Forces, and the Navy. The ability of each Service to fulfill its narrow tasks depends upon its combat power. Combat power may be defined as that part of military power, which is generated by the action of a system of tangible and intangible sources that determine the state of the armed forces and their ability to fulfill combat tasks. It is realized through direct impact upon the adversary and is proportional to the number, morale, and training level of the force, the quantity and quality of combat equipment, and the ability of its C4I system. *Combat potential* is at the base of military power. It expresses the state and ability of forces and means directly involved in combat and directly engaged in the accomplishment of set combat tasks. The basic *components of combat power* are (see Figure 2):

- The forces and means directly participating in combat: personnel and equipment comprising basic combat potential;
- The forces and means supporting combat: special technical and logistics backup comprising the potential for combat support;

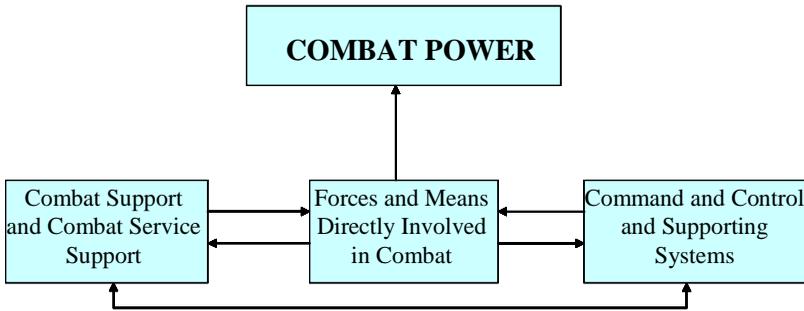


Figure 2: The Components of Combat Power

- The forces and means for command, comprising command and control potential.

Before embarking upon the definition of air power as a subsystem of national power as a whole, and of military power in particular, it is necessary to state that, depending on the environment, national power may be defined as the nation's potential to use land, sea and air in the realization of set goals related to its prosperity and existence.

Hitherto, *air power* theory has been exclusively developed by Western European and American theoreticians and experts. The attempts to formulate and explain air power date back to the infancy of aviation. Concepts related to naval power provided starting points. Early air power theoreticians borrowed ideas and postulates from naval warfare fairly uncritically. This worked only occasionally.

What is the nexus between naval power and air power? At the turn of the 20th Century, it was the striving to seek superiority or mastery in a largely uncontrollable environment. In addition, both naval and air power depended upon—and served—the needs of land operations. This gradually led to the triune configuration of national power, enabling nations to pursue objectives not only on land, but also on the seas, and in the air.

What were the properties of the new environment that challenged politicians and soldiers in search of superiority? The first and essential one is its universality. The earliest flying machines suggested to strategists that the new leap of human ingenuity had a future: with development, it would render any point on Earth accessible, moreover at a speed unknown to land and sea vehicles. Speed gave the new environment its second advantage: greater mobility, granting intrinsic privileges to owners of flying machines. The third advantage stems from the ability to move in three dimensions, thus gaining a large measure of invulnerability. Zeppelin's dirigibles and airplanes abruptly ended a British geographical immunity bestowed by 36 kilometers (21

miles) of Channel. This immunity had held well since the Norman Conquest in 1066, yet henceforth no nation was beyond invasion by air.

The first military leader, who not only saw the significance of nascent air power but also began active work to elevate it as a primary pillar of national power, was German General Staff Head, General-Feldmarschall von Moltke. Before the First World War, he formulated and applied a program for the promotion of this new weaponry and for the creation of properly functioning Army and Navy air units.³

In the Great War, Generals Trenchard and Billy Mitchell were the first to breach the Clausewitz postulates on warfare (which Foche followed). British soldiers had principal differences with Clausewitz's paradigms: they had attained and maintained a 150 year superiority not by setpiece wars but by maneuver, limited war, attrition and threat. Major General Trenchard and Brigadier Mitchell proved that rather than being tied to close support of the infantry, aerial forces ought to cooperate with them, and yet pursue independent objectives.⁴

