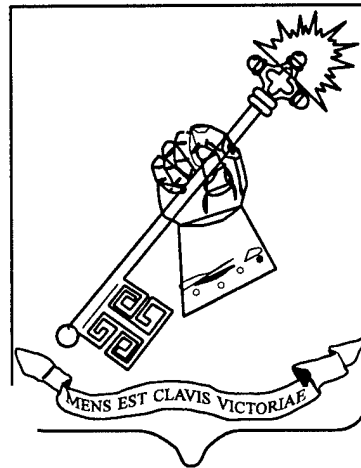


# CONTINUING FRICTION BETWEEN THE ARMY AND THE AIR FORCE: Different Perspectives

A Monograph  
By  
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19960617 034

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First Term AY 95-96

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# REPORT DOCUMENTATION PAGE

Form Approved  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
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4. TITLE AND SUBTITLE <i>Continuing Friction Between the Army &amp; the Air Force: Different perspectives</i>	5. FUNDING NUMBERS
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6. AUTHOR(S) <i>Maj Charles W. Johnson</i>	
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <i>School of Advanced Military Studies Command and General Staff College Fort Leavenworth Kansas 66027</i>	8. PERFORMING ORGANIZATION REPORT NUMBER
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9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) <i>Command and General Staff College Ft Leavenworth Kansas, 66027</i>	10. SPONSORING/MONITORING AGENCY REPORT NUMBER
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11. SUPPLEMENTARY NOTES
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12a. DISTRIBUTION/AVAILABILITY STATEMENT  <p style="text-align: center;">APPROVED FOR PUBLIC RELEASE. DISTRIBUTION UNLIMITED.</p>	12b. DISTRIBUTION CODE
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13. ABSTRACT (Maximum 200 words)
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14. SUBJECT TERMS <i>Inter-service Rivalry, Army Concerns, Air Force concerns, Air Assets, Control of Theater Air, Air Support, Command &amp; Control of Theater Air, Theater Warfare, Air Commanders, Ground Commanders</i>	15. NUMBER OF PAGES <i>57</i>
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT <i>Unclassified</i>	18. SECURITY CLASSIFICATION OF THIS PAGE <i>Unclassified</i>	19. SECURITY CLASSIFICATION OF ABSTRACT <i>Unclassified</i>	20. LIMITATION OF ABSTRACT <i>UNLIMITED</i>
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## ABSTRACT

### CONTINUING FRICTION BETWEEN THE ARMY AND THE AIR FORCE: DIFFERENT PERSPECTIVES

This monograph discusses the difference between both ground and air commanders who are subordinate to an overall theater commander. Although joint doctrine has evolved and improved, there are still differences between the two kinds of commanders due to the different theater views they hold. The ground commander is generally concerned with his locality and area of interest, while the air commander is concerned with a theater-wide prosecution of the conflict. These two views tend to be at odds with each other, and conflict between the two kinds of commanders tends to develop.

To examine this phenomena, the monograph uses two case studies that occurred nearly fifty years apart. The first case study is the North African campaign that occurred in 1942 and 1943. The second case study is the Gulf War that occurred in 1990 and 1991. Using both primary and secondary sources, the monograph examines the doctrine that was available prior to the respective conflicts, how the theater command architecture evolved in each case, and how the differences between the two commanders developed during the respective conflicts.

After examining these two case studies individually, the monograph compares the two conflicts. First of all, the doctrine was not much help in either case. It was developed in peacetime by consensus, and therefore allowed each service to "see" the potential use of military force the way it wanted to. It didn't stand up to the rigors of combat and solutions had to be hastily implemented. Secondly, in both cases, the implementation of a strong, unambiguous theater command architecture helped the situation. It did not, however, satisfy the more local requirements of the ground commanders. The air commander had to balance the theater-wide requirements of the CINC against the ground commanders' more localized requirements.

With this information in mind, the monograph develops conclusions about future situations air and ground commanders will be involved in. First of all, any scarce weapon with theater-wide flexibility will probably be centralized under the CINC's control. Next, though each situation will be different, the two perspectives will probably be present. Therefore, both types of commanders need to be aware that there is another viewpoint, and work to iron out the differences based on the specific situation. This will require trust in an environment that lends itself to distrust. Third, air commanders need to be aware that centralizing theater assets (aircraft) won't automatically reduce the concerns of the ground commanders. In fact, it makes ground commanders more concerned that aircraft won't be available when they need them. Finally, the ground commanders need to be aware that the air commander is balancing the requirements of local air support to various ground commanders with the CINC's theater-wide view of aircraft employment.

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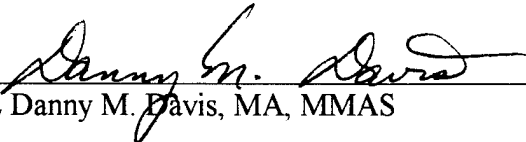
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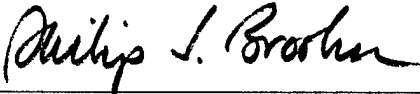
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Accepted this 14th day of December 1995

## ABSTRACT

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## Continuing Friction Between the Army and the Air Force

### I. Introduction

The ground commander wants to win his fight. He may not fully understand all the mechanics of operating an air force, but he is fully aware of the power it adds to his combat strength. Because of this, he wants to make sure that tactical air power is available to him when he really needs it. He also expects to be free from interference by enemy air forces. With that in the back of his mind, he does not want to be “trapped” in a command and control structure that may put him in a situation where air support is not responsive to his needs. If he has operational control (OPCON) over some aircraft, he can avoid that situation. Conversely, he knows that if he doesn’t have some measure of control, somebody else may be using that resource for something else when he needs it. Aircraft always seem to be a limited resource. While the ground commander understands the various uses of tactical air power beyond his area of operations, he’s very hesitant to take the risk that *his* ground force could be uncovered.

Equally, the air commander wants the ground commander to win his fight. He, like the ground commander, is well aware that airpower can greatly aid the attainment of this goal. At the same time, the air commander wants to be free to strike lucrative targets that, while they may ultimately contribute to the ground commander’s long term success, are beyond the latter’s immediate horizon. To the air commander, given the range and flexibility of modern air weapons, this requires a theater-wide view. Because of this, the air commander does not want to be “trapped” in a command and control structure that will commit the limited resources at his disposal piecemeal against targets of limited value.

This would reduce the overall effectiveness of the available aircraft. The air commander wrongly assumes his view is intuitively obvious. It is not. He learned his view from experience that most other people don't have. Even when the air commander correctly articulates his view, that both air and ground commander will both be better off in the long run, the ground commander is hesitant to accept it. The ground commander tends to see this argument as proof that the air commander is not totally committed to providing air support for him if and when *he really needs it*.

During peacetime there is no real requirement to prioritize among competing requirements. Friction arises, however, between the two commanders when combat is imminent or in progress. The conflict tends to ensue between ground and air commanders who are subordinated to an overall theater commander. In this case, the air commander has theater-wide air responsibility, while the ground commander has more localized, or focused, concerns. The air commander must "juggle" his operational (theater) or strategic air responsibilities with the air support he gives the ground commander to contribute to the latter's tactical fights. This juggling of resources is often lost on the ground commander, who has pressing needs for air support in his locality. Competition between requirements for the theater-wide and local uses of aircraft results.

This competition does not go away if the ground commander holds appointments as both the theater commander and the ground commander. As the theater commander, he will get what he requires, but will alienate the subordinate ground commanders if he favors the theater-wide use of aircraft at their expense. Likewise, he will alienate the air



commander if he favors local air support for his subordinate ground commanders at the expense of more lucrative and more distant targets. Frustration will result in either case.

The issue of prioritization of finite air resources in support of the ground commander's local tactical situation seems to be the crux of the argument between ground and air commanders. This is because the ground commander fails to see why *all available* air power can't provide support for his local objectives. Conversely, though the air commander knows air support is important, it is only *part* of the whole theater air mission he is supervising, and for him, not necessarily the first priority. By examining the issues that divided ground and air commanders in two wars that occurred nearly 50 years apart, it's possible to show that this central argument still exists. By shedding light on the two positions, this paper hopes to provide a starting point for developing an acceptable solution for both sides. If the argument is too difficult for procedural solution, shedding light on it will at least prepare both commanders for the issues they can expect in future Joint warfare. If nothing else, this paper purports to make both commanders understand that the issue may have to be resolved according to the specific situation they are facing.

The two case studies are the North African Campaign of 1942-1943, and the Persian Gulf war of 1990-1991. Accordingly, the first area for examination for each case will be a review of the doctrine that described the Army-Air force relationship prior to going into action. It will be helpful to see how the services thought air-ground integration should work. Next, the command structure in each case will be reviewed, since it impacts on the argument. After that, the ground and air commanders' views will be examined. The paper will ask A) what priorities did the ground commanders have in terms of air

missions and control?, and B) what priorities did the air commanders' have vis a vis the ground commanders' requests? After reviewing both cases, a comparative analysis between them will be conducted to see to what extent the ensuing arguments remain the same. The issues addressed will be those of prioritization and control, and the consequences of the choices made in either case. Finally, conclusions will be drawn on the affect the central argument could have on the relationship between the two services, and what commanders can do to facilitate the service interface in the future.

## II. Doctrine prior to the Tunisian Campaign

Throughout the inter-war period, doctrine governing air operations in the US Army generally leaned more and more in favor of the Airman's point of view - on paper, anyway. At first unofficial, but widely held by many airmen, this body of concepts included an emphasis on offensive use of the air weapons with primary attention given to the destruction of the enemy's air force, along with the expectation that air forces would be concentrated against a primary objective -- not dispersed against several different targets or categories of targets.<sup>1</sup> The first official sanction of these views came in the War Department's Training Regulation TR 440-15, Employment of Air Forces of the Army, in October, 1935. The manual that replaced TR 440-15 was Army Field Manual 1-5, Employment of Aviation of the Army. The manual also showed attitudes favoring the airman's point of view in its 1939, 1940, and 1941 versions. The idea or principle of centralized command and control was established, as well as cautions against frittering away aircraft on "direct attacks against small detachments or troops which are well

entrenched or disposed.”<sup>2</sup> It must be made clear here, however, that the airmens’ views were never completely dominant, simply mentioned and sometimes stressed.

