

# 航空 航天

## CHINA AEROSPACE STUDIES INSTITUTE

### Overview of the PLA Air Force's Kongtian Yiti Strategy



Kenneth Allen

Printed in the United States of America  
by the China Aerospace Studies Institute

To request additional copies, please direct inquiries to  
Director, China Aerospace Studies Institute,  
Air University, 55 Lemay Plaza, Montgomery, AL 36112

All photos licensed under the Creative Commons Attribution-Share Alike 4.0 International license,  
or under the Fair Use Doctrine under Section 107 of the Copyright Act for nonprofit educational  
and noncommercial use.

E-mail: Director@CASI-Research.ORG

Web: <http://www.airuniversity.af.mil/CASI>

[https://twitter.com/CASI\\_Research](https://twitter.com/CASI_Research) @CASI\_Research

<https://www.facebook.com/CASI.Research.Org>

<https://www.linkedin.com/company/11049011>

## Disclaimer

The views expressed in this academic research paper are those of the authors and do not necessarily reflect the official policy or position of the U.S. Government or the Department of Defense. In accordance with Air Force Instruction 51-303, *Intellectual Property, Patents, Patent Related Matters, Trademarks and Copyrights*; this work is the property of the US Government.

## Limited Print and Electronic Distribution Rights

Reproduction and printing is subject to the Copyright Act of 1976 and applicable treaties of the United States. This document and trademark(s) contained herein are protected by law. This publication is provided for noncommercial use only. Unauthorized posting of this publication online is prohibited. Permission is given to duplicate this document for personal, academic, or governmental use only, as long as it is unaltered and complete however, it is requested that reproductions credit the author and China Aerospace Studies Institute (CASI). Permission is required from the China Aerospace Studies Institute to reproduce, or reuse in another form, any of its research documents for commercial use. For information on reprint and linking permissions, please contact the China Aerospace Studies Institute.

# China Aerospace Studies Institute

CASI's mission is to advance understanding of the capabilities, development, operating concepts, strategy, doctrine, personnel, organization, and limitations of China's aerospace forces, which include: the PLA Air Force (PLAAF); PLA Naval Aviation (PLAN Aviation); PLA Rocket Force (PLARF); PLA Army (PLAA) Aviation; the PLA Strategic Support Force (PLASSF), primarily space and cyber; and the civilian and commercial infrastructure that supports the above.

CASI supports the Secretary, Chief of Staff, and other senior leaders of the U.S. Air Force. CASI provides expert research and analysis supporting decision and policy makers in the Department of Defense and across the U.S. government. CASI can support the full range of units and organizations across the USAF and the DoD. CASI accomplishes its mission through conducting the following activities:

- CASI primarily conducts open-source native-language research supporting its five main topic areas.
- CASI conducts conferences, workshops, roundtables, subject matter expert panels, and senior leader discussions to further its mission. CASI personnel attend such events, government, academic, and public, in support of its research and outreach efforts.
- CASI publishes research findings and papers, journal articles, monographs, and edited volumes for both public and government-only distribution as appropriate.
- CASI establishes and maintains institutional relationships with organizations and institutions in the PLA, the PRC writ large, and with partners and allies involved in the region.
- CASI maintains the ability to support senior leaders and policy decision makers across the full spectrum of topics and projects at all levels, related to Chinese aerospace.

CASI supports the U.S. Defense Department and the China research community writ-large by providing high quality, unclassified research on Chinese aerospace developments in the context of U.S. strategic imperatives in the Asia-Pacific region. Primarily focused on China's Military Air, Space, and Missile Forces, CASI capitalizes on publicly available native language resources to gain insights as to how the Chinese speak to and among one another on these topics.

## Introduction

This paper examines the “integrated air and space capability”<sup>1</sup> (*kongtian yiti* / 空天一体) component of the People’s Liberation Army (PLA) Air Force’s (PLAAF) first ever service strategy, which was implemented to coincide with the PLAAF’s 10<sup>th</sup> Party Congress in May 2004 and represented a major milestone in China’s efforts to build a “Strategic Air Force.”<sup>2</sup> Although the strategy has a second component – “coordinating offensive and defensive operations”<sup>3</sup> (攻防兼备) – the paper will not discuss this in any detail. The PLAAF often combines the two components together in the phrases “building a strong air force based on integrating air and space capabilities, and coordinating offensive and defensive operations” (建设一支空天一体,攻防兼备的强大人民空军) and “creating a modern air force with integrated air and space capabilities and coordinate offensive and defensive operations” (空天一体,攻防兼备的现代化空军). It also uses “to change from an aviation-type [air force] to an air and space-type [air force]” (航空型向空天一体型转变). However, there is normally very little substance in the articles concerning what this means.<sup>4</sup>

In May 2004, the Chinese Communist Party’s (CCP) Military Commission (aka Central Military Commission / CMC) implemented the strategy as one component of the reforms to the PLA’s “Military Strategic Guidelines” (军事战略方针)<sup>5</sup> that were first implemented in 1956 and is linked to the PLA’s “active defense” (积极防御) strategy that dates back to the 1930s.<sup>6</sup>

## Key Findings

Although the PLAAF received its first ever strategy, identified as “integrated air and space capabilities and coordinated offensive and defensive operations,” in 2004, it is not exactly clear what “integrated air and space capabilities” really means. The bottom line is that, as part of the goal of creating a “strategic air force”, the PLAAF may have initially wanted to “manage” all of the PLA’s space assets, including education and training, personnel, organizations, and equipment, that did not happen. Instead, the newly created PLA Strategic Support Force (PLASSF) now manages all space assets previously managed by the former General Armament Department (GAD), while the PLAAF is able to use information gathered from space assets, such as intelligence information, to help make tactical decisions, and to be able to use space assets as communications relays between ground assets, such as command posts and command vehicles, and aircraft pilots, surface-to-air missile operators, and radar sites.

## The PLAAF's Search for Its Own Strategy

It is important to note that, in 1987, the PLAAF first proposed creating its own strategy with the goal of making “coordinating offensive and defensive operations” as its strategic component of the PLA’s “active defense” strategy, but it took almost 20 years of debate within the PLA before a service strategy was finally approved. One reason the PLAAF began advocating for its own strategy is because the PLA Navy was given its first strategy – offshore defense (近海防御) — in 1985. According to *Science of Air Force Strategy*, the ground force-dominated Academy of Military Science (AMS) and four General Departments put forward the following arguments countering the alleged need for the PLAAF to have its own strategy:<sup>7</sup>

- China can have only one national military strategy, and that is “active defense”.
- The PLAAF does not have strategic weapons, so it is not qualified to have an Air Force strategy.
- The PLAAF already has half of an Air Force strategy in that it has the strategic mission of air defense of the nation, but supporting the ground forces does not qualify as a strategic mission.
- Because the PLAAF’s command personnel can only implement directive guidance from above, lacking command and decision authority does not allow the PLAAF to have its own strategy.
- The PLAAF is a multifaceted service with many missions; therefore, it already has a strategy.

