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**NAVAL WAR COLLEGE
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**THE TAIPEI AIRLIFT:
OPERATION VITTLES AS A FRAMEWORK FOR COUNTERING A PEOPLE'S
REPUBLIC OF CHINA BLOCKADE OF TAIWAN**

by

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LT USN

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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24 April 2008

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Abstract

A Joint Force Commander tasked with countering a People's Republic of China (PRC) total blockade of Taiwan would have a difficult challenge. The PRC has wisely invested in anti-access technologies that make it risky for us to conduct operations in their backyard.

Sustaining the island would be difficult, but certainly not impossible. This paper examines a potential solution to the problem by first analyzing Operation *Vittles*, commonly known as the Berlin Airlift. In the Berlin Airlift, the western allies used the operational factors of space and force to attain an advantage that gave time for the will of the population of West Berlin to continue resistance. The same principle holds true in the aforementioned Taiwan scenario. The lessons learned from Berlin are then applied to the design of an operation to sustain Taiwan in a crisis scenario through the use of a civilian airlift capability. The character of our main airlift platform will help us use the forces of international law and information operations to increase the probability that our aircraft can access the country. This idea is designed to place the PRC in a position where it is forced to either take the first shot, and risk loss of legitimacy on the world stage, or de-escalate the situation for a political settlement.

Introduction

The balance of power in Asia has changed with the rise of the People's Republic of China (PRC). The PRC's dependence on other nations for trade to support her expanding economy makes it likely that this rise will continue to be peaceful. Nonetheless, the U.S. must be prepared to deal with the possibility that an internal or external crisis could cause China to react with military force in a way which conflicts with the national interest of America or her regional partners. The PRC leadership could, for example, attempt to compel the unification of Taiwan with the mainland through a coercive military operation. Such an operation could take many forms. One option that has the advantages of high probability of success with a relatively low risk of failure would be a People's Liberation Army (PLA) enforced total blockade of Taiwan.¹

Current U.S. policy supports a reunification of Taiwan with the mainland under peaceful means exclusively.² Therefore, a U.S. Joint Force Commander (JFC) could be assigned the objective of sustaining the population of Taiwan by countering the PRC blockade, to provide time for a favorable diplomatic settlement. Such an operation would have numerous challenges. The operation must first gain back the operational factor of time for Taiwan. This would require the use of force to break the blockade and provide the island nation with the sustenance that the population needs in order to continue resistance. The numerous anti-access measures that the PRC has wisely invested for protecting their operational environment must also be neutralized, or the U.S. could face unacceptable risks.³ Finally, efforts must be taken to ensure that the crisis remains one that is local in character, without facing a risk of escalation that is counter to U.S. strategic interests.

Despite the difficulty of this problem, a potential solution can be garnered from an examination of history. On midnight, 24 June 1948, the U.S.S.R. blockaded the western allied controlled sectors of Berlin⁴ in an effort to force greater Soviet influence in West German affairs. At a minimum, they hoped to achieve Soviet dominance of Berlin.⁵ The U.S. and Great Britain wanted to maintain their position in West Berlin as agreed upon in the 1945 Potsdam Agreement, and gain time for diplomatic negotiations.⁶ However, escalation of the crisis into a war was a condition that neither side desired.

To meet the threat, the U.S. and Great Britain launched Operation *Vittles*, which commonly became known as the Berlin Airlift.⁷ From 26 June 1948 to 30 September 1949, a population of 2,500,000 was completely supplied by 588 aircraft, delivering 2,323,067 tons of food, supplies, machinery, and even coal.⁸ Counter-blockade efforts were made possible by using the operational factor of space, in terms of pre-existing air corridors that were defined by prior agreement with the Soviets; and factor force in the form of an extensive airlift operation to gain an advantage in terms of time for the population to stand firm.⁹ Victory was attained and the blockade was ended once the Soviets realized that it was a futile effort where the costs were not worth any potential benefits.

These same principles can be used to design an operation to counter a PRC coercive campaign against Taiwan. This paper will show how the U.S. could use an airlift to sustain the country while preventing crisis escalation. A key element of our proposal is the exclusive use of civilian, rather than military aircraft. The character of our main airlift platform will help us use the forces of international law and information operations to increase probability that our aircraft can access Taiwan. This idea uses efforts short of lethal force to place the

PRC in a position where it must take the first shot, which could place the legitimacy of its cause at potential risk.