As the US approached its first land combat in North Africa, the Air Corps was structured along lines providing for centralized control of air forces. Operating air forces were divided into centralized Numbered Air Forces, which had subordinate Bomber, Fighter, and Air Support Commands within them. The Air Support Commands were designed solely to support the ground forces’ needs for air support and were made up initially of recon and observation aircraft, but later included fighter and light bomber units.<sup>3</sup> The doctrine that determined how the ASCs would be employed with the Army came in the form of FM 31-35, Aviation in Support of Ground Forces, published in April, 1942.<sup>4</sup> Interestingly, this doctrine didn’t subordinate the ASC commander to the ground force commander. It did, however, state that the most important targets for the ASC would be the ones that constituted the most serious threats to the supported ground force.<sup>5</sup> This structure centralized the control of the air forces, but assigned an airman and associated ASC to work with and coordinate air support for a local tactical commander.

FM 35-31 and the centralized Numbered Air Force structure provided both air and ground commanders a reason to interpret the command relationship the way they wanted to; therefore, it provided great potential for conflict. Taken by itself, FM 35-31 could be interpreted as giving ground commanders defacto control of the ASCs. The ground commander could easily mistake the airman and associated air resources as “his airman,” and “his” air force. Conversely, the airman could see himself in a centralized air control structure, where he got his work from the local ground commander, but worked for the

Numbered Air Force commander. If push came to shove, and air resources were scarce, the ASC commander theoretically could get additional resources from his Numbered Air Force Commander. The Numbered Air Force commander, however, had to choose, whether to divert resources from his Fighter or Bomber commands, or leave the ground forces without what *they* believed they required. In practice, he would have to justify his decision to a common senior commander, normally the Theater Supreme Commander.

### III. North Africa Theater Command Architecture

The eighth of November, 1942, saw the landing of Allied forces on the Northwest corner of Africa. Within two days all resistance had caved-in near the three landing sites in Morocco and Algeria. The race for Tunisia was on. The combined command structure, however, was much more disjointed than the apparent ease of the landings indicated. Furthermore, the command structure evolved as the campaign went along.

Command during the landing phase of TORCH was entirely decentralized. Eisenhower, as theater commander, directly commanded three different task forces, with no intermediate between himself and his task force commanders. The eastern task force was initially led by US Major General Charles Ryder, but was afterward commanded by British Lieutenant General K.A.N. Anderson. The center task force was commanded by US Major General Lloyd Fredendall. The third, or western, task force was commanded by US Major General George Patton.<sup>6</sup> Additionally, Eisenhower had two separate air commanders with associated air forces that worked directly for him. The first one was British Air Marshall William Welsh who commanded Eastern Air Command (RAF). Welsh supported General Anderson's eastern task force. Eisenhower's second air force

was Brigadier General James Doolittle's XII Air Force. It was named Western Air Command, and was further divided into two subordinate geographic commands, to provide air support for the center and western task forces. These XII AF subordinated geographic commands were lead by a US Army Air Corps colonel in one case and a US Army Air Corps brigadier general in the other. They supported Fredendall and Patton, respectively.<sup>7</sup> Doolittle remained in overall control of XII Air Force, or Western air Command, but not Welsh's Eastern Air Command.

The friction caused by logistics problems and enemy actions soon stalled Eisenhower's combined force in its eastward drive across Northwest Africa. Accordingly, changes were made in January to both the ground and air command structures. General Anderson's eastern task force was renamed 1st (British) Army, and Fredendall's center task force renamed US II Corps. Fredendall was promoted, but both he and Anderson continued to report directly to Eisenhower.<sup>8</sup>

The air command structure in the western desert was centralized as an interim measure in early January. Although the Casablanca Agreement would eventually centralize control of all Allied forces in Africa, it wasn't to be implemented until mid-February. Eisenhower's experience indicated he needed to centralize his air forces in the Western Desert before then. In this case, all the air forces in the Western Desert were assigned to Major General Carl A. Spaatz, who reported directly to Eisenhower. Spaatz, in turn, had two air forces within his Allied Air Forces command. The first was the British Eastern Air Command that included Coastal Command and 242 Group (RAF). The Coastal Command's mission was primarily strategic interdiction of Axis shipping, while

242 Group's purpose was to support General Anderson's 1st Army. The second air command under Spaatz was XII Air Force. XII included XII Bomber Command for strategic work, and XII Air Support Command (ASC) to support Fredendall's II Corps.<sup>9</sup>

The Axis attack on Allied Forces from Pont-du-fahs toward Ousseltia that started on 18 January caused the air and ground theater architecture to change once again. Eisenhower realized his span of control was too big. He couldn't command both the ground forces along the front and the overall theater at the same time.<sup>10</sup> On 22 January he placed General Anderson in command of the ground forces, making him the only ground commander who reported directly to Eisenhower.<sup>11</sup> That same Axis attack also had shown that ground commanders were having trouble "sharing" aircraft from their respective air support commands with other adjacent ground commanders when the situation dictated.<sup>12</sup> To solve that, Spaatz created, with Eisenhower's concurrence, a Northwest Africa Tactical Air Force. In effect, Spaatz took assets from Eastern Air Command's 242 group and XII Air Force's Air Support Command and merged them into a theater Air Support Command while retaining the ground commanders' respective air support headquarters.<sup>13</sup> This allowed Air Support assets to be used anywhere along the front, according to which ground commander needed support.

The final theater changes came about as the result of the full implementation of the Casablanca conference. This occurred in mid-February. General Alexander's British forces had moved west chasing Rommel, and were close enough to be included in a true theater command structure. This structure included Eisenhower as the Supreme Commander, with General Alexander reporting to him as overall ground commander and

Air Marshall Tedder reporting to him as overall air commander.<sup>14</sup> The device used to get air support to any of the three major ground units was Tedder's Northwest African Tactical Air Force, commanded by Air Vice Marshall Conningham.<sup>15</sup> Conningham, in turn, supported each of the three major ground units with an associated tactical air force. British 242 Group supported 1st Army, XII ASC supported US II Corps, and the primarily British Desert Air Force supported 8th Army. Although the commanders of 242 Gp, XII ASC, and Desert Air Force all commanded their respective air forces, Conningham could, and at times did, shift them to support the major ground units that needed support the most.

This tracing of the evolution of the North West Africa theater command structure shows several things. First, it shows a very decentralized (air and ground) system that gradually moved, by necessity, to a very centralized one. Secondly, with the exception of the landing phase, this command evolution shows that the air forces were in fact centralized under one theater air commander, who reported directly to the theater commander. Finally, the command evolution shows how the ground commander could have construed their supporting air commanders as "their" air forces. In every instance, the ground commanders were supported with some form of air support that was tied directly to their unit. In other words, there was a centralized headquarters controlling all air resources. Beneath that were decentralized headquarters that were organized functionally. The functionally organized Air Support headquarters had associated subordinate headquarters that were charged with air support of the major ground elements, within the assets assigned at any particular time. The major supported ground

units were 1st Army, II Corps, and 8th Army. In effect, the commanders in these units each had an airman, with air forces, assigned to support them. However, the aircraft could be assigned missions to support other major ground commanders, as the situation dictated, since the aircraft were centrally controlled. Most of the time, this left the major ground commanders with at least some aircraft for their own use. More importantly, it gave the ground commanders a conduit through which they could make their wants and desires known.

#### IV. Ground Commanders' Views in the North African Campaign

By late November, the drive for Tunisia had stalled. On Christmas Eve, Eisenhower called for an operational pause in order to straighten out logistics and command lines. It seemed the race for Tunisia was lost. More important, the prioritization that allied ground commanders placed on employment of scarce air resources was revealed before and after that stalled drive. The two types of missions the allied ground commanders requested most consistently were air defense cover, or "umbrellas," and close air support. The third thing the ground commanders wanted was not a specific mission, but rather a characteristic of the first two. The ground commanders wanted their troops to see friendly aircraft overhead, so that the troops would know they were, in fact, receiving air support. They also wanted faster response time from supporting air units for all types of missions flown.

Defense against German dive bomber attacks was the primary air mission in the minds of many allied ground commanders. Because of this, LTG Anderson, Commander of First Army, asked primarily for air cover for his ground formations.<sup>16</sup> Although he



understood and at times requested attacks on Axis airfields, he seemed to be most concerned about getting defensive air umbrellas over his troops.<sup>17</sup>

This perception that friendly troops were vulnerable to enemy air attack was not just General Anderson's. Division and brigade commanders in First Army claimed that their most persistent problem was air attack by the supposedly obsolete Stuka dive bomber.<sup>18</sup> Reality supported this perception. The only available Allied fighter bases were so far behind the lines that allied aircraft loiter time over friendly forces was very short. The "obsolete" Stukas, assisted by radar, would simply return to their own airfields until the Allied fighters had to leave station, then return to the attack.<sup>19</sup> The British were not the only people with this problem. American commanders in U.S. II Corps had similar experiences.

Gen. Omar Bradley, II Corps Deputy commander, recorded that "the Luftwaffe ranged the Tunisian front almost unmolested. The sound of the aircraft had become the signal to halt and take cover by the roadside."<sup>20</sup> Gen. Bradley also noted problems with Axis air near the end of the Campaign, as II Corps supported British General Montgomery's breakout from the Mareth Line. Bradley felt that II Corps was continually attacked by Axis air. This led to bitter feelings toward the supporting air command.<sup>21</sup>

The ground commanders' second priority for air was close air support, or what disgusted airmen would refer to as airborne artillery. If allied forces were not being attacked from the air, the ground commanders next turned to requesting air missions that attacked enemy troops close to the front of their own lines. The ground commanders seemed adamant that any other use of the aircraft was unacceptable to them.