Throughout the late 1990s and early 2000s, the PLAAF was still searching for its own strategy. An article in the March 2000 issue of *China Air Force* magazine, for example, stated, “If the PLAAF is to have direction in the future, it must have the means to accomplish it as well. This means having its own strategic theory. Only in this way can each branch and each department become unified and take the form of a joint force.”<sup>8</sup> The article further noted, “It is heartening that concepts for the PLAAF’s strategic theory are now receiving high-level attention, and the air force’s training system will change appreciably as a result.” The article did not clarify, however, exactly what high-level attention it was receiving or what the results were.

One argument in the debate noted above about what constitutes a strategy is the requirement to have command authority. In discussions by the author of this report with PLA officers in 2002, it was suggested that the PLAAF had sought to become the lead element in a national air-defense organization as one means of acquiring command authority.<sup>9</sup> Specifically, in 1997, the National People’s Congress enacted “The People’s Air Defense Law,” which was the first law passed to guide and regulate the country’s air defense work. The law was implemented to provide detailed regulations for the construction of the country’s air-defense system, including air defense facilities in key points, the establishment of departments in charge of air defense as determined by the State Council and the CMC, civil air defense works, communications and alert system, evacuation procedures, mass air defense organization, civil air defense education, legal liability for failing to conform with requirements, and supplementary provisions. At that time, the State Council and the CMC were in charge of establishing the administrative departments that dealt with the people’s air defense. The urban governments were in charge of implementing the law for key protection points. The law stipulated a focus on “protection for key points,” primarily on cities. Interestingly, the law did not mention what forces (e.g., ground, naval, air, civilian air-defense force) would be employed. By leading such an organization, the PLAAF believed it would

attain sufficient status for leading a campaign, which would in turn allow it to establish an air force component of the strategic guidelines. However, the PLAAF was not given the overall authority for this mission, so it did not result in receiving its own strategy.

Another possibility for receiving its own strategy was that the PLA would assume a more offensive stance, even as it remained committed to providing air defense. In 2001, the PLA AMS published *Science of Strategy* (战略学), which stated, “Under the unified guidance of the active defense military strategy of our country, the air force needs to establish (有必要确立) its strategy as ‘offensive air defense’ (攻势防空).”<sup>10</sup> Unfortunately, the book did not explain what this meant, how it differed from the previous strategy, or how it would be accomplished. As such, it did not lead to the PLAAF receiving its own strategy for three more years.

### **Understanding The New Strategy**

Based on PLAAF writings in the early 2000s, it was clear that, based on the “integrated air and space capability” component of the PLAAF’s 2004 strategy, the PLAAF wanted to help manage parts of the PLA’s space program, but it did not want to manage the launch facilities, flight control centers, and personnel education and manning, which, at that time, were managed by the GAD. In March 2004, just two months before the CMC announced approval of the new strategy, two PLAAF authors under the guidance of an oversight committee at the Air Force Engineering University published *Air and Space Battlefield and China’s Air Force*. In August 2006, the same authors published a follow-on book, *The Science of Integrated Air and Space Operations*, with separate forewords by then-PLAAF commander Qiao Qingchen and political commissar Deng Changyou.<sup>11</sup> Both books were published by PLA Press as part of the National Social Science Foundation’s “Tenth 5-Year Plan,” which indicates they were authoritative publications. Although this component was approved in 2004, it was not mentioned in the *Defense White Paper* until 2015 and again in 2019.<sup>12</sup>

Another important milestone in 2004 was the elevation of the 9<sup>th</sup> PLAAF commander, Qiao Qingchen, along with the commanders of the PLA Navy and PLA Second Artillery Force as CMC members.<sup>13</sup> This was an important development because it was the first time the PLA made it a norm for the service commanders to serve as members of the CMC by virtue of their position, rather than on the basis of personal stature or political connections.<sup>14</sup> Although the commanders served as CMC members starting in 2004, they were all removed during the 19<sup>th</sup> Party Congress in 2017. Also of note, although Hu Jintao replaced Jiang Zemin as the CCP General Secretary and People’s Republic of China (PRC) President at the 16<sup>th</sup> Party Congress in 2002, Jiang retained the position as Chairman of the CMC until September 2004, at which time he stepped down and Hu became the Chairman.<sup>15</sup> Based on interviews by the author with PLA officers at that time, Jiang specifically negotiated with Hu to allow the PLAAF to have its own strategy and to have the three commanders added to the CMC as a tradeoff for him to step down.

The two PLAAF strategy components also served as the base for the PLAAF’s concept of a “Strategic Air Force” (战略空军), which was codified at the same time Hu laid out his New Historic Missions during the 17<sup>th</sup> Party Congress in November 2007. The 17<sup>th</sup> Party Congress called on the PLAAF to strive “to build a modernized ‘Strategic Air Force’ that will be compatible with the international stature of our country and capable of carrying out the historical mission of our armed forces.”<sup>16</sup> Being a ‘Strategic Air Force’ requires the PLAAF to participate in

joint operations as well as independent strategic actions to support the military and national development strategy of the country. The PLAAF intends to carry out its strategic mission through the use of “integrated air and space capabilities.”

Although the term “Strategic Air Force” had already been in use for several years, it did not appear for the first time in a *Defense White Paper* until 2008.<sup>17</sup> That document described the PLAAF as a “strategic service of the PLA,” and stated, “To meet the requirements of informationized warfare, the Air Force is working to accelerate its transition from territorial air defense to both offensive and defensive operations, and increase its capabilities for carrying out reconnaissance and early warning, air strikes, air and missile defense, and strategic projection, in an effort to build itself into a modernized Strategic Air Force.”<sup>18</sup> According to Chase and Garafola, “PLAAF strategists suggest this means the air force should play a decisive role in protecting Chinese national interests, field modern capabilities commensurate with China’s standing as a major power and enjoy the institutional status befitting its role as a ‘strategic service,’ which is an important consideration given the historical dominance of ground forces in China’s military.”<sup>19</sup>

The approval also signaled a fundamental shift in how the PLAAF was to be viewed. According to one article published in Hong Kong in June 2004, this change was encapsulated in three bold new assertions on the strategic positioning of the PLAAF:<sup>20</sup>

- First, the PLAAF is a national Air Force led by the CCP.
- Second, a modern Air Force must be built to “integrate air and space capabilities,” “coordinate offensive and defensive operations,” and unify information and firepower.
- Third, the PLAAF should be a Strategic Air Force standing side by side with the Army and Navy to achieve command of the air, ground, and sea.