The main purpose of this effort is to stir discussion on a new operational idea for dealing with a problem, the successful resolution of which could have a significant impact on U.S. strategic power in Asia. There are undoubtedly a large number of logistic considerations that are not covered here that must be analyzed in later efforts. Furthermore, the success of this proposal hinges significantly upon the presence of a strategic deterrent to prevent the PRC from shutting down the operation completely. This matter is beyond the scope of an operational JFC, and would have to be in place through Phase 0 shaping efforts well before the start of a crisis situation. Therefore, it will not be discussed here.

Hence, this approach will first evaluate specifics on how the western allies balanced the operational factors of time, space and force to turn the tables in terms of factor time against the Soviets. We will then examine the relationship between these same factors in the aforementioned Taiwan blockade scenario, and discuss how the functions of operational protection and sustainment could be used for the best effect in a potential PRC anti-access effort. JFC-oriented recommendations will complete the discussion.

The Berlin Airlift: Building Time through Space and Force

The Theater Strategic Objective of the U.S. and Great Britain at the time of the Berlin Blockade was to demonstrate a strategic resolve against Soviet expansionist efforts in Europe. The objective of Operation *Vittles* was to sustain the western allied presence and civil population of West Berlin through a massive airlift.¹⁰ The key to the operational level success of this endeavor lied in the ability of the western allies to use space and available

force to gain an advantage in terms of time over the Soviets, without the potential for creating a wider conflict.

At the start of the Berlin Blockade, the Soviets rightly believed that time was on their side. West Berlin had only a month of food remaining.¹¹ The daily food requirement in Berlin prior to the blockade was 13,500 tons. Most importantly, heating during the extremely cold winter in Berlin required coal, of which reserves were minimal.¹² In June 1948, 75% of West Berlin's electricity was generated in the Soviet controlled eastern sector. This power was cut off at the start of the blockade due to "technical reasons."¹³ Finally, industry in Berlin required not only power, but raw materials in order to continue operation. Without some maintenance of industry, unemployment would likely skyrocket and families would be largely unable to support themselves.¹⁴ The compounding requirements made the sustainment of the entire city by air seem almost impossible.

The western Allies used space and force to regain the time that it needed. As West Berlin was in a sea of Communist controlled territory, the only advantage that the U.S. and Great Britain had in terms of factor space was a pre-existing agreement among all four powers to maintain three air corridors that connected air bases in West Germany with Berlin.¹⁵ These corridors could have easily been shut down by the Russians.¹⁶ The Soviets had numerous fighter bases in close proximity to the routes and had an overwhelming numerical superiority of military forces in East Germany alone.¹⁷ The U.S. was able to prevent escalation, thus keeping the routes open, through the use of a strategic deterrent: the deployment of 60 nuclear-capable B-29 Stratofortress bombers to Europe.¹⁸ This action raised the stakes in theater for the Soviets, as an escalatory move to cease the airlift by force could have resulted in a wider war that put the future of the U.S.S.R at risk.¹⁹

With a deterrent in place, the U.S. and Great Britain could increase their force through a significant expansion of airlift operations. U.S. Strategic airlift assets from around the world were ordered to Germany as part of the newly formed Combined Airlift Task Force.²⁰ Operational efficiency was maximized through capacity-expanding de-confliction measures in the air corridors and by removing bottlenecks in loading and unloading areas.²¹ Although the capacity of the airlift increased to levels unprecedented in history,²² it would have been useless without what was arguably the most important element of force in the Berlin Blockade: the will of the residents of West Berlin to resist against the Soviets, and hold out on the side of the Allies.