In January of 1943, Brigadier V.C. McNabb, the First Army Chief of Staff, related to Major General Spaatz that his boss “wanted the whole effort put on ground positions immediately in front of our troops in the coming offensive.”<sup>22</sup> This is consistent with a member of Spaatz’s staff who related that Gen. Anderson had told him that support of allied ground forces remained the primary task of Allied aviation, and that his [Anderson’s] priority was not bombing enemy airfields.<sup>23</sup>

Similar strong feelings were expressed by American ground commanders. In early February 1943, Lieutenant General Fredendall indicated to Spaatz that he wanted ‘full air coverage’ to support his troops and artillery. Fredendall related that if he did not get two full days of support, his coming offensive would fail.<sup>24</sup> Additionally, on many occasions, ground commanders requested that available recce aircraft be used to strafe and bomb enemy positions in front of their ground forces, even though the recce birds weren’t optimized for the close air support mission. Amazingly, the ground commanders were then surprised when their requests for recce missions couldn’t be fulfilled.<sup>25</sup>

If they were not being attacked by enemy air, it seems the ground commanders wanted as many aircraft as possible provided for close air support. If every available platform was not performing close air support, they were not completely happy.

The third priority the ground commanders wanted was not really a mission at all. Rather, it was a condition the ground commanders derived from the first two missions. First of all, they wanted their troops to see friendly aircraft overhead. Secondly, they wanted faster response times for all types of missions. The first characteristic, visibility,

was important enough to be mentioned frequently and emotionally in their argument for prioritization of aircraft to close air support.

Ground commanders felt that the allied aircraft overhead would be useful as a morale builder. Although there was debate among both air and ground commanders about how much damage US II Corps was taking from enemy air attack, it was definitely a factor to Major General Fredendall. He wanted his men to see some bombs dropped on the positions immediately to their front, and if possible, some dive bombers brought down in sight so that their morale would be bolstered.<sup>26</sup> For Major General Fredendall, at least, this shows that aircraft visibility was a factor in his prioritization of aircraft utilization.

One ground commander in First Army went so far as to state that aircraft visibility to his own troops was more important than anything else for which the aircraft could be used. Brigadier General Paul M. Robinett, the commander of Combat Command B in First Army, said that “men cannot stand the mental and physical strain of constant aerial bombing without feeling that everything possible is being done to beat enemy air efforts.”<sup>27</sup> In this case he was using the “visual” argument to justify air defense cover. Additionally, Robinett thought that what was needed were not reports or photographs of ships being sunk, ports being smashed, or cities being bombed to ashes. More important to Robinett, the men should see allied aircraft over their front line positions attacking targets in the path of allied operations.<sup>28</sup> In stating this, Robinett was echoing the position held by most allied ground commanders. To them, the only way to “ratchet up” their priority for air missions was to place the aircraft under control of the ground commanders.<sup>29</sup> To Robinett and his fellow ground commanders, it looked as if air leaders

would not properly prioritize ground commander requests until they were actually subordinated to the ground commanders.

The second characteristic the ground commanders consistently requested was a faster response time. They seemed to conclude that response time would not be so long if the air commanders were more concerned about prioritizing the ground commanders' requests.

It was, in fact, hard to request and get the air missions to the ground forces in a reasonable amount of time. Major General Charles Ryder, the commander of the 34th Infantry division said, "the system of calling through two or three different headquarters for air support will simply not give the desired support at the desired time. Adequate air support can only be obtained by a direct call from division to air. Any other system is too slow and will result in loss of opportunities."<sup>30</sup> Colonel William Kern, a battalion commander in 1st Armor Division, had similar thoughts on the slowness of the air request system. He felt that the system of going back through so many channels was wrong, and believed a simpler system was required.<sup>31</sup>

The control issue, vis a vis responsiveness, was raised again by Brigadier General Robinett in a letter to General Marshall in May 1943. In the letter, Robinett tells Marshall that the Germans get responsive air missions but that the Allies do not. Because of this, Robinett recommended (again) putting aircraft under control of the ground commanders.<sup>32</sup> The desire for control in this case was a symptom of failure (or at least perceived failure) to get a quick response for air missions, not a question of priority.

Robinett's comments to Marshall boiled down to the fact that it was too hard to call back and get air support if the ground commanders didn't have control of the aircraft. At the time he wrote to Marshall, however, the Allies enjoyed general air superiority in Africa. Additionally, the Allies had stepped up interdiction and strategic attack in preparation for Operation Husky. Robinett had *seen* the effects of air superiority, but not so much the affects of air interdiction or strategic air attack. In his mind, aircraft doing air interdiction (or any non-battle field mission) were not as important to his success. He naturally prioritized aircraft for missions he could use within his local area of responsibility.

Colonel Kern and Generals Ryder and Robinett weren't the only ones concerned with responsiveness of air missions. Even near the end of the campaign, both Generals Bradley and Patton felt that one of the weakest links in the air ground system was the reliance on pre-planned versus on-call air strikes.<sup>33</sup> Obviously, Bradley and Patton wanted on-call strikes available to them. Aircraft being used for something else when they wanted them were virtually worthless to the ground commanders.

The preceding survey of various ground commanders in the North African campaign revealed their desires as far as their priorities were concerned. The two missions they asked for consistently were defensive air cover and close air support. Additionally, they wanted their troops to see friendly aircraft over the battlefield and they wanted faster response times when they called for air support.

The tactical ground commanders' reasoning had to do with the in combat experience in Tunisia, as well as experience in training and their understanding of

contemporary doctrine. For all the allied troops in Northwest Africa, the threat of Axis air attack was very real. It is interesting to note that several of the high ranking ground commanders had personal encounters with axis air attack, and undoubtedly, these experiences colored their perception when they judged the effectiveness of the allied air effort. One example of this was General Omar Bradley. He was personally exposed to a bombing attack by a pair of JU-88s when he was deputy commander of US II Corps. After that, he seemed to criticize the AAF continuously as not being able to keep enemy air off the backs of his troops.<sup>34</sup>

A second example of a ground commander's personal experience with enemy air attack came from General Patton. On 1 April 1942, a pair of Axis bombers, similar to the ones that colored Bradley's experience, attacked an American position and killed three men. One of the dead was Captain Richard Jensen, Patton's favorite aide. Jensen's untimely death enraged Patton, who reflected his displeasure in the US II Corps situation report.<sup>35</sup> Needless to say, the ensuing battle between Patton and the commander of the supporting air force nearly set back Army - Air Force relations 50 years. It is, however, easy to see how that experience affected Patton's perception of the air support he was getting. In his mind, the AAF had different priorities than he did, or they wouldn't have allowed the above mentioned JU-88 attack in the first place.

Major General Fredendall, too, had an unfortunate experience when he was commander of II Corps. In early January, one of Fredendall's battalions had been attacked near Maknassey by JU-87s and taken casualties. Fredendall claimed 300 troops were lost.<sup>36</sup> More than any other event, this attack left an impression on Fredendall. He

dug in his command post and was reluctant to move out of it. This action seemed to develop a defensive fear complex that permeated II Corps.<sup>37</sup> In fact, Eisenhower chided Fredendall about the habit of staying too close to his command post.<sup>38</sup> Although there seem to be conflicting views about the actual damage inflicted on II Corps, it undoubtedly affected his thoughts on air mission prioritization.

In the case of British commanders another possible reason they held the views they did was combat experience they had prior to the Northwest African Campaign. The British 1st Army Commander had been a brigade commander in the unsuccessful Battle of France in 1940. Shortly before Dunkirk, he had been given command of a decimated division. His memories of air were searing ones of fighting on the receiving end of the overwhelming ground support effort of the Luftwaffe and the corresponding and inadequate response of the Royal Air Force.<sup>39</sup> Unfortunately, his initial experiences in Northwest Africa were not very different. His supply ships were sunk at Bongie, his forward lines were dive-bombed incessantly, and the German Air Force maintained air superiority in the early part of the campaign.<sup>40</sup> There's no question that his Tunisian experience combined with his prior experience in France, caused him to prioritize the air defense and close air support missions above all others. His views, no doubt, affected the officers around him and permeated down to the subordinate ground commanders in 1st Army.

The final possible reasoning for the ground commanders' prioritization of air missions, particularly the Americans, has to do with their experiences with close air support in training back in the United States. Although the AAF had paid lip service to

supporting army ground commanders, much of the material (aircraft) and trained pilots were going to the air efforts in England and the Pacific. There were constant shortages of everything in the states, and it showed when the AAF tried to support ground force training there.

Patton and Fredendall both had negative experiences in this regard prior to the North African Campaign. Patton had played a large part in the 1941 Carolina and Louisiana maneuvers, and at the time of his selection for TORCH, commanded the I Armored Corps at the Desert training center. It was during that part of Patton's tenure in the US that Army leaders had become dissatisfied with the support AAF gave them for training.<sup>41</sup> Major General Fredendall had experiences similar to Patton. Fredendall had commanded US II Corps during its train-up in the states. In May, 1942, the AAF had botched a large scale air - ground exercise at Ft Benning.<sup>42</sup> There's no question these training experiences affected the way both Patton and Fredendall thought about the prioritization of air assets. It supported their spoken and unspoken assertions that the airmen's priorities were in the wrong place.