China’s 2004 and 2006 *Defense White Papers* clearly show the growing importance of the PLAAF and its missions. However, although both white papers describe the PLAAF’s transition to “coordinated offensive and defensive operations,” neither paper referenced “integrated air and space.”

Even though the two white papers did not refer to this component, the PLAAF apparently threw its hat into the air/space ring by indicating its desire to become actively involved in managing China’s military space program with an emphasis on the informatization aspects. Specifically, in March 2004, the PLAAF published *Air and Space Battlefield and China's Air Force*, following in August 2006 with *The Science of Integrated Air and Space Operations*.<sup>21</sup> Although the first doctrinal book did not provide linkage between space and the PLAAF, the last chapter of the second book, which contains forewords by PLAAF commander General Qiao Qingchen and political commissar General Deng Changyou, lays out six steps for China in establishing a model in which “the PLAAF is the leading organization for ‘integrated air and space’, the PLAAF is . . . the leading organization to manage (管理) China’s military space force, and the PLAAF is the primary force for air and space combat.”<sup>22</sup> Although the book focuses on managing the “informatization” (信息化) aspects of the space program, it does not indicate that the PLAAF wants to manage the launch sites, satellite development, and missile program. The six proposed steps are as follows:

- Determine a scientific development model for creating a sound process for employing air and space power.
- Establish an Air Force Space organization (空军航天机构) to use as the base for

- organizing integrated air and space operations (空天一体作战).
- Establish PLAAF space units (空军航天部队).
- Establish information links that provide technology for integrated air and space operations.
- Nurture Air Force space personnel with a knowledge of space. [Note: Almost all of China's astronauts have been career PLAAF officers.]
- Expand the PLAAF's overall scope of warfighting power, increasing the PLAAF's air offense capabilities, air defense countermissile capabilities, and airborne troop combat capabilities.

In the introduction of *The Science of Integrated Air and Space Operations*, General Qiao states that, under the Party Central Committee's and CMC's leadership, the PLAAF is implementing the transformation from mechanization to informatization, from a force based on national air defense to one based on "coordinated offensive and defensive operations," from a force based on aviation to one based on "integrated air and space capabilities," and from a force based on quantity to one based on quality.<sup>23</sup>

In 2006, the PLAAF published *An Introduction to Air Force Military Thought* with opening remarks by PLAAF commander Qiao. The inaugural edition of this new Air Force primer argues that the PLAAF should use informatization to control the land and sea, and should move toward developing integrated air and space operations.<sup>24</sup>

In July 2009, the PLAAF published *Strategic Air Force* (战略空军论) that contains about 50 individual articles written by different authors concerning the subject.<sup>25</sup> Several articles discuss "integrated air and space capabilities." Of note, unlike the two previous books noted, this book was not considered an official publication because it was not part of a specified plan and it did not have a forward written by a senior PLAAF leader. It was merely a series of individual papers written by multiple authors interested in this topic. Of note, however, the introduction to the first section starts by stating that no country today that has space power has a space force (天军), nor does any country have or is preparing to have its space troops reside in a service outside of its Air Force. This is the crux of the PLAAF's argument that it should "manage" the PLA's space program. Various articles in the book detailed what a Strategic Air Force should be capable of performing, as "the development of national interests overseas calls for the Air Force to gradually possess certain capabilities to perform overseas operations."<sup>26</sup> This included long-range reconnaissance and surveillance, supporting joint maritime blockade, conducting long-range air transport and mobility, and carrying out long-range precision strikes outside China's borders. Based on this information, PLAAF training in 2015 and 2016 included all of these missions except explicit training for a maritime blockade.<sup>27</sup> According to China's 2015 Defense White Paper on Military Strategy, China's most recent military strategy provides further details in the context of PLAAF operational requirements to meet the needs of informatized warfare by emphasizing capabilities in several core areas including strategic early warning, air strikes, air and missile defense, information countermeasures, airborne operations, strategic projection and comprehensive support.<sup>28</sup> Since then, PLAAF training and activities reflect these missions in the maritime domain.

In November 2009, then-PLAAF commander Xu Qiliang gave a speech commemorating the PLAAF's 60<sup>th</sup> anniversary and responded to questions from the media concerning the new strategy, where he stated that "an integrated approach to aerospace operations is needed to ensure strategic dominance on the sea and ground."<sup>29</sup> However, the press changed the term air and space



(空天) to read space and air (天空), which misconstrued much of what Xu said in his statement.<sup>30</sup> According to Xu, “As far as the revolution in military affairs is concerned, the competition between military forces is moving towards outer space... this is a historical inevitability and a development that cannot be turned back. The PLA Air Force must establish in a timely manner the concepts of space security, space interests, and space development. Given China’s rapid economic development and increasing political influence, the development of the air force is not only aimed at national security but also regional stability and international peacekeeping. There is no border in the sky and space. Only power can protect peace.”<sup>31</sup> In addition, he said, “The PLA air force would improve its detection and early warning, air strike, anti-missile air defense, and strategic delivery capabilities in order to effectively protect China’s interests and help maintain regional and world peace.”<sup>32</sup>

The remaining part of this paper provides information about key events and published articles where the issue of “integrated air and space capabilities” has been raised, but very little substance has been provided. The key leaders involved in this concept include Hu Jintao, his successor, Xi Jinping, and the four PLAAF commanders since 2002 – Qiao Qingchen (2002-2007), Xu Qiliang (2007-2012), Ma Xiaotian (2012-2017), and Ding Laihang (2017-present).