Military theorist Carl von Clausewitz viewed factor force as the product of available means and strength of will.²³ The U.S. and Great Britain provided the means through military power, but strength of will was dominated by the civilian population. Their will for continued resistance was maintained in part by outstanding leadership on the part of the pro-western politicians, factory owners, and trade unions.²⁴ It was founded in the fact that the citizens had experienced Soviet post-war atrocities and were unwilling to submit; as long as they had the support of the U.S. and Great Britain.²⁵ Information operations on the part of the U.S. and Great Britain served to reinforce their legitimacy among the population.²⁶ The most effective of these was the airlift itself; despite the fact that electricity usage restrictions made it difficult for the citizens to listen to the radio, the sound of aircraft conducting 24 hour flight operations was a constant communication of support.²⁷ One writer referred to the noise of aircraft engines as “a symphony of freedom.”²⁸ These efforts certainly helped to show the population that the U.S. and Great Britain were stronger than the Soviets, were behind their cause of freedom, and most importantly, could be trusted.²⁹

Resolution and Key Lessons Learned from the Berlin Airlift

The success of the airlift and the evident will of the citizens of West Berlin to resist proved to the Russians that the blockade effort was an exercise in futility. The final “straw that broke the camel’s back” was the combination of a counter-blockade that denied Russia valuable reparations from West Germany, and the April 1949 signing of the treaty that formed the basis of the North Atlantic Treaty Organization (NATO).³⁰ The blockade was officially terminated on 12 May 1949.³¹ In the end, the Berlin Airlift achieved its stated objective.³² The price of the operation was 65 lives lost and approximately \$200,000,000 in U.S. dollars, which would equal about \$1.7 billion inflation adjusted dollars today.³³ But there is no doubt that the costs were well worth it.

Operation *Vittles* was successful because the U.S. and Great Britain had air corridors available to sustain Berlin on the basis of a previous agreement with the Soviets; terminating the rights of this access would have come at the cost of unacceptable escalation. The western Allies were able to use the resources at their disposal to sustain the basic needs of the population by airlift alone. Most importantly, the resolve, strength, and legitimacy of the western allies were proven to the population of West Berlin by the success of the airlift. This empowered the residents to continue resistance against the Soviet menace. These same critical factors behind the victory of the U.S. and Great Britain in Berlin can be applied to our design of an operation to counter a PRC blockade of Taiwan.

The Taipei Airlift

As discussed previously, the political objectives of the U.S. and the PRC in a Taiwan blockade scenario would likely be almost identical to those found between the western allies

and the Soviet Union during the Berlin Blockade. For our purposes, we will assume that Taiwan's objective is merely to maintain their "status quo," without making any aggressive moves in the direction of independence.³⁴

The Russians were able to blockade West Berlin by simply setting up roadblocks across the access routes into and out of the city. Evidence suggests that the PLAN would do the same in the maritime arena, using the stealthy advantages of their submarines to lay time delayed bottom mines in the approaches to critical port facilities.³⁵ Although efforts to resist the blockade could be met with increasing levels of military force, it would be in the best interest of the PRC to do all that it could to avoid being the first shooter for the sake of maintaining international legitimacy.³⁶ Military action by the Taiwanese, U.S., or other nations would give it justification under international law for proportional military response. This path could lead to increased escalation, as would have been the case if either side had used lethal force during the Berlin Airlift.

Factor Force

Force is one operational factor that would allow us to gain an advantage in terms of factor time. As was the case in Operation *Vittles*, our situation requires an adequate deterrent in place to allow non-lethal means to counter the actions of the PRC without risk of escalation. In contrast to the nuclear deterrent used during the Berlin Airlift, a deterrent for the PRC would likely be economic or geo-political in nature.³⁷ A JFC must be aware that the lack of a sufficient deterrent in our scenario to restrain escalation will increase risk significantly, and would make our operational idea infeasible.

As in our analysis of the Berlin Airlift, the most important element of factor force we need to consider is the strength of Taiwan to continue its defiance of the PRC blockade. In

the case of Berlin, Soviet coercion actually increased the will of the Germans to resist; as an unintended effect of PRC actions during the 1995-1996 Taiwan Straits crisis, Taiwanese independence sentiment actually increased as well.³⁸ Maintaining this spirit will require the same considerations as we discussed earlier of providing tangible proof of our support for the people, through actions and information operations. The sound of aircraft conducting 24 flight operations over Taiwan could serve as the same “symphony of freedom” that the population of Berlin listened to 60 years ago.