Reviewing Tripolitanian, Balkan, and Great War experience, General Douhet attempted the first definition of air power in his 1921 book, *Command of the Air*.⁵ He and subsequent theorists regarded air power merely as a tool for mastery, even after the advent of missiles. For instance, writing in the August 1955, Major Alexander de Seversky defined air power as a function of speed, height, range, mobility and the ability to project armed power with pinpoint accuracy in time and place at maximum speed.⁶

To this very moment, theoreticians tend to regard air power as a component of national military power. In this sense, its definitions tend to recycle general concepts of armed power and combat potential. Treating the air force as a prime command, they address its armed power, combat potential, state, and ability to attain set objectives within a discrete timeframe.

Why is the topic of air power currently important?

- It has existed, exists, and will exist in the future;
- It has always presented planners with a broad range of options, does so now, and will continue to do so in the future;
- It calls for significant capital investment involving high levels of risk;
- It is highly dependent on national scientific and technological potential;
- It is an exceptionally convoluted and complex matter where rigorous decision making and implementation require a whole range of disparate resources;
- It is central to national security.

The methodology for addressing similar issues does not call for a precise definition of success.⁷ (Some system analysis communities even claim that such problems do not repay any over-detailed preparatory formulation.) However, national security matters such as air power and its role in armed conflict are overridingly important. Therefore, it is important prior to studying air power to define it (and options for its development) with the greatest possible precision. Efforts to formulate air power and imbue the concept with content date back to its very emergence.

To this day, as has been already mentioned, air power has been viewed in most cases as part of national military power. In this sense, to a certain extent, it coincides with the concepts of military power and combat potential, in this particular case dealing with combat power and combat potential specific to the air force as a major service and with its state and ability to fulfill set tasks and obtain set results. There is ground to believe that the result of the action of the means for overall use of airspace, including those for defending national interests, within a set period and using the environment and those means rationally do indeed comprise state air power. This power is determined by the nation's ability to utilize the military and economic potential of the airspace towards its goals. In this sense, air power may also be defined as the degree to which national air potential is harnessed, and more precisely the degree to which the elements of national air potential are harnessed.

Air power may reasonably well be regarded as a consequence of the functioning of a system composed of intertwined and interdependent components and elements. They all exist in a unity with the environment of the air. It is in this environment where the system exists as an integral whole.

The significance of the individual components does not depend on specific historical circumstances. Rather, the content of the system depends largely upon current and future circumstances. Considering the main objectives set here, reviewing the military aspects of air power is particularly important, bearing in mind the significance of air forces in current and future military conflicts.

The structure of the system that generates air power is clearly hierarchical. It includes *basic components* directly linked to the fulfillment of set economic or military tasks and *elements*, which, to one degree or another, influence these tasks. The number of components and elements in the proposed system vary. Their amount and degree of development depend on a number of factors and have a purely national character. Such factors could be the degree of economic development, the priorities the nation has set, guiding principles in its national defense doctrine, the political environment, and geography among others. Thus, most nations maintain three-service armed forces while just four (Saudi Arabia, Israel, Russia, and Vietnam) have four services with air defense in the role of the fourth service. Nevertheless, the principles of defining the