## **Integrated Air and Space Operations**

While “integrated air and space capabilities” is one component of the PLAAF’s strategy, the PLAAF has used the term as the key component of a larger concept identified as “integrated air and space operations” (空天一体作战). The following paragraphs provide some context for this concept.<sup>33</sup>

According to Kevin Pollpeter, integrated air and space operations are defined differently by various sources, but all involve the integration of battlespace, forces, and activities. He notes that a 2003 article defined integrated air and space operations as “air forces, structure, and operational activities integrating aviation and space, air defense and space defense. Integrated air and space warfare refers to aviation and space offensive and defensive equipment merged into one to conduct simultaneous offensive and defensive operations. It includes aircraft, cruise missiles, and to different degrees includes ballistic missiles, satellites, orbiting space stations, and space planes. At the same time, it includes aviation interceptors, all types of ground-to-air missiles, air-to-air missiles, and new concept weapons such as high-power lasers, high power microwave weapons, and particle beam weapons.”<sup>34</sup>

Pollpeter notes that the authors of *Strategic Air Force* offer a similar definition in which air and space integration refers to integration of aviation and space in terms of structure, and the management of air defense, missile defense, and space defense in order to build a “new concept air force” made up of air and space forces. The integration of air and space is based on the lack of a boundary between the atmosphere and space, which leads the authors to conclude that an air and space integrated force is inevitable from the standpoint of technology, operations, environment, and experience.<sup>35</sup> According to Cai Fengzhen and Tian Anping, integrated air and space operations are “operations in which aviation and space forces are the main operational components. It includes other operational forces related to integrated air and space operations and is represented by joint operations in the air and space battlefield.”<sup>36</sup> In another venue, these authors define the air and space battlefield as an “integrated and information-oriented land (sea), air, and space battle arena,

which fully connects organizationally fused and organically combined space and aerospace and related capabilities in the domains of the surface of the Earth, and the land (sea).”<sup>37</sup> Cai and Tian also describe the air and space battlefield as the principal battlefield.<sup>38</sup> These various definitions, if differing somewhat in scope and precision, nevertheless present important common and cohesive themes regarding the integration of the air and space battlespace and the integration of air and space forces and operational activities.

### Concept Development Responsibilities

Typically, the PLAAF Headquarters’ Military Theory Research Department (军事理论研究部), which was subordinate to the former Headquarters Department (司令部) and now the Staff Department (参谋部), is responsible for overseeing all PLAAF theory development.<sup>39</sup> Depending on the topic, the PLAAF Command College in Beijing is normally given the responsibility for developing theory concepts across the board, including tactics. For example, two members of the Command College’s Strategy Research Office wrote about the impact of integrated air and space operations on “local,” or regional, wars in a 2005 article in *China Military Science*.<sup>40</sup> The article details the growing importance of air and space power on recent local wars, and notes that air force operations, in both the air and in space, will play an essential role in future Local Wars Under Informatized Conditions. One conclusion is that counterspace activities will be prominently featured. According to the article, “Aerospace integrated operations (*kongtian yiti zuozhan*; 空天一体作战) will become the main operational form (主要作战形式) of informatized operations.... One can also use anti-satellite weapons and aerial combat aircraft to interfere with, disrupt, or destroy enemy space-based systems, in order to seize air and space superiority. As there are developed lasers, directed-energy, anti-satellite, and other space-based combat/operational platforms, then stealth aircraft, unmanned strike aircraft, precision-guided weapons, and land, sea, and air-based anti-missile weapons, anti-satellite weapons will form an air-space integrated/unified operational system.”

However, it appears that the Air Force Engineering University in Xi’an, Shaanxi Province, assumed the overall responsibility for the “integrated air and space capabilities” theory. This was most likely because of the authors’ specialties. At least three members of this university have published books and articles on the subject of integrating air and space power. The two books were co-authored by Major General Cai Fengzhen and Senior Colonel Tian Anping in 2004 and 2006. In addition, Cai and Major Deng Fan wrote an article which appeared in 2006 in *China Military Science*.<sup>41</sup> Of note, it appears that Tian, who joined the PLAAF in 1974, has not published any articles since 2006.

The two books, each of which had a forward by the PLAAF commander Qiao Qingchen, would appear to constitute a move to establish a specific PLA Air Force role in the conduct of military space activities. All of these writings argue that there is a linkage between airpower and space power, and that future warfare will entail integration of the two. While there is extensive discussion of the relationship between traditional airpower and space power, however, there is only very limited discussion of counterspace activities. Of three sections in the books and article discussing integrated offensive and defensive combat systems (一体化攻防交战系统), for example, only one focuses on counterspace systems; the other two discuss electronic warfare and traditional airpower.<sup>42</sup>

## Aerospace Capabilities

Another key term is aerospace capabilities. According to Scott Harold, China employs a conceptual approach to military aerospace, which it defines by a focus on “integrated air and space” capabilities and “offensive and defensive operations”.<sup>43</sup> He notes that China’s military aerospace capabilities include manned and unmanned fixed- and rotary-wing aviation, ballistic and cruise missiles, and satellites and space-based assets—capabilities that the PLA operates across four services plus the Strategic Support Force. According to the *Chinese Air Force Encyclopedia*, aerospace capabilities include directed-energy weapons in addition to kinetic weapons.<sup>44</sup> Military aerospace operations can be divided up by 1) scale (strategic, campaign, and tactical); 2) in terms of area of domain (space-to-space, air-to-space, space-to-ground, air-to-ground, and air-to-air operations); 3) operational method (missile attack/defense, aerospace attack/defense, and air raid/counterraid operations); or 4) missions (integrated air-space information operations, integrated air-space offensives, integrated air-space defensive operations, and integrated air-space support operations).<sup>45</sup>

## Overall Management

Although information has been published about “integrated air and space capabilities,” no information was found concerning which one of the three PLAAF deputy commanders, which deputy chief of staff, or which second-level bureaus under the PLAAF Staff Department are responsible for managing the concept. Most likely, it is a combination of the Staff Department’s Operations Bureau (作战局) and Information and Communications Bureau (信息通信局) and possibly the Electronic Countermeasures and Radar Bureau (电雷局). It also appears that the PLAAF Equipment Department’s (装备部) Comprehensive Planning Bureau (综合计划局) is involved in managing the equipment component.<sup>46</sup> In addition, it appears that the PLAAF’s Dingxin Test and Training Base in the Gobi Desert created two division-level units in 2014 to deal separately with each concept of the new strategy.<sup>47</sup>

On 31 May 2019, CASI hosted a meeting with a visiting delegation from the PLAAF Command College, which included a discussion about “integrated air and space capabilities.” According to the delegation leader, Major General An Peng (安鹏), who is one of the Command College’s deputy commandants, “First of all, air must be strengthened, and space too. While the two are strengthened respectively, they are gradually integrated together, so we are now talking about the integration of air and space. At present, as far as our air force is concerned, we mainly use space information, because now technology isn’t there yet. We use that space information, including your GPS information and our Beidou system as well as some other space satellites. We mainly operate, including our pilots, in an environment where we are constantly getting space-based information about our progress throughout the course of our flight. This is a historic necessity. The Chinese People’s Liberation Army is also fully aware of this, so we still have to adhere to the development direction of the integration of air and space, but simultaneous offense and defense is more easily understood. We used to be mainly a territorial air defense air force. Now, with the expansion of our interests, we definitely cannot just take care of the house, but we must safeguard our territory, our oceanic rights and interests, and our sovereignty. Now, with the development of these, our interests are also expanding.”