Factor Time

Before we can determine how to counter a blockade, we must know what means are required in order to meet our objective. As an island nation, Taiwan is highly dependent on external resources, especially for energy needs. 83.1% of Taiwan’s energy supply is currently generated through imported fossil fuels.³⁹ Taiwan also depends almost exclusively on imported petroleum, delivered by tankers, for transportation and manufacturing needs.⁴⁰ The access of these vessels to Taiwan would likely be denied in a blockade scenario. Taiwan’s oil reserves are also negligible, with an advertised proven oil reserve of 2 million barrels.⁴¹ Given yearly consumption in 2005, this equates to a reserve of only 2.5 days of oil with consumption at normal levels.⁴²

In the case of the Berlin Airlift, land routes were simply not an option. In our case however, although it will not be a focus, it is important to consider in terms of factor time the period after which sea lanes to Taiwan could realistically be opened up to facilitate critical maritime commerce. A Massachusetts Institute of Technology (MIT) analysis on the PRC mine threat has determined that under worst-case scenarios, the existing Taiwanese Navy mine countermeasures fleet of 12 vessels could clear routes (called q-routes) through the

three largest ports in Taiwan within a month.⁴³ Therefore, an operation to sustain Taiwan in the interim, through the use of an air lift capability, should focus on the objective of buying enough time for sustainment during that one month period. After this, the political and military situation will dictate the feasibility of mounting counter-maritime blockade operations.

In terms of factor time, it is evident that the PRC needs a quick victory. Without this, it becomes susceptible to a decrease in foreign trade that could have dire economic consequences, potentially impacting her domestic stability.⁴⁴ China and Taiwan have a trade relationship that is highly inter-dependent.⁴⁵ Although Taiwan would also suffer, it is arguable that they could have the patience to wait for the long haul with the potential on the horizon for international recognition of independence, given the right conditions. Using factor space and factor force to gain an advantage can create these conditions.

Factor Space

Unlike the case of the Berlin Airlift, we certainly cannot expect that we will have an existing agreement that will give us air access to the country. The PRC would logically choose in a blockade scenario to create a total exclusion zone (TEZ) over Taiwan to deny our efforts. Even a TEZ has vulnerabilities that could be exploited by the use of unconventional means. The operational idea that follows will use international law and information operations to provide operational protection for airlift assets and in essence, create our own air corridors into Taiwan.

Operational Protection

Chinese military writings have described three “new” forms of warfare: Legal Warfare, Psychological Warfare, and Public Opinion Warfare.⁴⁶ As we can certainly expect the PRC to use such types of warfare in a Taiwan crisis scenario, we should be prepared to do the same to ensure protection of our airlift capabilities. The first element of our operational idea is to use not military aircraft, but neutral civilian aircraft.⁴⁷ There is an existing precedent for this concept, as the British in the Berlin Airlift used civilian aircraft under contract to augment their lift capability.⁴⁸ Today, the U.S. uses her Civil Reserve Air Fleet (CRAF) of 1,364 civilian passenger and freight aircraft under contract in a similar role to support ongoing military operations worldwide.⁴⁹ Although CRAF aircraft could certainly be used to provide airlift to Taiwan, the use of international carriers other than those held by the U.S. or Japan can be expected to have a higher ability to deter PRC hostile actions.⁵⁰

Airlift assets must be on the defined mission of providing humanitarian aid and assistance, and must not be carrying any items that are military in nature or could be considered “absolute contraband.”⁵¹ The aircraft must also be non-Taiwanese to minimize the potential of acquiring “enemy character.”⁵² If airlift assets have a point of origin from a partner in our efforts that has a strategic relationship with China, (such as Singapore), our protection will likely be even higher.⁵³ It must also be made clear to the PRC and the world at large that the Taiwanese are not controlling or directing the airlift; rather, airlift operations are conducted under the control of neutral nations by the request of the Taiwanese government to provide humanitarian aid.⁵⁴ These aircraft can also be identified in a role as

non-combatant evacuation operations aircraft, and thus be protected under by the principle of distinction under international law.⁵⁵