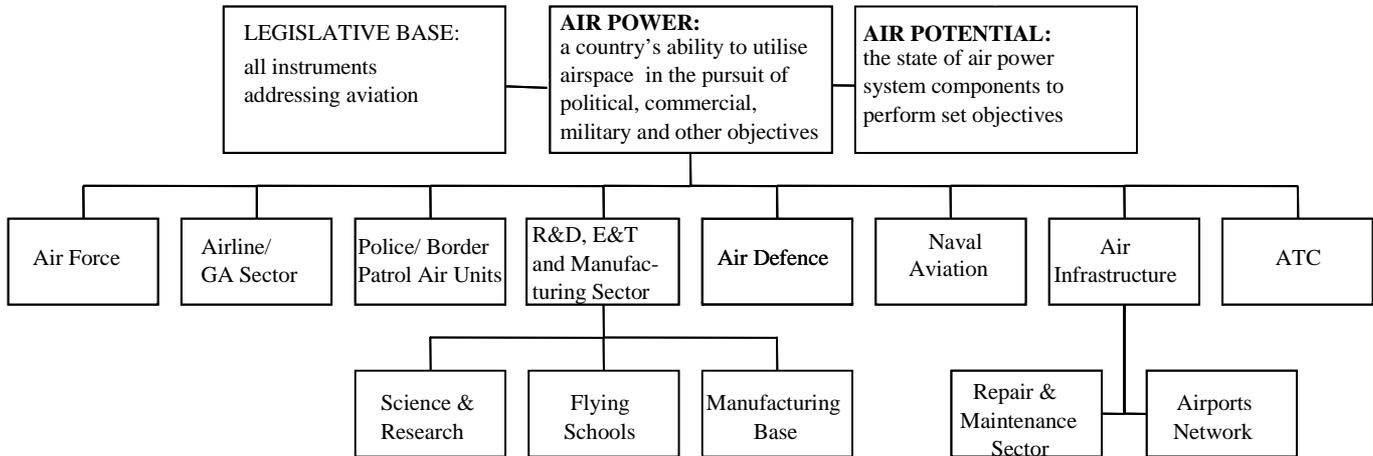


Figure 3: The Major Components of Air Power.

basic components are valid for the air power of any nation, which possesses aircraft and conditions for their use.

The following basic components of the air power generation system could be listed (see Figure 3):

- The nation's air force (including air defense forces, except the four aforementioned nations, where air defense forces are viewed as a separate component);
- State-owned and private airlines and aviation companies;
- The navy's aviation;
- Aviation arms of the police and the border police;
- State-run and volunteer aero clubs and defense support organizations;
- Air traffic control systems;
- The entire infrastructure supporting regular/normal flying;
- Research, education and training, and production facilities.

Sound air legislation is particularly important for the system's normal functioning. This cannot be counted as a component, yet directly influences the nature of processes at hand and the manner in which tasks are performed, particularly in peacetime. Each of the above mentioned major components may be regarded as a subsystem of elements. Thus, air forces represent a service within the armed forces. One of their elements, aviation, may also be viewed as a subsystem, which is composed of various types of aviation services. However, over-detailing of the system is not the aim here, since any over-complication would obscure the tasks set in the introduction.

Some of the elements in the structure of components that generate air power play special role in shaping and pacing its development. This explains why the author believes that the structure of these components deserves particular attention and their composition can be used as an entry point to the system of air power. Under consideration are two components: the entire infrastructure specialized in support to normal flying and research, education and training, and production facilities. The former essentially includes maintenance facilities and the network of airports. The latter component essentially consists of three elements: a developed research base; an aircraft manufacturing base, design facilities and teams of designers; and a system of schools devoted to training air personnel. Despite the fact that these elements are described in general terms as parts of two components and that in most countries their presence may be symbolic or altogether lacking, their significance in the development of aeronautics and aviation is enormous.

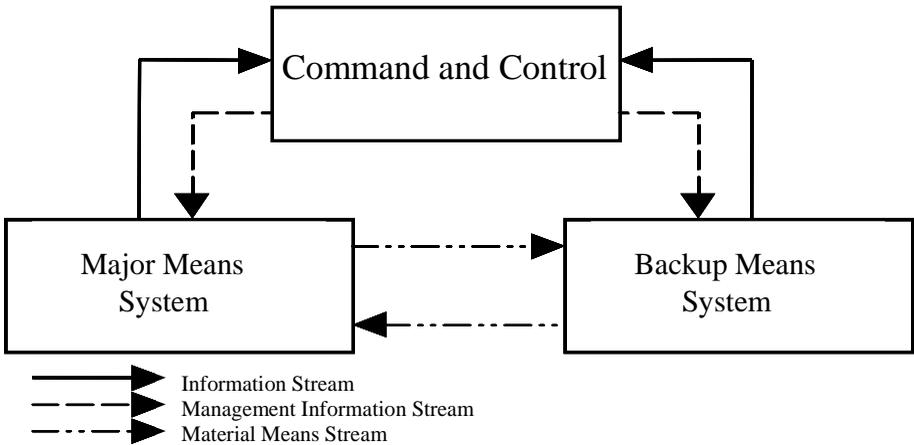


Figure 4: Basic Systems of Air Power.