#### V. Air Commanders' Views in the North African Campaign

Turning to the other side of the issue, it must be noted that the airmen attempted, to the limits of their ability, to give the ground commanders what they wanted. As General Anderson's 1st Army stalled in western Tunisia at the end of November, the records show that the allies put up 1500 missions the 3rd week of November, 1942, and 1900 missions the 4th week.<sup>43</sup> Even as late as April, 1943, the airmen were supportive of the ground commanders' decisions. Air Vice Marshall "Mary" Conningham placed the



entire tactical air force, and all the medium bombers from strategic air forces, under the OPCON of British 242 Group. According to 242 Group, they made every effort to fulfill the air requirements of the ground forces.<sup>44</sup> This was contrary to normal air mission priorities, but it demonstrated the air commanders' support for the ground forces.

Clearly, however, air commanders were not meeting ground commanders' expectations. The various air commanders had given the ground commanders everything they wanted, with one big exception -- results! This was important because it fueled the air commanders' argument that the ground commanders' priorities were wrong. The airmen felt that they could give the ground forces the desired result if only they were left alone to prioritize the air support missions. The prioritization that allied air commanders placed on scarce air resources developed at odds with the ground commanders' priorities. The air commanders wanted air superiority missions, then interdiction, and finally, close air support. Even though the air commanders agreed on air support in its proper perspective, they disagreed with the ground commanders on specifics. Air commanders felt that air attack of hard targets (i.e., tanks) was very ineffective and that there were times when the ground forces could take care of themselves in respect to enemy air attack.

Major General Carl Spaatz provides a clear example of the airmen's priority for air superiority and interdiction over close air support. In a letter of March, 1943, to General "Hap" Arnold, Spaatz emphasized that "the air battle must be won first .... Air units must be centralized and not divided into small packets among several armies or corps." There were, in fact, times when Spaatz indicated that close air support was not the best use of airpower, period. According to Spaatz, the best use of air power was to hit enemy

airfields, tank parks, motor pools, and troop concentrations *before* their forces got to the battlefield.<sup>45</sup> It's interesting to note that allied aircraft were bombing and strafing the German Air Force commanders out of their air bases at the same time Patton was complaining about the harassment he was getting from the Luftwaffe.<sup>46</sup> In fact, from mid-April to mid-May of 1943, the Luftwaffe spent most of its time attempting to salvage itself and escape to Italy.

Spaatz's preference for air superiority missions would do two things for the allied force. First, it would keep enemy bombers away from friendly ground forces, thereby eliminating the requirement for air "umbrellas." Second, it would give his aircraft much more freedom to perform the interdiction mission. By emphasizing the interdiction mission, the enemy forces the ground commanders eventually had to face would be greatly weakened. The airmen felt that an unmolested allied ground force should be able to dispatch a weakened enemy ground force. The airmen felt that the ground forces did not need air support for everything.

Besides air superiority and interdiction missions - in that order - the airmen strongly believed that some CAS targets were more amenable to air attack than others. To make matters worse, they seemed to believe that the front-line troops could do a better job defending themselves. Needless to say, this attitude did little to ingratiate the air commanders to their brother ground commanders.

Spaatz articulated this attitude in a 4 February, 1943, discussion with General Truscott, Eisenhower's staff representative at the front. Spaatz claimed that it was a mistake to use up all of one's force in an indecisive operation. The Air Force should be

used to hit the soft parts of the enemy and in return be used to protect the soft part of one's own force.<sup>47</sup> This obliquely shows the air commander's view that aircraft were vulnerable against dug in front-line troops. To the air commanders' way of thinking, the troops could do a better job defending themselves while the aircraft sought more lucrative targets behind the enemy's front line.

Spaatz was more direct about this subject in a discussion with General Fredendall the next day. In that discussion he told Major General Fredendall that the "hard core" of the Army ought to be able to protect itself.<sup>48</sup> In this case, Spaatz is referring to Fredendall's front-line troops. Although Fredendall agreed in principle, it didn't stop him from continuously requesting more air from the supporting air force.

Major General Brereton, the 9th Air Force Commander held a similar view. His air force had helped support the British on their western move toward Tunisia and had generally achieved air superiority and had done an excellent job harassing Rommel as he fled west. In his diary, Brereton writes, "British 10th Corps complained bitterly - apparently some little damage was done [from air attack] to armor going through the barrier [minefield]. The truth is that our troops have been so immune to air attack that they have grown accustomed to complete protection and raise hell when they get a little dose from the enemy."<sup>49</sup> This is slightly more callous than Spaatz's stated opinion, but it shows the air commanders' mental prioritization.

Their reasoning has to do both with theory and the combat experience in North Africa. The air commanders seemed to hold an unshakable faith in the air theories of Douhet and Mitchell from the 1920's. Those theories held that command of the air would

make everything on the surface easier, if it could not win the war by itself. The Air Corps Tactical school at Maxwell Field in Alabama had further distilled those theories into prioritization of air superiority, interdiction, and finally close air support. More important than theory, however, the actual combat of North Africa gave the air commanders reasons for wanting to prioritize the air missions the way they did. Their reasoning was really pretty simple. When the aircraft were employed the way the ground commanders wanted them to be employed, it wore out the air forces without achieving any appreciable gain over the enemy.

Spaatz's discussion with the U.S. II Corps Commander in both January and February shows that he simply could not keep putting up continuous aircover. In January, he told Fredendall that he had "worn out" two fighter groups and a light bombardment squadron in supporting ground troops. Additionally, he could not continue such operations because he didn't have a fast enough replacement system to do so.<sup>50</sup> Spaatz reiterated his reasoning in February. He could not maintain constant umbrellas over one small section of the front. This allowed him only shallow penetration of the enemy's airspace, and because of that, the available air forces would be dissipated without any lasting effect on the enemy.<sup>51</sup>

Air commanders at all levels in North Africa felt that the misprioritization of aircraft by ground commanders was a result of ground commanders not understanding how air really worked. Then-Major Philip Cochran of the 58th Fighter Squadron felt that American losses in close air support missions had resulted from sending up flights of too few planes in attacks on gun positions and patrol over troops. Additionally, Cochran felt

that no protection was provided P-39s and A-20s when it was known they would meet enemy aircraft in superior numbers.<sup>52</sup> Cochran's chiding of the ground commanders use of aircraft was echoed by others.

Brigadier General James Doolittle related a story about a ground commander's request for air that shows his view of the ground commanders misuse of aircraft.

In December of 1942, I had a ground commander ask me to give fighter cover to a jeep that was going out to repair a broken telephone line. I refused. The plane that would have wasted his time on that mission shot down two German ME-109s. If each ground commander had his own "air umbrella" overhead to use defensively, there would have been little or nothing to use offensively.<sup>53</sup>

Both Air Marshall Tedder and General Spaatz had similar convictions on what they felt was misuse (read - "misprioritization") of air power. Tedder felt that aircraft in North Africa were "frittered away in penny packets" by "attacking targets all on the orders of local ground army commanders."<sup>54</sup> Likewise, Spaatz emphasized to General Arnold that "air operating under the command control of a ground officer will most probably be improperly used."<sup>55</sup>

## VI. Review of North Africa Air and Ground Views

A quick review of the ground commanders' thoughts on air support show that they wanted air defense and close air support. Interwoven between the desires for those two missions, the ground commanders wanted their troops to see friendly aircraft overhead, and they wanted faster response time.

It is interesting to note that the ground commanders were concerned with the area around them, or their locality. They wanted *their* troops to see friendly aircraft and the

enemy *in front of them* attacked with close air support missions. Not once in this survey did a ground commander, from Corps on down, ask for air support for anybody else. Anderson did not ask for air defense umbrellas for Fredendall or vice versa. Most telling is BG Robinett's comment that he did not want to see reports or pictures of ships or ports being attacked, but rather aircraft overhead, helping his unit. And although he is the only one that specifically said that, the other ground commanders' thoughts and actions seemed to be similar to Robinett's. The ground commanders were understandably concerned with their locality. They had trouble understanding why all available air could not be provided in their locality, where and when they needed it.

Taking the opposite tack, the air leaders understood that air support was important, but it was only part of the whole theater air mission. In their theater-wide view, the airmen wanted to fly air superiority missions, then interdiction missions, and finally close air support, because in their views that best contributed to the overall success in the theater - they thought it was more effective.

In a manner exactly opposite to the ground commanders, no air commander was concerned with any specific locality on the battlefield, unless it was the main effort. In that case, it had theater-wide implications that the air commanders were very willing to support. Spaatz and other air leaders stated this several times.<sup>56</sup> Moreover, air superiority and interdiction would help everyone in the theater, although their existence would not be nearly as apparent as their absence. The side benefit to these priorities for the air commander was that there was a favorable return for any aircraft attrition that occurred. That favorable return was an appreciable decrease in enemy capability theater-wide.

Control of aircraft was important to both sets of commanders, but not for the sake of control itself. Control was important because it gave the controlling commander the chance to fly air missions according to their desired priorities. It was the argument of local application of air power on one side and the theater wide application on the other that both sides were trying to win. Control simply allowed one side to preempt the other.

## VII. Doctrine Prior to the Gulf War

The doctrine governing air operations, ground operations, and their integration had not improved all that much as war loomed in the Persian Gulf in 1990. The separation of the Air Force into a separate service in 1947 seemed to cement the “love-hate” relationship of the US Army ground and air forces. With the exception of Korea and Vietnam, when necessity demanded a close interface, the two services had developed doctrine almost in isolation from each other.

Of the two services, the Army had done a better job of articulating how it intended to fight. Furthermore, it had envisioned how the Air Force would be integrated into the Army’s vision. Needless to say, the Army’s view almost always subjugated the Air Force to the role of support to the land forces. In the 1986 version of Army FM 100-5, Operations, air power was an integrated, but subordinate element of the air/land concept. Additionally, the Army manual described air operations as fire support to ground maneuver forces.<sup>57</sup> According to this doctrine the only area where the Air Force could become the principle means of destroying enemy forces was in a nuclear conflict. Even in that case, though, air operations were termed, “fire support”, and ground forces would

then exploit the effects of this “fire”.<sup>58</sup> This tended to echo the ground commanders’ ideas from 1943 and certainly did not view the Air Force as an independent and co-equal entity.