The next element of operational protection delves into the realm of public opinion warfare and information warfare. The airlift operation should be covered extensively by international media to ensure worldwide knowledge of the event. Aircraft loading operations should be filmed to provide distinct evidence of the nature of their cargoes. All aircraft should have cameras installed in their cockpit that are capable of transmitting live footage during flight operations, especially during entry and exit of Taiwanese airspace. These actions would place any hostile action on the part of the PRC to stop the airlift on the world stage, and elevates the risk of resultant loss of international legitimacy.⁵⁶

Finally, although most of the protection for airlift assets falls to the realm of “soft power,” U.S. forces will need to be present in the background to provide some measure of protection. U.S. Combat Air Patrol (CAP) aircraft should not directly escort aircraft. Such actions may be overly provocative and could impart a military character on the nature of the airlift itself. They should be positioned east of Taiwan with accompanying Electronic Attack (EA) and Intelligence, Surveillance, and Reconnaissance (ISR) aircraft to act as a local deterrent option.

In summary, the essence of protection in our scenario is to create our own air corridors, using the weapons of international law and a potential risk of losing international legitimacy to ensure safe passage. With that being said, there is no doubt that the PRC could use its own force to deny these measures. They could easily mount their own “humanitarian” airlift operation to support Taiwan. The Soviets adopted a similar strategy during the Berlin Airlift, offering food and jobs to West Berlin residents that made the relative deprivations

that the limited capacity of the airlift caused unnecessary.⁵⁷ Of note, only 4 % of the population accepted the offer.⁵⁸ If the Taiwanese did refuse to accept this aid, the PLA could use Special Operations Forces (SOF) to sabotage key airfield infrastructure. Further escalation would logically involve PLA Second Artillery strikes, using medium range ballistic missiles (MRBM) with runway penetrating warheads to shut down Taiwanese airfields.⁵⁹ U.S. operational commanders must be prepared for these contingencies. However, ballistic missile strikes against Taiwan to deny humanitarian flights would severely hurt the legitimacy of the PRC. Continued escalation would force the U.S. to adopt a conventional force based branch plan, but one that would have the advantage of enhanced global support over a scenario where America took the first shot. It could even help to create conditions where the U.S. could rely on increased assistance from regional partners, who have an interest in preventing a potential for PRC hegemony in Asia.

Operational Sustainment

Sustainment is clearly the dominant operational function in any effort to counter a blockade. In the case of the Berlin Airlift, a complete mobilization of U.S. and British airlift assets was required; efforts that would be required to sustain an entire country would also be massive. Fortunately, today we have aircraft with capacities that are significantly larger than any that participated during Operation *Vittles*, and more of them.⁶⁰ Furthermore, the development of air freight business practices has forced companies to become extremely efficient in their means. Goods are loaded into coded containers that can easily be rolled on and off aircraft, providing for much more rapid turn around times. Based on numerous sources in the civilian air freight industry, we will use an assumption that a 747-400F with

palletized cargo can be completely off loaded, on loaded, and refueled, in 1.5 hours, from wheels on deck to wheels airborne.⁶¹

Tables 1 and 2 illustrate Taiwan’s food and energy needs in 2005, and provide us with a “ballpark estimate” for calculating the resources that we would need in order to sustain the population on a daily basis.

Table 1: 2005 Taiwan food production and imports. Units in Metric Tons (MT) x 1000. “Redux” for both cases assumes food and fuel requirements reduced by 50%. Total daily shortfall assumes a requirement to supply the population with an equal percentage of each type of food product. Adapted from *Taiwan Food Supply and Utilization, 2005*, http://eng.coa.gov.tw/htmlarea_file/web_articles/7528/1.10.pdf (accessed 3 April 08)

| Product | Domestic | Import | Total | % Imported | Total post Redux | Shortfall | Daily Shortfall |
|------------|----------|---------|---------|------------|------------------|-----------|-----------------|
| Cereals | 1284.8 | 6840.8 | 8125.6 | 84.19% | 4062.8 | 2778 | 7.611 |
| Roots | 267.5 | 1246.6 | 1514.1 | 82.33% | 757.05 | 489.55 | 1.341 |
| Vegetables | 2310.7 | 383.8 | 2694.5 | 14.24% | 1347.25 | 0 | 0.000 |
| Fruits | 2601.9 | 610.7 | 3212.6 | 19.01% | 1606.3 | 0 | 0.000 |
| Meat | 1613 | 274.6 | 1887.6 | 14.55% | 943.8 | 0 | 0.000 |
| Seafood | 1327.5 | 1499.7 | 2827.2 | 53.05% | 1413.6 | 86.1 | 0.236 |
| Total | 9405.4 | 10856.2 | 20261.6 | 53.58% | 10130.8 | 3353.65 | 9.188 |