In turn, these components may be subdivided into three basic subsystems (Figure 4):

- The major means subsystem comprising components directly involved in performing set tasks using aircraft;
- The backup means subsystem comprising all components, which ensure normal flying;
- The command and control subsystem comprising components involved in command activities.

Such a distinction is necessary in order to facilitate the creation of a method for quantifying air power – the practical purpose and meaning of the system proposed in Figure 3. National air potential forms the basis of air power. It determines the quality of the system. Air potential expresses the state and capabilities of air power components or those of the forces and means directly participating in meeting set tasks. It is not always necessary for the state to exercise its full potential. The extent of its application depends on many factors, foremost among them being the nature of the task in hand.

Air potential may be viewed as a source, which feeds the system that generates air power, or else as a system composed of several basic elements which determine it (Figure 5). They are grouped on the basis of possible modernization of components and essential elements in the system which generates air power. They might be viewed as the entry point to the system of air potential, whose exit point is the degree of its relevance as the ultimate assessment indicator of the state of the components of air power. The following elements of air potential could be outlined:

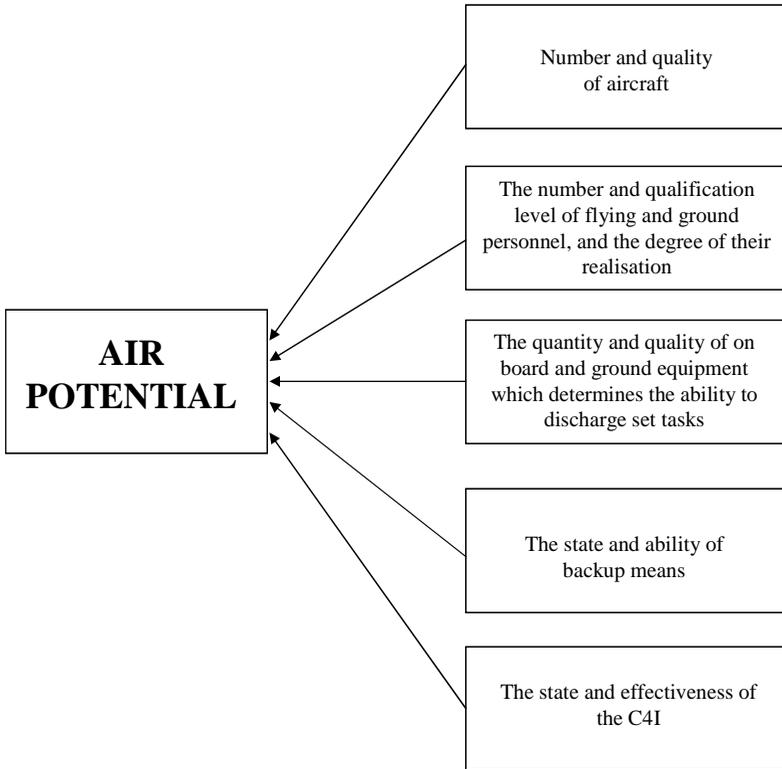


Figure 5: The Elements of Air Potential.

- The number and quality of aircraft;
- The number and qualification level of flying and ground personnel, and the degree of their realization;
- The quantity and quality of on-board and ground equipment, which determines the ability to perform set tasks;
- The state and capabilities of supporting means;
- The state and effectiveness of the command system.

The degree of relevance of air potential over a set time frame also determines the degree of air power. This is conditional, depending upon the actualization of the ele-

ments of air potential. Cases are known in practice where for one reason or another one or more components generating air power or elements of air potential have been missing or have been underdeveloped. Yet this did not mean that air power has been absent or that a certain part of its potential has become irrelevant. Naturally, it has to be clear that in such cases the level of air power at disposal of a nation and a state is seriously degraded. Apart from its own real capabilities, it is also subject to decision by the political or military leadership on the functions it assigns to air power in the overall system of military or national power.