For its part, the Air Force’s doctrine prior to the Gulf war was heavy with theory and lessons learned, but short on how it intended to fight. There was not much emphasis on how air power would integrate with army forces. Chapter 3 of AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, listed nine broad missions. These included Strategic Aerospace Offense, Strategic Aerospace Defense, Counter Air, Air Interdiction, Close Air Support, Special Operations, Airlift, Aerospace Surveillance and Reconnaissance, and Aerospace Maritime Operations.<sup>59</sup> The manual did, however, provide a quick acknowledgment of the Army’s air/land concept. It advocated that the Air Force needed to plan and coordinate with surface forces. “Air and surface commanders should take actions to force the enemy into this intense [Air/Land] form of combat with a systematic and persistent plan of attack.”<sup>60</sup> Obviously enough, this manual, unlike the Army’s, did not present the Air Force as being subordinate to any service. In a sense, this manual and Air Force organization showed how fractionalized the Air Force had become. Strategic Air Command had primary responsibility for the Strategic Mission. Tactical Air Command owned the Counter Air, Close Air Support and Air Interdiction missions. Military Airlift Command owned Airlift, and Special Operations had its own niche. At this point in its history, the Air Force would have had a tough time finding a unified position on how it would integrate with Army forces, what its priorities would be if it did, and how those priorities would be weighted.



### VIII. Gulf War Theater Command Architecture

The Command structure for integrating air and surface forces in the Gulf war was relatively streamlined. General Norman Schwarzkopf, the theater commander, received his orders directly from the national command authorities. Schwarzkopf, in turn, centralized his theater air assets under Lieutenant General Charles Horner. In this role, as joint force air component commander (JFACC), Horner was responsible for planning, coordination, allocation, and tasking, based on the joint force commander's (Schwarzkopf's) decisions for weighting the theater air effort.<sup>61</sup> Schwarzkopf could have placed an overall joint force land component commander (JFLCC) between himself and his two primary ground commanders, as well. These latter were Lieutenant General John Yeosock, commander of 3rd Army, and Marine Lieutenant General Walter Boomer, commander of the Marine Expeditionary Force (MEF). Interestingly, Schwarzkopf elected to retain the role of land component commander in addition to his role as Theater CINC.<sup>62</sup> This structure would remain in place throughout the conflict.

While this structure was both stable and workable, it was not without its challenges. The first challenge was that Schwarzkopf, as both the JFLCC and the theater CINC, could and would put Horner in sticky situations with subordinate ground commanders and with Schwarzkopf himself. Horner anticipated the latter problem. He explained to Schwarzkopf that he [Horner] might become "gnarly" with Schwarzkopf at times because as the air component commander, he would sometimes "have legitimate disagreement with what the land component commander wants to do."<sup>63</sup>

The animosity that Horner would feel from the various subordinate ground commanders was probably more of a surprise to him. This resulted because Schwarzkopf, as the CINC, would make air targeting and priority decisions and relay them through Horner for execution without keeping his subordinate ground commanders informed. This made sense to Schwarzkopf, because as both the CINC and the JFLCC, he understood his own reasoning.<sup>64</sup> This often left the ground commanders in the dark, and they often shifted the blame for air priority decisions onto Horner.

A second challenge to this command architecture was that theoretically the JFACC would control all of the air assets in theater. This worked well through Horner's Air Force "glasses," but not as well with the air arms of the Army, Marines, and Navy. More so than in the Air Force, the other services' air arms had evolved into particular niches to support their respective services. The Army, Marines, and Navy had come to rely on their aircraft for their service peculiar requirements, and did not want to relinquish them to a theater air commander. Compromises had to be worked out in each case. Overall, however, the Gulf war command structure started and remained a centralized one -- not hard because Horner commanded directly most available attack assets.

#### IX. Ground Commanders' Views in the Gulf War

Unlike the ground commanders in the North African theater who were concerned with two air support missions - air defense and close air support within their locality - the ground commanders in the Gulf were concerned primarily only with air support against enemy ground forces in their zone. Correspondingly, they tended to value interdiction

that directly affected their area more than strategic attack, and value CAS more than they did interdiction.

It would be unfair, however, to say they were not concerned with air defense. Schwarzkopf had badgered General Horner throughout Desert Shield to “guarantee me that not one airplane is going to get through your defense net.” Horner bravely replied that “not one airplane will get through, you don’t have to worry about that.”<sup>65</sup> Horner’s prediction proved to be true as the coalition’s subsequent air supremacy campaign made air defense a “non-problem” for the ground commanders. And as a non-problem, it tended to be taken for granted by them.

The question of weighting the air effort against strategic and deep interdiction targets on one hand, and ground commanders’ concerns on the other, plagued the campaign from planning to finish. The air commanders tended to believe that strategic and interdiction targets were the air component’s problem, whereas the ground commanders felt that the ground component needed more say in the interdiction campaign in so far as it would contribute to their final success. The initial offensive air plan developed by Air Force Colonel John Warden and his Checkmate staff at the Pentagon emphasized strategic attack. Although some of Iraq’s fielded forces would be targeted - particularly the Iraq strategic air defense system and offense systems - none of the occupying forces in Kuwait would be attacked because they just did not seem like “practical targets.”<sup>66</sup> It was over exactly this point - how much destruction of enemy army is required - that controversy swelled up over the initial plan. General Colin Powell was concerned for the same reason. He wanted the Iraqi ground troops in Kuwait attacked as

well.<sup>67</sup> Army ground commanders were not the only ones concerned with the initial plan. The Marines were also wary of using aircraft to attack Iraq strategically at the expense of striking Iraqi military in Kuwait.<sup>68</sup>

The theater operational plan eventually melded into four phases. The phases were: 1) strategic air attack against Iraq, 2) attaining air superiority, 3) battlefield prep in the KTO, and finally, 4) a ground offensive campaign that would eject the Iraqis from Kuwait. As the coalition achieved specific objectives, the emphasis of the air attack was to shift toward the attrition of Iraqi military forces in Kuwait. Schwarzkopf directed that phase 4 would begin when air attacks had reduced Iraqi combat effectiveness in the KTO by 50 percent.<sup>69</sup> Measuring 50 percent effectiveness and deciding which specific targets to attack in the KTO proved hard to do.

As the phased operation moved into execution 16 January 1991, there was little complaint from ground commanders that their targets were not being attacked. This was most likely due to the fact that ground commanders were concerned more with redeployment and build-up of their own forces than they were about servicing targets in front of them. Additionally, the Air Force was providing a fair amount of assistance in the form of airlift for the XVIII and VII Corps move to the west during the first two weeks of the strategic campaign. This, coupled with the Air Force's success at achieving air superiority, kept the air commander on the good side of the ground commanders. Besides, the ground commanders understood that target priorities for the Air Force would be shifted to enemy forces directly in front of them as the time for the ground attack got closer. The question would be "when" and "how much" for the shifting of those priorities.

As the air attacks continued, and the ground commanders finished preparations of their own forces, they began to focus more attention on the enemy forces in front of them. With this new focus they began to be concerned that the air attacks were not preparing the battlefield as much as they wanted. This was unanimous among both Marine and Army ground commanders. Lieutenant Generals Walter Boomer, John Yeosock, Gary Luck, and Fred Franks all expressed major concern over apportionment of air power to support their forthcoming attacks on the Iraqi front.<sup>70</sup> They understood that strategic targets, command and control nodes, and airfields were being hit, but in their view, enemy ground forces were being neglected.<sup>71</sup> This view tended to be more myopic, the farther down the chain they were from the theater CINC. The commanders of the Army XVIII and VII Corps, who had no air forces of their own, seemed to feel the strongest about this.

To exacerbate the problem, the Air Force wasn't the only service to have new technology. The Army did too. The Army's new technology allowed commanders to look deeper into the battlefield than any ground commander had ever done before.<sup>72</sup> But while the Corps Commanders could look deeper than before, their responsibility for their local corps areas had not increased. Indeed, the theater deception plan further restricted them. The corps commanders still looked at obstacles directly in front of them within their area, then focused their attention on obstacles and forces that were a day or two farther away, but still within their area of responsibility. For the Corps commanders, air power was a form of flying artillery and should be available to support their attack in accordance with their priorities.<sup>73</sup> If it was being used somewhere else, it was not helping them.

This perceived failure of air power (read, Air Force) to shift its priorities from theater interdiction to tactical preparation soon had the Army corps commanders asking for help from their higher headquarters, 3rd Army. 3rd Army began to build its case. All along, ground commanders had been following the air targeting procedures. They had submitted their lists of targets through 3rd Army, and 3rd Army had passed them to the air commanders. But of the 1,185 targets that the Army nominated by 31 January, only 202 (17 percent) had been included in the ATO. Of those 202, only 137 (12 percent of total nominations) had actually been hit.<sup>74</sup> This precipitated 3rd Army situation reports on the 14th, 16th, and 18th of February that were very direct in stating that the local ground commanders concerns were not being addressed by the air commanders. They were all very similar in content. The SITREP of the 18th follows:

Air support related issues continue to plague final prep of combat operations and raise doubts concerning our ability to shape the battlefield prior to the initiation of the ground campaign. Too few sorties are made available to VII and XVIII Corps. And while air support missions are being flown against first echelon enemy divisions, Army nominated targets are not being serviced.<sup>75</sup>

These complaints never went away. Between 20 and 24 February, Army corps commanders complained as before that insufficient sorties were attacking Iraqi front-line divisions. The Army ground commanders wanted maximum fire power concentrated on targets immediately in front of them.<sup>76</sup> As far as the Army was concerned, the priorities had not been shifted as much as possible.