Table 2: 2005 Taiwan coal and petroleum requirements (x1000 MT). MLOE: Million Liters of Crude Oil Equivalent.

| Energy | 2005 Consumption | Post-Redux | Daily Requirement | Very Large Crude Carriers Req’d/Day |
|----------------------------|------------------|------------|-------------------|-------------------------------------|
| Coal ⁶² | 59,363 | 29,681.5 | 81.319 | N/A |
| Petro ⁶³ (MLOE) | 47,502 | 23,751 | 65.071 | 8.595 |

Before calculating the daily requirements for an airlift operation to sustain Taiwan, we must first identify a critical limitation on our capability. Despite the fact that there are several means available for the air transport of petroleum products, these methods are inefficient when applied to a large scale and would not realistically be able to support even a

75% reduction of our assessed requirement as listed in Table 1.⁶⁴ Therefore, an airlift operation cannot be expected to meet these requirements. Our objective is to maintain the basic needs of the population until q-routes can be opened up for the access of Very Large Crude Carriers (VLCC) to Taiwan ports, with any fuel that does arrive by aircraft prioritized for offloading and distribution of delivered materials.

Totaling the daily requirements for food and coal from the data above with a 50% reduction gives us a daily delivery requirement of approximately 90,500 Metric Tons (MT). This number is likely extremely conservative; in the case of the Berlin Airlift, aircraft availability and capacity limited planned daily delivery of food to only 37% of the pre-blockade requirements.⁶⁵

The next step in our process is to determine the number of aircraft needed to deliver our required tonnage. This number will be necessary in order to validate the feasibility of using an existing fleet of aircraft to sustain the needs of Taiwan. For the sake of simplicity, we will only consider 747-400F freighters into our calculations. This aircraft is used worldwide and is the highest capacity common freight carrier, with a capacity of 113 MT.⁶⁶ With this number, we can calculate the number of aircraft arrivals needed to meet our requirements, as identified in Table 3 below.

Table 3: 747-400F airlift arrivals needed per day.
747-400F freight capacity is 113 MT.

| Food | | Coal Energy | |
|---------------------|----------------------|---------------------|----------------------|
| Needed Arrivals/Day | Needed Arrivals/Hour | Needed Arrivals/Day | Needed Arrivals/Hour |
| 81.3 | 3.4 | 719.6 | 30 |

Next, the total number of missions that any one aircraft could theoretically support in one day must be determined. This number will depend on the time of flight from point of

origin to its destination in Taiwan, time to load and unload, time to return, and time to unload, reload, and refuel at the point of origin.⁶⁷ Table 4 shows that one 747-400F with a point of origin at either Naha International Airport in Okinawa or Nimoy Aquino International Airport in the Philippines could fly three missions daily.⁶⁸ Dividing the number of required arrivals by the number of missions that one aircraft could support per day yields our final requirement of 267 747-400F aircraft, also as listed below. This number is certainly attainable, given a potential fleet of 522 of these aircraft worldwide.⁶⁹ CRAF assets alone comprise a total of 990 aircraft of different models that are certified as long-range international assets.⁷⁰

Table 4: Number of 747-400F required. All times in hours. Enroute time assumes 747-400F cruise speed at 35,000 at 555kts, transit time from Naha International (Okinawa) or Nimoy Aquino International (Phillipines), +15-20 minutes of bias. Differences in time between destinations in Taiwan are negligible.

| Enroute time to Twn | Twn offload/load | Enroute time to base | Base offload/load and refuel | Total time/mssn | Single aircraft mssns/day | Total 747-400F needed |
|---------------------|------------------|----------------------|------------------------------|-----------------|---------------------------|-----------------------|
| 1.25 | 1.5 | 2.00 | 1.5 | 6.25 | 3 | 267 |

The most significant factor for determining the viability of our concept is not the number of aircraft available; it is the capacity at the airport to hold and manage a large number of aircraft and efficiently on and offload them.⁷¹ Table 5 shows aircraft movement during 2007 at Taiwan's two largest airport facilities.