It is clear that the proposed system for generating air power is part of the system generating military and national power. Its results may be measured by the degree of relevance of the air potential to the tasks assigned. Broadly, these tasks may be performed in peacetime, during crises, and in wartime. Despite the fact that the set of peacetime tasks that could be performed by the system of components which generates air power is very big, it is well possible to classify them as follows:

- Dissuading potential aggressors;
- Providing aid in time of disasters and crises;
- Helping realize all national and state priorities in economy, science and research;
- Patrolling and controlling national airspace;
- Maintaining a constant level of training and readiness for possible transition from peacetime to war.

The role of the Air Force in peacetime as a component of the system that generates air power is specific. As an armed service, the Air Force is able to demonstrate visible and tangible potential and readiness for its use. Political leaderships often apply such approach in order to dissuade and deter potential adversaries. Demonstrative actions in many cases allow to attain political aims without recourse to arms: merely through the effect of potential power or superiority, or demonstrating the threat of an armed clash.

Thus, the presence of air potential is always an instrument of national policy, and a reliable backup to peacetime diplomacy. This is helped by the very nature of the air force and its inherent properties: the constant high state of combat readiness; mobility and the ability to concentrate forces within the chosen theater of action rapidly. In this sense, the lack of and adequate level of air potential of Bulgaria, and the current process of minimizing the potential of components within the system, which generates air power, deprives the political elite from positions on the international arena. This is especially true today, when this system can play a decisive role in crisis management by performing basic tasks linked to:

- Measures for each phase of crisis escalation;
- Finding and destroying the likely enemy's diversionary and reconnaissance units, including terrorist groups;
- Participating in special operations (aerial reconnaissance, transferring special operations units, etc.).

At the same time, air power along with the other elements of national power increases the nation's ability to resist possible armed attack in a significantly faster and more adequate manner. Thus, it attains ever-greater significance in national security as the degree of armed threat rises. The material manifestation of this aspect of air power is characterized by the genuine ability of the state and nation to rebuff aggression, which must not be taken to mean that air power depends solely upon the combat power of the air force. Above all, air power must be interpreted as the ability of the state to utilize all resources and possibilities at its disposal in the use of airspace, including its use for the purposes of defense. Seen from this angle, the concept of air power may to some extent be defined as a basic indicator of national economic power, since it is an ever-present part of it. In today's conditions, economic power predetermines the levels both of military power, and of air power as an element of the former, and thus has both an economic and a military aspect.

The circumstances, which make us include military aspects into the concept of state air power, are mostly of an international character. Precisely these circumstances form the degree of threat to the state and beget the need for defense. In this sense, in military conflict of varying degrees of intensity and scale, air power expresses itself in the ability to:

- Control airspace over the home territory;
- Secure the actions of other components of military power;
- Control enemy airspace;
- Conduct constant surveillance (aerial, signals and radar) and gather information on the enemy using the advantages of the third dimension;
- Conduct transport operations.

The relative importance of army, air force, and navy has always depended on political and strategic factors, geography, international alliances, etc. The army has played first fiddle in some periods; in others, primacy has rested with the air force or navy. The place and role of each service in peace and war depends on the technical level of adversaries, their potential, and their geography.

Experience shows that each of the services makes a definite and always significant contribution to victory. Over the last century (since the arrival of air power) there

have been no pure infantry, naval or air wars; neither do military experts foresee any in future. One thing remains unaltered: only the army can secure the results of a campaign or a war. Its sheer physical presence on the ground consolidates the conquests of hot conflict.

Conditions for attaining the objectives arise only if organized, well-armed and well-trained armed forces are available. Each service has a specific purpose and modes of interplay with the others. Appropriate utilization of this specificity determines the success of an operation, campaign, or war. Thus, the pursuit of balance between the services (and within each of them) is a major issue in modern military science. National interests guide this search closely as do, *inter alia*, tasks set by political and military leaders, developments in the region and beyond, national potential, and geography. Finding this balance is also the key to another challenge: striking a balance between the components of air power.