A review of the PLAAF's official bimonthly journal, *China Air Force*, since 2004 revealed a number of articles discussing integrated air and space issues in general but nothing of substance concerning how the PLAAF was involved in China's space program.

### **Growing Maritime Activities**

Under former commander Ma Xiaotian, the PLAAF expanded its maritime flight activities, including creating a Maritime Training Base off of Guangdong Province in 2014. During a visit to the base while it was under construction in November 2014, he emphasized the use of “integrated air and space capabilities” for overwater operations and search and rescue. On the new urgency of improving maritime search and rescue operations, Ma stated that while “in the past, maritime activities were relatively infrequent,” now with “maritime military actions becoming more frequent,” the service must resolve such issues “as soon as possible.”<sup>48</sup>

Under the current commander, Ding Laihang, the PLAAF has continued to emphasize the importance of “integrated air and space capabilities” in the maritime domain. For example, the PLAAF's spokesperson, Senior Colonel Shen Jinke, stated that, “as part of the strategic goal of ‘integrating air and space capabilities, and coordinating offensive and defensive operations,’ the PLAAF will deepen maritime actual-combat military training. Furthermore, as a major maritime power, China's Air Force should be a ‘maritime longsword’.”<sup>49</sup> For example, according to He Shengqiang, who is the director of the Aviation Industry Corporation of China's (AVIC) H-6 series research and development team, “The H-6K bomber was designed as a mid- to long-range heavy bomber aircraft that could meet the Air Force's strategic goal of ‘integrating air and space capabilities and coordinating offensive and defensive operations’”. The three pillars behind the H-6K's design concept in simple terms are: to fly far, to hang more missiles, and to hit targets with precision. According to He, compared with other aircraft of the H-6 series, the H-6K enjoyed three major improvements. First, greater engine power. Second, cockpit layout optimization, which greatly reduced the number of crew members and allows for clearer division of labor. Third, improved electronic countermeasure capabilities and suite of sensors on par with systems equipped on 3<sup>rd</sup>-generation or even 4<sup>th</sup>-generation aircraft.”<sup>50</sup>

### **Use in the “Four Key Training Brands”**

According to Ding Laihang, the PLAAF has fully integrated the concept of “integrated air and space capabilities” into its “four key training brands” (四大品牌), which include the *Golden Helmet* (金头盔) military competition, the *Golden Dart* (金飞镖) military competition, the *Blue Shield* (蓝盾) exercise, which includes the *Golden Shield* (金盾) competition, and the *Red Sword* (红剑) exercise.<sup>51</sup>

Of note, on 13 October 2019, the PLAAF announced the addition of a fifth key training brand identified in Chinese as “*Qingdian*” (擎电); however, it is not clear if there is an official English name or how it will be implemented. According to the PLAAF's spokesperson, Senior Colonel Shen Jinke, stated that “whoever seizes the electromagnetic domain will master the war process, and the new training brand will ‘greatly improve the electronic warfare capability of the Air Force’.”<sup>52</sup> His comments focused on the electronic warfare aircraft that participated in the air show commemorating the PRC's 70<sup>th</sup> anniversary.

## **Guidance from Hu Jintao**

In May 2009, Hu Jintao attended the PLAAF's 11<sup>th</sup> Party Congress and gave a speech laying out overall guidance for the PLAAF.<sup>53</sup> Hu pointed out that “The Air Force is an important component of our country’s military forces, and holds a significant status and role in the overall situation of national security strategy. Air and space threats have become serious threats that China is facing, and also the threats that are most difficult to resist as well as the main threats to China’s homeland, especially the core areas of the country. On the other hand, China’s building of its integrated air and space force remains at the initial stage. Therefore, the challenge China is facing from the air and space military threats will become more salient and sterner. Therefore, quickening the building of China’s aerospace power and building a strong modernized People’s Air Force as the basis of ‘integration of air and space and combined offensive and defensive capabilities’ in an inevitability for coping with the challenge from the world’s air-space force development, and is also the right option for safeguarding China’s air and space security and development interests. To help accomplish its strategic transformation, the PLAAF must more quickly push forward the transformation oriented toward air-space integration. In addition, it is necessary to effectively resolve outstanding contradictions that affect the Air Force’s building and development. At present, it is necessary to further resolve the contradiction between the strategic requirements and the force structure through quickening the building of the Air Force’s integrated offensive and defensive power and corresponding supportive facilities as well as enhancing the Air Force’s information warfare and system confrontation capabilities.”

## **Guidance from Xi Jinping**

In April 2014, Xi Jinping visited PLAAF Headquarters, where he instructed all personnel “to strengthen organizational leadership and effectively coordinate and cooperate in relevant areas, to strengthen training that resembles actual combat, to strengthen reform and innovation, and effectively use talented personnel of all specialties.’ Furthermore, the overarching goal was to accelerate the development of an air force that ‘integrates air and space capabilities,’ which emphasizes the role of satellites and early warning aircraft, and that ‘coordinates offensive and defensive capabilities,’ which will provide strong support for achieving the China Dream and Strong Military Dream.”<sup>54</sup>

## **Conclusions**

The bottom line is that the PLAAF was searching for its own strategy from the 1980s until 2004, when the CMC approved “integrated air and space capabilities, coordinated offensive and defensive operations” as the official strategy, which then fit into the PLAAF’s goal of creating a “Strategic Air Force.” There were many pieces to the puzzle that came together in 2004, including Jiang Zemin stepping down as the Chairman of the CMC, a new version of the “Strategic Military Guidelines,” the 14<sup>th</sup> PLAAF Party Congress, and the addition of the Navy, Air Force, and Second Artillery Force commanders as CMC members. Although the “coordinated offensive and defensive operations” component has been easy to follow because of the information available concerning new weapon systems and training, very few details have been provided concerning the actual content of the “integrated air and space capabilities” component. Early speculation was that the PLAAF wanted to “manage” the PLA’s space program; however, that has not happened.