Table 5: Air freight throughput at Taiwan's major international airports. Tonnage refers to air freight exclusively, not personal luggage. Adapted from: Taiwan Ministry of Transportation and Communications, *Volume Indexes of Transportation and Communications*, <http://www.motc.gov.tw/mocwebGIP/wSite/ct?xItem=4882&ctNode=213&mp=2> (Accessed 6 April 2008)

| Taiwan Taoyuan International Airport | | Kaohsiung International Airport | |
|--------------------------------------|------------------|---------------------------------|------------------|
| Aircraft Movement | Tonnage of Cargo | Aircraft Movement | Tonnage of Cargo |
| | | | |

| | | | |
|---------|---------------|--------|---------------|
| | (Metric Tons) | | (Metric Tons) |
| 160,120 | 1,605,681 | 67,149 | 70,241.3 |

Between these two airports, the averaged total is 4591.56 Metric Tons of air freight moved per day in 2007. To meet our needs, the freight capacity of both airfields would have to be increased significantly by a factor of 18 times the current daily operational load.⁷² Some solace though can be provided by the fact that the numbers above for Taiwan assume peacetime airfreight only. During a blockade, resources normally devoted to air passenger operations would be devoted to freight operations.⁷³ Furthermore, infrastructure at Berlin airfields at the start of Operation Vittles was also weak. Despite the blockade, runways were expanded to provide for increased capacity to meet the required need.⁷⁴

As mentioned earlier, a major issue concerning loading and offloading operations will be the dual requirements of petroleum at the airfield for airfreight associated ground support equipment (GSE), and for delivery of goods throughout Taiwan. Any petroleum that can be shipped in via aircraft must be prioritized for this purpose, or the success of the operation will be unlikely. This was not as much of an issue in the case of Berlin, as it represented a case where the geographic area was relatively small. In the case of Taiwan, transportation needs will have to be met to ensure that goods can be offloaded and distributed.⁷⁵

Challenges

Some challenges have already been presented to the incorporation of this operational idea, including the potential for China to obliterate our efforts through the use of MRBM strikes on Taiwanese airfields, the need to expand air cargo capability at Taiwan's main airports, and petroleum requirements for distribution of resources. A JFC must also be

certain that strategic level shaping efforts have provided for a suitable deterrent to prevent PRC escalation. Otherwise, our probability of success with this option will be minimal.

Finally, it is not the assertion of the author that an airlift by itself could save Taiwan from PRC coercion. In the case of the Berlin Blockade, Operation *Vittles* was one means that was used to sustain the will of the population to resist. For a potential future scenario in Taiwan, an airlift would serve a similar purpose. The major challenge presented in the scenario is that due to the problem of petroleum needs for industrial sustainment, some degree of sea lift capability will certainly be needed to keep the country running over the long haul. With that being said, the airlift would help preserve the strength of the population to defend against PRC coercion, by acting as a visible and auditory reminder to the Taiwanese people that the free world supports their decision to solve the matter of reunification with the mainland peacefully. It would tip the balance of factor time back towards the favor of Taiwan, to give time for mine clearing operations and counter-maritime blockade operations to start. Most importantly, the use of an airlift in this construct would serve to complicate the ability of the PRC to escalate the situation, without potentially accepting higher risk for loss of international credibility, political strength, economic strength, and potentially internal domestic strength.

Recommendations

The time-sensitive and up-front complexity inherent in our proposed operational idea to sustain Taiwan by airlift requires extensive planning in advance to ensure highest probability of success. This study and its proposed course of action (COA) leave us with several recommendations that are relevant for commanders that serve at the operational level today:

1.) As mentioned in the introduction of this paper, this study is a call for initial discussion and analysis. Further extensive study in the area of true cargo loading and offloading capacity at potential airlift “feeder airports,” as well as those in Taiwan should be completed in detail.