The corps equivalent commander in the Marine Corps, Walt Boomer, had similar concerns that air power was not being prioritized properly in his locality. Twelve days

into the air campaign, he directed that Marine aircraft would only attack targets which had impact on MEF concept of operations.<sup>77</sup> This decree resulted because a previous Air Tasking Order (ATO) had ordered a Marine air strike on a scud rocket motor plant near Baghdad.<sup>78</sup> This was not the focus of the MEF commander. As a further step, twenty two days into the air war, he directed that the Marine air wing would only give priority to targets in immediate Marine frontage.<sup>79</sup> Ground commanders in the Marines, like the Army, were concerned that air power was being used beyond their locality, and did everything they could to stop it from doing so. Because Marine air frames were only a fraction of the theater air assets, General Horner allowed this challenge to his authority to pass.

#### X. Air Commanders' Views in the Gulf War

With the question of centralization of air power settled at the beginning, airmen in the Gulf conflict had more freedom to shape the conduct of the war than any airmen before them had had. With this freedom, they quickly showed their preference for strategic attack over attacking the fielded Iraqi army. This was true in the planning phase as well as the execution phase of the air campaign. In some instances, airmen would resort to means that the ground commanders felt were not entirely honest to achieve those ends. There is also some evidence that the airmen felt the ground commanders unable to properly select targets. In the end, however, because they were centrally subordinated to the CINC, they would do what he directed. Strangely, that same command structure was the largest inhibitor to a common understanding between the air and ground commanders.

The importance of strategic attack to the airmen was evidenced during the planning phase of the air campaign. The primary architect of the offensive air campaign was Air Force Colonel John Warden. Although his plan was later modified to account for ground commanders concerns, he initially delegated attacks to Iraqi ground forces to a later phase of the strategic plan. Using the classical airman's logic, Warden argued that attacking ground forces would remove assets from strategic missions, thus diluting his planned attacks on command and control and Iraqi strategic air defense systems.<sup>80</sup> Brigadier General "Buster" Glosson, Horner's primary targeteer, had similar thoughts. He also liked the idea of taking the war directly to Baghdad and striking deep into Iraq rather than focusing on bombing troops in the field.<sup>81</sup> This favoring of strategic targets over tactical targets did not go away after the planning phase, either.

Strategic attacks remained important to the airmen during the execution of the air campaign. Unlike the ground commanders who wanted obstacles swept from their path first close to their positions, then farther away, the air commanders believed isolating the Iraqis was a better way to use the available sorties. In the airmen's view, isolation applied to Iraqi's in the fielded forces as well as civilians throughout the country. General Glosson prioritized leadership, Iraqi communications, power and oil facilities in an attempt to achieve this isolation. He wanted "to put every household in an autonomous mode and make them feel they were isolated." "I wanted to play with their psyche."<sup>82</sup> Lieutenant Colonel Dave Deptula, a CENTAF staff officer, explained the airmen's desire to send a signal to the Iraqi people in another way. "Hey, your lights will come back on as soon as you get rid of Saddam."<sup>83</sup>



This propensity for strategic attack against leadership carried the airmen to expend sorties rather unsuccessfully in some cases. At least twice, F-15E's and F-117s were dispatched on short notice to attack facilities that were believed to house Hussein.<sup>84</sup> Additionally, several attacks by F-111F's were carried out for the purpose of killing the top Iraqi ground commander in Kuwait.<sup>85</sup> In neither case were the missions successful. While isolating Iraqi leaders by cutting off power was one thing, attempting to hunt them down from the air was much harder and used sorties that could have been used elsewhere. It serves to show the airmen's desires for strategic attack, however.

In fact, airmen were accused of resorting to less than honest means of influencing the CINC to continue with strategic attack, even after the ground commanders were clamoring for aircraft closer to their lines. In one case, Lieutenant General Waller, the vice CINC, recalled that General Glosson would use a very small briefing board in the daily briefing to Schwarzkopf that only Schwarzkopf and a few other senior officers in the front row could see. Afterwards, Glosson would come out of the meeting saying "the CINC wants this or that done."<sup>86</sup> His attitude seemed to be that he was doing exactly what the CINC wanted, if the CINC *really* knew what to ask for. Needless to say, the ground commanders felt Glosson was stealing sorties from them so he could use them for strategic attack.

Glosson also tried to circumvent orders to halt strategic bombing in downtown Baghdad after the Al Firdos episode. Al Firdos was an Iraqi command bunker that the Iraqi's were also using as a civilian shelter.<sup>87</sup> It's destruction by two F-117s and the ensuing CNN footage of dead Iraqi civilians put the brakes on strategic attack in Baghdad.

To keep the deep attacks going, Glosson, at the behest of his planners, drew a three mile ring around the center of Baghdad on a map. After that, he declared that everything outside the ring was targetable.<sup>88</sup>

Even in the last few days prior to the ground war, airmen were still trying to get support for deep strategic attacks vice tactical targeting in the KTO. Warden and his checkmate planners in the Pentagon urged CENTAF to re-examine the allocation of air effort between the strategic portion of the air campaign and the KTO.<sup>89</sup> Warden also managed to get an audience with the Secretary of Defense over this issue, but to no avail.<sup>90</sup> Although Warden was neither in Saudi Arabia, nor a commander, his actions provide an example of the importance of strategic attack to the Air Force community.

Another area concerning the strategic use of aircraft was Scud hunting. The effects of Iraqi Scud attacks were more political than military, but still required the air commanders to siphon resources that could have been used on either other strategic targets or the Iraqi army. In an effort to keep Israel out of the war, the Secretary of Defense put pressure on CENTCOM to increase both attacks on fixed Scud missile sites and airborne Scud-patrol.<sup>91</sup> The effects of these missions have never been precisely determined, but by the end of the war, 1,460 sorties had been used to attack, or hunt for, Scuds. These include 20 percent of the F-15E sorties, 2 percent of the A-10 sorties, 4 percent of the F-16 sorties, and 3 percent of the F-111F sorties.<sup>92</sup> In addition, airborne surveillance and national intelligence assets had to be diverted to support the overall effort. These may not have been priorities for which the air commanders knew initially they would have to resource, but circumstances dictated these priorities for them. These

priorities also limited the aircraft available for battlefield preparation as it began to seem critical to ground commanders.

In addition to the airmen's desire to prioritize strategic attack over tactical targets, there is some evidence that suggests the airmen felt that the ground commanders did not know what they were requesting or what the best targets were for air attack. Of the forty-two targets VII Corps nominated on 31 January 1991, only 6 were valid, in the airmen's view. The rest fell into three other categories. They were believed to have been successfully attacked or no longer required (outdated), or they had been attacked and were awaiting assessment (BDA), or they were inappropriate interdiction targets (primarily infantry).<sup>93</sup> In the airmen's view, if the corps would have had control over the aircraft, valid targets would have been missed in favor of the Corps desires. To the airmen, the fact that the Army wanted dug-in infantry attacked reflected a classical airman's complaint -- ground commanders do not know how to use aircraft. The fact that the corps was still requesting outdated or un-assessed targets was not the corps' fault, but more so the command structure and lack of information flow.

More than anything else, the misunderstanding between the air and ground commanders resulted from the command structure explained previously. Although the air commanders obviously had views on how to employ air power, and exerted much energy in attempts to achieve their ends, they had to do what the CINC wanted done. This included providing air support not only for all US ground forces, but coalition ground forces as well. It is important to note here that sorties were flown against Iraqi army forces from the first day of the campaign until the end of the war. More importantly, 56

percent of all sorties flown were specifically against the Iraqi surface forces.<sup>94</sup> If the sorties for air superiority are included, the percentage goes up to nearly 75.

Unfortunately, the ground commanders could not get specifically what they wanted, and tended to blame the air commanders.

Two specific problems appear here, both having to do with Schwarzkopf not clearly communicating his desires and actions. The first problem had to do with General Schwarzkopf's tendency to speak directly and informally to General Horner about targeting priorities. With this information, General Horner would translate his commander's desires into the targeting plan.<sup>95</sup> Although this made sense to both Schwarzkopf and Horner, Schwarzkopf never appears to have communicated his priorities to his ground commanders. As a result, the ground commanders watched the Air Force seemingly ignore their target nominations.<sup>96</sup> The second problem was that Schwarzkopf's priorities in regard to Iraqi Army forces were different than the tactical ground commanders. While the ground commanders were concerned with first echelon enemy forces directly in front of them, Schwarzkopf directed Horner to concentrate initially on second and third echelon Iraqi forces. These were the heavy divisions and the Republican Guards who made up the operational and strategic reserve.<sup>97</sup> With no information from the CINC on how or why he was using airpower to shape the entire theater, the ground commanders had only the Air Force to blame.<sup>98</sup> Horner, on the other hand, went after the CINC's targets full force, and reminded his subordinates not to be diverted from the main effort, the Republican Guard.<sup>99</sup>

So, while the air commanders had definite views on how to prioritize air assets, they were also subordinate to an overall theater commander. In this regard, they did just about exactly what he asked. It must have been disorienting for them to receive the accompanying anger of the ground commanders without understanding exactly why.

#### XI. Review of Gulf War Ground and Air views

This survey of the Gulf war demonstrates that the ground commanders were concerned primarily with the air attack of enemy ground forces directly in front of their units. They were not unconcerned with air defense, but as the war unfolded, it just was not an issue. The ground commanders' concern with air attack of enemy forces in front of them started in the planning phase and continued with increasing intensity all the way up to the ground war.