Whereas the GAD managed the space program until 2016, the PLASSF has now taken over that responsibility. As a result, the PLAAF has merely been focused on using space assets to be able to operate its systems in a more efficient manner; however, Xi Jinping and the PLAAF commanders continue to put out the concept to help bolster ongoing changes.

## Chinese Sources

Cai Fengzhen and Tian Anping, eds., *Air and Space Battlefield and China's Air Force* [空天战场与中国空军], (Beijing: Liberation Army Press, 2004).

Cai Fengzhen, Tian Anping, Chen Jiesheng, Cheng Jian, Zheng Dongliang, Liang Xiaoan, Deng Pan, and Guan Hua, eds., *The Science of Integrated Air and Space Operations* [空天一体作战学], (Beijing: Liberation Army Press, 2006).

*China's National Defense: 2015*, PRC State Council Information Office, May 2015.

Dai Jinyu, ed., *Science of Air Force Strategy* [空军战略学] (Beijing: National Defense University Publishers, July 1995).

Li Rongchang and Cheng Jian, *Integrated Air and Space Information Warfare* [空天一体信息作战], (Beijing: Military Science Press, 2003).

Yao Wei, ed., *Chinese Air Force Encyclopedia* [中国空军百科全书], (Beijing: Aviation Industry Press, November 2005), 57-60.

Yuan Jingwei, ed., *On The Integrated Aerospace Operations* [空天一体作战研究], (Beijing: National Defense University Press, 2006)

Zhang Jiali, Min Zengfu, "On Extending Regional War into the Air and Space," (Beijing: *China Military Science*, Vol. 1, 2005).

## English Sources

David Finkelstein, “China’s National Military Strategy: An Overview of the ‘Military Strategic Guidelines’,” in Roy Kamphausen and Andrew Scobell, eds., *Right Sizing the People’s Liberation Army: Exploring the Contours of China’s Military*, (Carlisle, PA: Army War College Strategic Studies Institute, 2007), 69–140.

Jana Allen and Kenneth Allen, *The PLA Air Force’s Four Key Training Brands*, (CASI, March 2019).

Kevin Pollpeter, “The PLAAF and the Integration of Air and Space Power” in Richard P. Hallion, Roger Cliff, and Phillip C. Saunders, eds., *The Chinese Air Force Evolving Concepts, Roles, and Capabilities*, (Washington, DC: National Defense University Press, August 2012), Chapter 7.

M. Taylor Fravel, *Active Defense: China’s Military Strategy since 1949*, (Princeton University Press, 2019).

Michael S. Chase & Cristina L. Garafola, “China’s Search for a ‘Strategic Air Force’,” (Journal of Strategic Studies, 2015).

Michael S. Chase & Cristina L. Garafola, “China’s Search for a ‘Strategic Air Force’,” (Jamestown Foundation: China Brief, Volume 15, Issue 19, 2 October 2015).

*People’s Liberation Army Air Force 2010*, (Dayton, OH: National Air and Space Intelligence Center (NASIC), 1 August 2010).

Richard P. Hallion, Roger Cliff, and Phillip C. Saunders, eds., *The Chinese Air Force Evolving Concepts, Roles, and Capabilities*, (Washington, DC: National Defense University Press, August 2012).

Scott W. Harold, *Defeat, Not Merely Compete*, (RAND, 2018).



## **Acronyms**

<b>Acronym</b>	<b>Full Term</b>
AMS	Academy of Military Science
AVIC	Aviation Industry Corporation of China
CASI	China Aerospace Studies Institute
CCP	Chinese Communist Party
CMC	Central Military Commission
GAD	General Armament Department
NASIC	National Air and Space Intelligence Center
PLA	People's Liberation Army
PLAAF	PLA Air Force
PLAN	PLA Navy
PLASAF	PLA Second Artillery Force
PLASSF	PLA Strategic Support Force
PRC	People's Republic of China

## ENDNOTES

---

<sup>1</sup> As with most key military terms and concepts, the PLA is not consistent in how it translates them into English. Specifically, the PLA has translated the term *kongtian yiti* in the following ways: “integrating air and space capabilities” and “integrated air and space capability.” This English term was found in the 2019 PRC Defense White Paper, which was only the second White Paper to use this term. The first time was in 2015. Zhao Lei, “PLA Air Force plans expansion into space to modernize capability,” *China Daily*, 13 November 2018, [www.chinadaily.com.cn/a/201811/13/WS5bea06aea310eff303288356.html](http://www.chinadaily.com.cn/a/201811/13/WS5bea06aea310eff303288356.html). In addition, the PLAAF uses the term integrated air and space operations (空天一体作战).

<sup>2</sup> Yao Wei, ed., *Chinese Air Force Encyclopedia* [中国空军百科全书], (Beijing: Aviation Industry Press, November 2005), 57-60. “From Supportive Service to Strategic Air Force: Major Change in China’s Air Force Buildup Thinking,” *Hong Kong Feng Huang Wang*, 28 June 2004. “From Supportive Service to Strategic Air Force: Major Change in China’s Air Force Buildup Thinking,” *Hong Kong Feng Huang Wang*, 28 June 2004.

<sup>3</sup> *China’s National Defense: 2019*, PRC State Council Information Office, May 2019, which is identified as the *Defense White Paper* in this paper. The first *Defense White Paper* was published in 1998 and was published every two years through 2012. The next version was not published until 2015 and then again until 2019.

<sup>4</sup> For example, from January 2014 through August 2015, the PLAAF’s newspaper, *Air Force News*, carried over 250 articles that included the three phrases noted, including 183 articles with the phrase “building a strong air force based on integrating air and space capabilities, and coordinating offensive and defensive operations”. All three terms continue to appear today; however, there is still virtually no substance provided to explain what they mean.

<sup>5</sup> “From Supportive Service to Strategic Air Force: Major Change in China’s Air Force Buildup Thinking,” *Hong Kong Feng Huang Wang*, 28 June 2004.

<sup>6</sup> David Finkelstein, “China’s National Military Strategy: An Overview of the ‘Military Strategic Guidelines,’” in Roy Kamphausen and Andrew Scobell, eds., *Right Sizing the People’s Liberation Army: Exploring the Contours of China’s Military* (Carlisle, PA: Army War College Strategic Studies Institute, 2007), 69–140. M. Taylor Fravel, *Active Defense: China’s Military Strategy since 1949*, (Princeton University Press, 2019).

<sup>7</sup> Dai Jinyu, ed., *Science of Air Force Strategy* [空军战略学], (Beijing: National Defense University Publishers, July 1995).