Those who devise air power must carefully blend its components in the most advantageous way, and must maintain this blend thereafter. This is only possible after thorough scientific analysis of all influences on civil and military aviation. Balancing thus involves military science and addresses historical and technical developments. The issue of balancing invites examination of historical and military science aspects.

Military doctrine, national security postulates, and national constitutions have to provide for balanced development of air power. They must determine the role and place of air power and the air force within the hierarchy of national power, and national armed power. They must fix its relative weight in the system, its tasks in peace and war, and the composition and purpose of various force commands and civic volunteer formations.

In view of the basic requirements to air power (to perform tasks using its peacetime strength while taking account of geography, and to maneuver using available resources), another major procedure is to determine human and material strength. Here, planners must bear in mind that force renewal in today's swift wars is highly problematic, and generally considered impractical. Thus, balancing and creating air power is mainly a matter of peacetime planning.

Balancing the components of air power is an ongoing process. It evolves according to historical circumstances. Major factors determining such evolution include politics (changing balances, military blocs, and changes of régime), economic realities and changes in national economic and military potential, developments in indigenous and world science, and changes in the tasks assigned to air power. Tasks set by politicians and the level of national economic development are prime among these factors.

The study leads to these conclusions:

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- Air power is among the major indicators of national economic and military prowess. It expresses a country's genuine ability to utilize the air in the pursuit of its interests. Thus, it is undoubtedly a primary element of the national security system, and a measure of national prosperity and potency.
 - *The benefits of possessing air power* and air potential stem from the air as an environment (high speed, long range, three dimensional maneuverability), and from the promise of further development as science progresses. The air allows high mobility, flexibility and universality, and offers politicians and military leaders rapid and effective solutions to complex problems. This ranks air power as a prime element of national power. The primacy of air power and its growing importance define it as an issue that would repay its study as a system.
 - *The number of components* and the degree of their development express priorities and objectives nations set themselves. They are explicit in national security doctrines and implicit in geography, and the state of tangible and intangible sources of national power. This state varies with time. It also relates to links between system components. In this sense, air power is a complex open system whose entry point features components and subsystems, and whose major source is air potential.
 - *Air power has a multi-role nature* in both peace and war. Each of its tasks draws on a different set of components, thus calling for proper balance. Such balance can be determined using set principles and criteria. Experience shows that imbalance in constructing and developing components results in limited ability to perform tasks, and degraded ability to tackle subsidiary tasks. In this sense balancing components, and refining them to maintain this balance, is a challenge to national business, intellectual, and political leaders.
 - *The utilization of air power* depends on the proper interaction of heterogeneous components. Thus, utilizing air power does not imply merely summing these components' potentials, but rather invoking an altogether higher unity and potency. Attaining proper balance in the structure of air power depends to a decisive degree on complex scientific management during its construction and maintenance. This in turn may call for adequate funding. Obtaining it ought not to be a problem, since air power is always a matter of adequate sufficiency in a national context.
 - *Armed conflicts are direct stimulus* for the development of air power and air potential. They have played a unremitting shaping role ever since air power's emergence. Experience from assigning roles to air power's components can read across to military science, and to the formulation of national priorities as

a whole. Armed conflict is an extreme state that most rapidly tests the veracity of peacetime assumptions. What is necessary is a thorough study of the influence of air power on the course and outcome of armed conflict (particularly of air power's major wartime component, the air force). Because of their properties, air forces also manifest themselves as prime instruments of national policy in a variety of circumstances.

Notes:

- ¹ Air Force Basic Aerospace Doctrine of the USAF, Department of Air Force. Headquarters USAF, March 1992.
- ² Robert Frank Futrel, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, 1961-1984* (Maxwell Air Force Base, Alabama: Air University Press, 1989), 803 p.
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- ⁷ USSR Academy of Sciences, *Systems Research* (Moscow: Nauka, 1977) (in Russian).

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