The ground field commanders failed to see why more of the available airpower was not being applied against forces in their immediate battle area. The MEF commander as well as the commanders of VII and XVIII Corps knew air power was available but was being applied outside their locality. All the ground commanders went about attempting to fix their perceived problem. Because they did not have their own Air Force, the Army Corps commanders funneled their desires through 3rd Army. 3rd Army, in turn, communicated the ground commanders' priorities in their SITREPS to the CINC. The Marine commander, however, did have his own aircraft available. Because of this, he increasingly chose to use them in his specific area of responsibility and restrict their use in broader theater-wide missions, in spite of the CINC's guidance to the contrary.

On the air side of the house, this survey demonstrates that the air commanders tended to have a preference for theater-wide application of strategic airpower. Brigadier General Glosson and Colonel Warden's attempts to continue strategic attack even after the CINC had started emphasizing tactical targets show this. In the end, however, since they were centrally controlled by the CINC, the airmen complied with his direction. The statistics show the majority of all sorties were flown against the Iraqi army.<sup>100</sup>

Even so, there were still squabbles about specific targets within the ground commanders' tactical target sets. These ended up being a problem with communication between the CINC and his field commanders. It is ironic that the centralized air command structure that allowed the airmen to prioritize their missions and do what the CINC required, gained them ill will from the ground tactical commanders. This is partly because the ground commanders were unaware of all the CINC's priorities and partly due to a certain mistrust between the two services. When all the chaff of miscommunication is removed, however, the air commanders tended to have a theater-wide view.

Control of aircraft was not an issue between the Army and the Air Force. The centralization concept was so entrenched that the Army commanders simply weren't going to get it. With the control issue removed between the Army and Air Force, it is easier to see that the real argument had to do with the degree of prioritization between the field commanders' local requirements on one hand and the air commanders' (and CINC's) theater-wide view on the other. This argument was mediated by guidance provided by the theater commander who remained, after all, ground component commander as well. Control was an issue between the Air Force and Marines. It clouded the central argument,

but the Marine ground commander showed his desire for tactical (local) targets by restricting Marine aircraft from being used on theater-wide missions.

## XII. Comparative Analysis of the Two Case Studies

Although there are similarities between the North African Campaign and the Gulf war nearly forty-eight years apart, there several differences. The first difference is that the ground commanders in North Africa had air commanders uniquely responsible to them for support. Although these airmen did not exercise full control over employment of the assigned aircraft, because control over aircraft tasking was centralized, they did handle the concerns of the supported ground commander. This gave the ground commanders a direct conduit to the air forces. If nothing else, it gave the ground commander someone to complain to, or at least find out why air support was not exactly to his liking. Conversely, although the air forces were also centralized in the Gulf, there was no air commander assigned to a specific major ground commander. This tended to leave the ground commanders without a method of communication to the air forces, save that of badgering their higher Army headquarters, which proved unsatisfactory.

The second and third differences are related. The second is that the ground commanders in the Gulf War did not have to demand air defense missions. They enjoyed air supremacy throughout and tended to take it for granted. The third is that the air commanders in the Gulf did not have to stress their desires for air superiority, interdiction, and then close air support, nearly as much as did the air commanders in North Africa. These differences tend to emerge because the command structure in the Gulf was unlike that in the North African Campaign. This is subtle, but important. In the North African

Campaign, the command structure evolved from a decentralized to a centralized structure in a period of about four months, for both ground and air forces. The resulting confusion about who controlled air assets contributed directly to the argument for an air defense umbrella. In North Africa, when their own troops were attacked by enemy air, the ground commanders wanted constant air defense missions over their troops' positions. This, in combination with the poor logistics setup, wore down the allied air forces. The degraded allied air forces, in turn, were less able to defend against Axis air attack. This led the ground commanders to request even more air defense missions from an already degraded air force. The employment of available aircraft was later centralized, but the damage was done until the air commanders could replace equipment and crews.

On the other hand, the centralized command structure in the Gulf, although not perfect, remained consistent. This, combined with the fact that the air forces arrived in the Gulf in force long before the army was ready to attack, allowed air commanders to concentrate on defensive counterair and plan an effective offensive counterair campaign. The centralized command structure in the Gulf, implemented from the beginning, resulted in the biggest differences between the North African Campaign and the Gulf war. Had ground commanders in the Gulf successfully demanded air priorities be diverted to tank plinking and permitted survival of an enemy offensive air threat, the success of the Third Army displacement to the west would have been problematic at best.

Even though the ground commanders did not have to deal with enemy air attacks, there are still striking similarities between the two cases. These similarities revolve around doctrine and the argument between the ground commanders' demand for support in their



locality on one side, and the air commander juggling that with a theater-wide view on the other.

Though the doctrine was not exactly the same, it had the same effect on air and ground commanders in the two case studies. In the North African campaign, FM 35-31 allowed the ground commanders to view any available air power as a possible addition to their combat power. The slow, rough going of the North African Campaign caused the ground commander to invoke that view very quickly. Similarly, during the Gulf War, Army officers mentally carried their AirLand Battle doctrine with them. In that case, they viewed air power almost totally as a fire support system that would assist them in achieving their ground maneuver objectives. Although the voicing of that thought process began as a slow burn that gradually boiled over, it was definitely part of the ground commanders' thought process. On the other hand, the doctrine for the airmen in both case studies allowed them to view air support of ground forces as a vital part, but only a part, of the whole theater-wide view they held. The doctrine had loopholes that allowed both parties to see the world their way. It provided a glimpse of the friction that would occur in each case.

Once the combat started, the ground commanders in both case studies became very concerned with the use of air within their area of responsibility and their area of interest. In both cases, they wanted more air support than they were getting. In not one instance, in either case, did a field ground commander ask for air support with a theater-wide view in mind, or even for another ground commander. In the North African Campaign, they wanted both air defense and close air support within their local area. In

the Gulf war, the ground commanders only wanted close air support and interdiction, but again, only as it affected their area of interest. This makes perfect sense when viewed from their position, but it hasn't changed in nearly fifty years.

Likewise, there is a common theme among the air commanders in these two cases. First of all, the air leaders tried to the best of their ability to give the ground forces the things they asked for. In the North African case, they did this almost to the detriment of the air forces they commanded. In the Gulf war, they did the same, but it was through the CINC's guidance, and not always to the desires of the subordinate ground commanders. More importantly, the views of the air commanders tended to diverge from the views of the ground commanders. The air commanders had to balance the desires of the ground commanders against the theater-wide view that included strategic attack and interdiction. In both cases, the air commanders were concerned with helping everyone in theater, as opposed to specific localities. Finally, the air commanders in both cases were managing a finite amount of air resources while trying to accomplish their mission and keep all parties happy.

### XIII. Conclusions

Overall, the similarities between the North African Campaign and the Gulf war between ground and air commanders are very striking. Also striking is the lack of coherent doctrine on how ground and air commanders were to integrate their respective forces as they transitioned from peace to war. Nearly fifty years of technological and organizational advancement has not really changed the attitudes on the importance of the ground commander's local versus the airman's theater responsibility. The two case

studies show that these attitudes do not change much in peacetime or under the pressure of combat.

It's interesting to note that, on the surface, it looks as if the argument is between the Army and the Air Force. In actuality, officers of any service who had theater-wide responsibilities tended to develop a theater-wide view. Conversely, officers with local responsibilities developed parochial attitudes for their local area. Both Eisenhower and Schwarzkopf tended to have wider theater focus than did their subordinate ground commanders. What transpired in reality, as the two case studies show, is that the air commander (an airman) was given theater responsibility while ground commanders (generally army officers) below CINC level had more localized responsibility. The clash tended to occur here, between the differing viewpoints, not between services. It just *looks* like an inter-service fight. There is some systemic validity to the perception, however.

The perception of a service argument will probably persist. In the two case studies, aircraft were the primary weapons both kinds of commanders required to fulfill their respective responsibilities. They were scarce resources that could be used anywhere in the theater. Accordingly, the theater commanders in each case centralized them. This will most likely occur with any weapon that is in short supply and has theater-wide applicability. It has already occurred with cruise missiles in the Gulf war, and may be the case with ATACMS if their range and effects increase much more. But for now, and into the first decades of the twenty first century, aircraft will most likely be the primary theater weapon. The argument and competition for scarce resources between local responsibility

and theater responsibility will continue, and it will appear to be between the Army and the Air Force.

This paper would be without value if current and probable commanders could not apply lessons to situations they will face in the future. It's a safe assumption that commanders in the future will have attributes similar to the commanders in these two case studies. It is also safe to assume that the differing viewpoints will still be prevalent. With that in mind, this paper brings to light some conclusions for both air and ground commanders to think about when they work with the "other side."

First of all, core values will be just beneath the surface. Core values aren't easily changed, nor are military officers of any service likely to shirk the responsibility they are given, particularly in combat. The consequences of life and death, victory and defeat, weigh heavily on each type of commander. They are not likely to agree with any decision that may limit the effectiveness of their respective commands. No one should expect them to.

The second point is related to the first. Although neither side fully appreciates the view of the other, each side knows the other has one. With this knowledge, the natural intellectual leap is that the other side has some kind of agenda. This, coupled with limited knowledge about how the other side does business, will make each side feel that the other may be doing something on purpose that will affect them negatively. A certain amount of mistrust is bound to crop up, and if not controlled, will result in deteriorating relationships between the two sides. This needs to be avoided as much as is humanly possible.

Also, the air commanders need to be aware that simply centralizing the aircraft control structure does not settle the argument. The North African command structure centralized aircraft control very early, and the Gulf structure centralized it from the beginning. It did not stop the argument. The air commanders must understand that the ground commanders instinctively feel that if they do not control a resource, they will not be allowed to use it. The ground commander feels like he's dangling by a thread, and no one above his level will expend too much effort to help him. Too often air commanders believe that centralization will make everyone happy and miss the real concerns of the ground commander. They mistake the ground commander's demands for resources in his local area as simple service parochialism.