<sup>8</sup> Wang Jianyun, “We Must Win the Next Battle: Two Fighter Division Commanders’ Views of Simultaneous Offensive and Defensive Capabilities,” *China Air Force* [中国空军], No 85, 2000-2, 4-8.

<sup>9</sup> “NPC Standing Committee Adopts Civil Air Defense Law,” *Beijing Xinhua Domestic Service* in Chinese, 29 October 1996. “Text of People’s Air Defense Law,” *Beijing Xinhua Domestic Service* in Chinese, 30 October 1996.

<sup>10</sup> Ge Zhenfeng, ed., *Science of Military Strategy* [战略学], (Beijing: Academy of Military Science Press, October 2001, 26). The translation as “offensive air defense” comes from Cui Changqi, ed., *A New English-Chinese and Chinese-English Dictionary of Military Terms*, October 1999, 311.

<sup>11</sup> Cai Fengzhen and Tian Anping, eds., *Air and Space Battlefield and China’s Air Force* [空天战场与中国空军], (Beijing: People’s Liberation Army Publishing House, Mar 2004). Cai Fengzhen and Tian Anping, eds. *The Science of Integrated Air and Space Operations*, (Beijing: PLA Press, August 2006). At the time of the first book (2004), Cai was the commandant of the PLAAF Engineering University in Xian. At the time of the second book (2006), he had moved up to be one of the deputy chiefs of staff in the Headquarters Department at PLAAF Headquarters. Tian is an instructor at the PLAAF Engineering University.

<sup>12</sup> *China’s National Defense: 2015*, PRC State Council Information Office, May 2015

<sup>13</sup> *People’s Liberation Army Air Force 2010*, Dayton, OH: National Air and Space Intelligence Agency (NASIC), 1 August 2010. The first PLAAF commander, Liu Yalou, and fourth commander, Zhang Tingfa, also served as CMC members. Zhang also served as the 9<sup>th</sup> PLAAF political commissar before becoming the commander.

<sup>14</sup> Michael S. Chase and Cristina L. Garafola, “China’s Search for a ‘Strategic Air Force,’” *Journal of Strategic Studies*, 2015. Michael S. Chase & Cristina L. Garafola, “China’s Search for a ‘Strategic Air Force,’” (Jamestown Foundation: China Brief, Volume 15, Issue 19, 2 October 2015).

<sup>15</sup> Hu had served as one of the CMC vice chairmen starting in September 1999.

[https://en.wikipedia.org/wiki/Vice\\_Chairman\\_of\\_the\\_Central\\_Military\\_Commission](https://en.wikipedia.org/wiki/Vice_Chairman_of_the_Central_Military_Commission).

<sup>16</sup> Dong Wenxian, “Part I of the ‘Strategic Air Force’ Series: The Expansion of National Strategic Space Calls for a Strategic Air Force” [战略空军系列谈之一：国家战略空间扩展呼唤战略空军], *Air Force News* [空军报] February 2, 2008, 2. Kevin Pollpeter, “The PLAAF and the Integration of Air and Space Power” in Richard P.

---

Hallion, Roger Cliff, and Phillip C. Saunders, eds., *The Chinese Air Force Evolving Concepts, Roles, and Capabilities*. (Washington, DC: National Defense University Press, August 2012), Chapter 7, 169.

<sup>17</sup> Chase and Garafola, “China’s Search for a ‘Strategic Air Force’.”

<sup>18</sup> Information Office of the State Council, People’s Republic of China, *China’s National Defense in 2008*, Beijing, China, January 2009, [http://english.gov.cn/official/2009-01/20/content\\_1210227.htm](http://english.gov.cn/official/2009-01/20/content_1210227.htm).

<sup>19</sup> Michael S. Chase & Cristina L. Garafola, “China’s Search for a ‘Strategic Air Force’.”

<sup>20</sup> “China Plans To Build Strategic Air Force, Acquire Long-Range Bombers,” *Hong Kong Feng Huang Wang*, 28 June 2004.

<sup>21</sup> Cai and Tian, eds, *Air and Space Battlefield and China’s Air Force*. Cai and Tian, eds., *The Science of Integrated Air and Space Operations*. At the time of the first book (2004), Cai was the commandant of the PLAAF Engineering University in Xian. At the time of the second book (2006), he had moved up to be one of the deputy chiefs of staff in the Headquarters Department at PLAAF Headquarters. Tian is an instructor at the PLAAF Engineering University.

<sup>22</sup> Cai and Tian, eds., *The Science of Integrated Air and Space Operations*, 299-301.

<sup>23</sup> Cai and Tian, eds., *The Science of Integrated Air and Space Operations*, 2.

<sup>24</sup> Min Zengfu, ed., *An Introduction to Air Force Military Thought*, pp. 1-3.

<sup>25</sup> Zhu Hui, ed., *Strategic Air Force* [战略空军论], (Beijing: Lantian Chubanshe, July 2009). [The book does have the above English title. At that time, Zhu held an unidentified position at the PLAAF Command College.]

<sup>26</sup> Zhu Hui, ed. *Strategic Air Force*, 46.

<sup>27</sup> Michael S. Chase, Dave Ochmanek, Lyle J. Morris, Cristina L. Garafola, Timothy R. Heath, Kenneth Allen, Mark Cozad, Nathan Beauchamp-Mustafaga, Edmund Burke, Astrid Stuth Cevallos, Eric Heginbotham, and Kevin Pollpeter, *Chinese Aerospace Power Projection Development and Execution: Proceedings from the Second Annual China Aerospace Studies Institute (CASI) Conference*, RAND, 2016. Mark R. Cozad and Nathan Beauchamp-Mustafaga, *People’s Liberation Army Air Force Operations over Water: Maintaining Relevance in China’s Changing Security Environment*, RAND, 2017.

<sup>28</sup> Information Office of the State Council, *China’s Military Strategy*, reprinted by Xinhua, 26 May 2015, p. 6.

<sup>29</sup> [http://www.cas.cn/xw/zjsd/200202/t20020224\\_1683499.shtml](http://www.cas.cn/xw/zjsd/200202/t20020224_1683499.shtml); “Xu Qiliang: The Chinese Air Force Must Have an Aerospace Security Perspective” [许其亮：中国空军必须树立空天安全观], Xinhua, 1 November 2009, at <http://mil.news.sina.com.cn/2009-11-01/1424572155.html>.

<sup>30</sup> The author of this report conducted an interview with PLAAF officers in Beijing after the speech, who pointed out the inconsistencies between what Xu said and what was reported.