Each contingency situation will be different. This includes the overall strategic goals, the military objectives, the geography, and the size of the available forces. Still, the different viewpoints common to both case studies will most likely be present. This puts the onus on the commanders to work out an acceptable solution in each case. Like the commanders in North Africa and the Gulf, they will be masters of their chosen professions, but less well equipped to deal with the challenges of integrating land and air forces. The doctrine will probably not be much help. Understanding the issues of the different viewpoints should make both types of commanders more capable of discharging their professional duties.

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<sup>1</sup> Daniel R. Mortensen, A Pattern for Joint Operations: World War II Close Air Support, North Africa, (Office of Air Force History and US Air Force Center of Military History Study, 1987), 12.

<sup>2</sup> Ibid., 12.

<sup>3</sup> Ibid., 21.

<sup>4</sup> Ibid., 20.

<sup>5</sup> Westly F. Craven and James L. Cate, eds., Europe: TORCH to Pointblank: August 1942 to December, 1943, Vol II of The Army Air Forces in World War II, (Chicago, Ill.: University of Chicago Press, 1949), p. 137.

<sup>6</sup> George F. Howe, UNITED STATES ARMY IN WORLD WAR II; The Mediterranean Theater of Operations. Northwest Africa: Seizing the Initiative in the West, (Washington DC: Office of the Chief of Military History, 1957), p. 35-6.

<sup>7</sup> Craven and Cate, Europe: TORCH to POINTBLANK, 53-55.

<sup>8</sup> Howe, Northwest Africa, 351.

<sup>9</sup> Mortensen, Pattern for Joint Operations, 63-64.

<sup>10</sup> Howe, Northwest Africa, 383.

<sup>11</sup> Ibid., 384.

<sup>12</sup> Ibid., 383.

<sup>13</sup> Richard G. Davis, Tempering the Blade: General Carl Spaatz and American Tactical Air Power in North Africa, November 8 1942 - May, 1943, (Washington DC:, Office of Air Force History, 1989), 72.

<sup>14</sup> Howe, Northwest Africa, 485-94.

<sup>15</sup> Davis, Tempering the Blade, 78.

<sup>16</sup> Mortensen, Pattern for Joint Operations, 59.

<sup>17</sup> Davis, Tempering the Blade, 35.

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<sup>18</sup> Mortensen, Pattern for Joint Operations, 61.

<sup>19</sup> Ibid.

<sup>20</sup> Arthur W. Tedder, With Prejudice: The War Memoirs of Marshal of the Royal Air Force, (Boston: Little, Brown, and Company, 1966), 386.

<sup>21</sup> Omar N. Bradley and Clay Blair, A General's Life: An Autobiography by General of the Army Omar N. Bradley, (New York: Simon and Schuster, 1983), 143.

<sup>22</sup> Benjamin F. Cooling, ed., Case Studies in the Development of Close Air Support, (Washington, DC: Office of Air Force History, US Air Force, 1990), 169.

<sup>23</sup> Ibid.

<sup>24</sup> Davis, Tempering the Blade, 74.

<sup>25</sup> Craven and Cate, Europe: TORCH to POINTBLANK, 169.

<sup>26</sup> Cooling, Case Studies, 169.

<sup>27</sup> Mortensen, Pattern for Joint Operations, 61.

<sup>28</sup> Cooling, Case Studies, 165.

<sup>29</sup> Ibid., 169.

<sup>30</sup> Davis, Tempering the Blade, 117.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid., 116.

<sup>33</sup> Ibid.

<sup>34</sup> Richard P. Hallion, Strike from the Sky: The History of Battlefield Air Attack 1911 - 1945, (Washington DC: Smithsonian Institution Press, 1989), 175.

<sup>35</sup> Cooling, Case Studies, 177.

<sup>36</sup> Fredendall's estimates of air attack casualties were evidently high, although they did affect his perception of what was happening in the air. Gen Spaatz's later discussions with a BG on Fredendall's staff indicated that the one experience that colored Fredendall's thinking was the result of an incompetent battalion commander moving his vehicles

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bumper to bumper in daylight. The BG, Ray Porter, felt that the troops could learn to take care of themselves during dive bomb attacks, but that the defensive complex was taking over the II Corps. For Casualty statistics, see Cooling, Case Studies, 167. For BG Porter's discussion, see Davis, Tempering the Blade, 75.

<sup>37</sup> Davis, Tempering the Blade, 75.

<sup>38</sup> *Ibid.*, 67.

<sup>39</sup> *Ibid.*, 69.

<sup>40</sup> *Ibid.*, 67.

<sup>41</sup> *Ibid.*, 65.

<sup>42</sup> *Ibid.*, 66.

<sup>43</sup> Mortensen, Pattern for Joint Operations, 59.

<sup>44</sup> Davis, Tempering the Blade, 104-5.

<sup>45</sup> Cooling, Case Studies, 169.

<sup>46</sup> Craven and Cate, Europe: TORCH to POINTBLANK, 175.

<sup>47</sup> Davis, Tempering the Blade, 73.

<sup>48</sup> *Ibid.*, 74.

<sup>49</sup> Lewis H. Brereton, Lt Gen, US Army, The Brereton Diaries: The War in the Air in the Pacific, Middle East, and Europe, 3 October 1941 - 8 May 1945, (New York: William Morrow and Company, 1946), 161.

<sup>50</sup> Cooling, Case Studies, 169.

<sup>51</sup> Davis, Tempering the Blade, 74.

<sup>52</sup> Cooling, Case Studies, 168.

<sup>53</sup> General James H. "Jimmy" Doolittle, I could Never Be So Lucky Again, (New York: Bantam Books, 1991), 327.

<sup>54</sup> Cooling, Case Studies, 167.



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<sup>55</sup> Davis, Tempering the Blade, 127.

<sup>56</sup> Spaatz and his staff spent much of their time from November, 1942 through April, 1943, visiting various ground commanders' headquarters attempting to determine the exact problems and implementing solutions that made sense to everyone. Often, however, there was not a "meeting of the minds." Davis, Mortensen, and Cooling all site these visits.

<sup>57</sup> United States Army Field Manual (FM) 100-5, Army Operations, May 1986, 43.

<sup>58</sup> FM 100-5, Army Operations, 1986 Version, 43, 22-32.

<sup>59</sup> United States Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force, April, 1984, 3-2.

<sup>60</sup> AFM 1-1, Basic Aerospace Doctrine of the USAF, 1984 Version, 2-14.

<sup>61</sup> James A. Winnefeld and Dana J. Johnson, "Unity of Control: Joint Air Operations in the Gulf," Joint Force Quarterly, (Summer 1993, No. 1) 92.

<sup>62</sup> Edward C. Mann, Thunder and Lightning: Desert Storm and the Air Power Debates. (Montgomery, AL: Air University Press, 1995) 56.

<sup>63</sup> Ibid.

<sup>64</sup> Ibid.

<sup>65</sup> Norman H. Schwarzkoph and Peter Petre, It Doesn't Take a Hero, (New York: Bantam Books, 1992) 351.

<sup>66</sup> Mann, Thunder and Lightning, 60.

<sup>67</sup> Michael R. Gordon and General Trainer, The General's War: The Inside Story of the Conflict in the Gulf, (Boston: Little, Brown and company, 1995) 84.

<sup>68</sup> Gordon and Trainer, The General's War, 311.

<sup>69</sup> Mann, Thunder and Lightning, 65.

<sup>70</sup> Eliot A. Cohen, director, Gulf War Air Power Survey, Vol. VI Summary Report, (Washington: Department of the Air Force, 1993) 152. (Referred to as GWAPS from this point forward)

<sup>71</sup> Winfield and Johnson, "Unity of Control: Joint air Operations in the Gulf," 98.

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- <sup>72</sup> Gordon and Trainer, The General's War, 311.
- <sup>73</sup> Ibid.
- <sup>74</sup> Ibid.
- <sup>75</sup> Richard M. Swain, "Lucky War." Third Army in Desert Storm, (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1991) 188.
- <sup>76</sup> Cohen, GWAPS, Vol. II, Operation and Effects and Effectiveness, 294.
- <sup>77</sup> Gordon and Trainer, The General's War, 503.
- <sup>78</sup> Ibid., 321.
- <sup>79</sup> Ibid., 503.
- <sup>80</sup> Gordon and Trainer, The General's War, 89.
- <sup>81</sup> Ibid., 96.
- <sup>82</sup> Ibid., 314-15.
- <sup>83</sup> Ibid.
- <sup>84</sup> Cohen, GWAPS Vol. II, Operations, 241.
- <sup>85</sup> Gordon and Trainer, The General's War, 314.
- <sup>86</sup> Ibid., 321.
- <sup>87</sup> Cohen, GWAPS Vol. II, Operations, 206.
- <sup>88</sup> Gordon and Trainer, The General's War, 327.
- <sup>89</sup> Cohen, GWAPS Vol. II, Operations, 291.
- <sup>90</sup> Ibid., 243.
- <sup>91</sup> Gordon and Trainor, The General's War, 232.
- <sup>92</sup> Cohen, GWAPS Vol. II, Operations, 189.

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<sup>93</sup> Daniel P. Leaf, Unity of command and Interdiction, (Montgomery Al: Air University Press, 1994), 75.

<sup>94</sup> Cohen, GWAPS Vol. II, Operations, 341.

<sup>95</sup> Leaf, Unity of Command and Interdiction, 70.

<sup>96</sup> Cohen, GWAPS Vol. II, Operations, 268.

<sup>97</sup> Cohen, GWAPS Vol. VI, Summary Report, 152.

<sup>98</sup> United States Department of Defense, Conduct of the Persian Gulf War: Final Report to Congress, Vol. 1 (Washington, DC: Department of Defense, April 1992) 345.

<sup>99</sup> Cohen, GWAPS Vol. II, Operations, 268.

<sup>100</sup> Cohen, GWAPS, Vol. II, Operations, 269.

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