<sup>31</sup> Stephen Chen and Greg Torode, “China ‘To Put Weapons in Space’,” *Hong Kong South China Morning Post Online in English*, 3 November 2009.

<sup>32</sup> “China’s PLA Air Force Eyes Future in Space, Air: Air Force Commander,” *Beijing Xinhua in English*, 1 November 2009.

<sup>33</sup> The information in this section come from Kevin Pollpeter, “The PLAAF and the Integration of Air and Space Power” in Richard P. Hallion, Roger Cliff, and Phillip C. Saunders, eds., *The Chinese Air Force Evolving Concepts, Roles, and Capabilities*. (Washington, DC: National Defense University Press, August 2012), Chapter 7, 165-190 The original footnotes are added as well.

<sup>34</sup> Zhang Wei, “Discussion on Speeding up the Development of Integrated Air and Space Warfare Equipment” [试论加快空天一体战装备发展], *Ground-based Air Defense Weapons* [地面防空武器], no. 1 (2003), 2.

<sup>35</sup> Zhu Hui, ed., *Strategic Air Force* [战略空军论] (Beijing: Blue Sky Press, 2009), 39.

<sup>36</sup> Cai Fengzhen and Tian Anping, *Integrated Air and Space Operations Studies* [空天一体作战学] (Beijing: Liberation Army Press, 2006), 2.

<sup>37</sup> Cai Fengzhen and Deng Fan, “Introduction to the Air and Space Battlefield and National Air and Space Security System” [空天战场与国家空天安全体系初探], *China Military Science* [中国军事科学] 19, No. 2, (Beijing: Academy of Military Science Press, 2006), 44.

<sup>38</sup> *Ibid.*

<sup>39</sup> This department was established around 1999. It is noted in the comments section of Cai and Tian, *The Science of Integrated Air and Space Operations*, 308.

<sup>40</sup> Zhang Jiali, Min Zengfu, “On Extending Regional War into the Air and Space,” *China Military Science*, no. 1 (2005), 41.

<sup>41</sup> Cai Fengzhen, Tian Anping, *Air and Space Battlefield and the Chinese Air Force*; Cai and Tian, *The Science of Integrated Air and Space Operations* (Beijing: People’s Liberation Army Publishing House, Aug 2006), and Cai Fengzhen, Deng Fan “Introduction to Air and Space Battlefields and National Air and Space Security Systems”, *China Military Science*, no. 2 (2006). According to the October 2006 and October 2008 *Directory of PRC Military*

---

*Personalities*, 261 and 54, respectively, Cai was the commandant of the Engineering University from July 2004 to May 2007, when he became one of the deputy chiefs of staff in PLAAF Headquarters. According to interviews with PLAAF officers, Tian was the real author and Cai merely added his name. Biographies of Cai and Tian on the inside cover of the two books identify Tian as an instructor and researcher at the University, but do not identify any specific department or research office.

<sup>42</sup> Cai Fengzhen, Tian Anping, *The Science of Integrated Air and Space Operations*, 158-172.

<sup>43</sup> The information in this section comes from Scott W. Harold, *Defeat, Not Merely Compete*, (RAND, 2018), 7.

<sup>44</sup> Dai Jinyu, Dong Changjun [戴金宇, 董长军], "Air-Space Warfare Theory" [空天一体作战理论] in China Air Force Encyclopedia Editorial Advisory Board, eds., *Chinese Air Force Encyclopedia*, Vol. 1 [中国空军百科全书, 上卷], (Beijing: Aviation Industry Publishing House), November 2005), 46-47.

<sup>45</sup> "Integrated Air-Space Operations (Part 1)" [空天一体作战 (上)], *Xinhua*, 23 November 2015.

<sup>46</sup> Zhao Lei, "PLA Air Force Plans Expansion into Space to Modernize Capabilities," *China Daily*, 13 November 2018, <http://www.chinadaily.com.cn/a/201811/13/WS5bea06aea310eff303288356.html>.

<sup>47</sup> Qian Xiaohu and Du Kang, "Strong military wind and thunder and drums; three services to take off; the military's people's congress representatives are in the eyes of the strong army," *Jiefangjun Bao* (PLA Daily), 15 March 2016, 6.

<sup>48</sup> Yang Qingqun, "While Inspecting a Certain Guangzhou Military Region Air Force Unit, Ma Xiaotian, Member of the Central Military Commission and Commander of the Air Force, Emphasized that Joint Maritime Search and Rescue Will Require Integration of Military and Local Organizations and High Command Efficiency" [中央军委委员、空军司令员马晓天在广空部队检查调研时强调:海上联合搜救要军地-体多元融合指挥高效], *Air Force News* [空军报], 10 November 2014, 1.

<sup>49</sup> *China Air Force*, January 2018 and May 2018.

<sup>50</sup> *China Aviation News*, 15 March 2018.

<sup>51</sup> <http://mil.sohu.com/20160725/n460832855.shtml>. <http://news.163.com/17/0507/03/CJQ7CDG600018AOP.html>. Kong Zhengxuan, Air Force News, 27 September 2017, 1. See Jana Allen and Kenneth Allen, The PLA Air Force's Four Key Training Brands, CASI, March 2019 for details on the brands, [https://www.airuniversity.af.edu/Portals/10/CASI/Books/The\\_PLA\\_Air\\_Forces\\_Four\\_Key\\_Training\\_Brands.pdf?ver=2018-05-31-112649-217](https://www.airuniversity.af.edu/Portals/10/CASI/Books/The_PLA_Air_Forces_Four_Key_Training_Brands.pdf?ver=2018-05-31-112649-217).

<sup>52</sup> Zhang Mimi and Li Yan, "Air Force actual combat training launched 'Qingdian' to enhance electronic warfare capabilities" [空军实战化训练推出“擎电”提升电子战能力], *Xinhuanet*, 14 October 2019, [http://www.xinhuanet.com/2019-10/14/c\\_1210311248.htm](http://www.xinhuanet.com/2019-10/14/c_1210311248.htm).

<sup>53</sup> Shang Jinsuo, Li Zhen, Li Liguang, and Wang Pingping, "Scientific Theoretical Guide for Development of People's Air Force at New Stage in New Century: Studying Hu Jintao's Important Exposition on Air Force Building" [新世纪新阶段人民空军建设发展的科学理论指南:学习胡锦涛关于空军建设的重要轮速], *Military Science Journal*, Volume 6, 2010 Beijing: Academy of Military Science Press), 9-16.

<sup>54</sup> "Chinese President Urges Stronger Air Force," *Xinhua*, 14 Apr. 2014.