2.) Specific plans that detail ground traffic patterns, organization of staging areas for supplies, and procedures should be developed that maximize the capability of Taiwan Taoyuan and Kaohsiung International Airports for air freight operations in a crisis scenario. This effort is one of the most crucial determinants of success, in that it will likely be the limiting factor, beyond enemy action, on the capacity of goods that can be delivered.

3.) China’s MRBM capability is significant, and any investment in runway hardening or repair capability expansion on the part of the Taiwanese may appear to be futile. But on the other hand, only a limited number of the warheads in the PRC’s inventory will be runway penetrator variants. Taiwan should be urged to make improvements in their capability to rebuild after such an attack.⁷⁶ Repairing and reopening a runway would at a minimum, provide a clear message of strength of will.

Conclusion

The Berlin Airlift represented a case where the U.S. and Great Britain were able to demonstrate a strategic resolve against Soviet expansionist policies in Europe without causing a wider conflict. In the case of a PRC total blockade of Taiwan, the U.S. and her allies must exhibit a similar tenacity to counter China’s use of coercion to attain reunification. A JFC who is assigned the objective of countering these efforts by the PRC must gain enough time for Taiwan’s continued resistance, pending a favorable diplomatic settlement. Space can be used to regain time by using international law and information

operations to provide operational protection for civilian cargo aircraft. Force would be used in the form of a robust airlift capacity that is capable of meeting the needs of the population. Although the PRC could easily terminate such an operation through multiple means, it would do so with the risk of being the one considered an aggressor, with a concomitant loss of legitimacy on the world stage.

During the Berlin Airlift, Ernst Reuter, the Mayor of the Berlin made the resounding statement that “the thunder of the aircraft motors...has preserved our trust in the moral strength of the world-a strength which has guaranteed to us that one day we will win our freedom and independence.”⁷⁷ The most important aspect of factor force during the 1948 Berlin crisis or in a potential future PRC coercive operation to strangle Taiwan is the determination of the people to resist. This will relies heavily on the most important form of power: trust that the U.S. and her allies will standby the peaceful right of a nation to exist without being threatened by coercion.

Endnotes:

(All notes appear in shortened form. For full details, see the appropriate entry in the bibliography.)

¹ The article Why China Cannot Conquer Taiwan, by Michael O’Hanlon provides an excellent description of why a blockade rather than an amphibious invasion is a more likely PRC course of action (COA) to force Taiwan to submit to its will. The author reasons that the inherent complexity of amphibious operations and the large number of amphibious vessels required to deliver a suitable number of troops ashore make an large scale invasion of Taiwan extremely risky; when the same objective could potentially be attained by a coercive campaign with lower risk. O’Hanlon. “Why China Cannot Conquer Taiwan,” 53-86.

² According to the Taiwan Relations Act, the U.S. would consider “any effort to determine the future of Taiwan by other than peaceful means, including by boycotts or embargoes, a threat to the peace and security of the Western Pacific Area and of grave concern to the United States.” Taiwan Relations Act, Public Law 96-8 96th Congress, http://usinfo.state.gov/eap/Archive_IndexTaiwan_Relations_Act.html (accessed 10 March 2008). The 2006 National Security Strategy states that “China and Taiwan must also resolve their differences peacefully, without coercion and without unilateral action by either China or Taiwan.” U.S. President, 2006 *National Security Strategy*, 47, <http://www.whitehouse.gov/nsc/nss/2006/> (accessed 18 April 2008).

³ One potential anti-access threat is the suspected PRC development of a Medium Range Ballistic Missile (MRBM) with capability against a moving ship, ie potentially an aircraft carrier. Wortzel, *China’s Nuclear Forces*, 12-13.

⁴ Before the blockade, Berlin was under four party control of the allies, despite separate areas of occupation. Although the name was not in use at the time, for the sake of simplicity we will refer to the U.S., French and British sectors of Berlin as “West Berlin.”

⁵ Davison, *Berlin Blockade*, 144-148.

⁶ James Byrnes, the U.S. Secretary of State, in a speech to the German people in Stuttgart in 1946 make the statement that “ the United States will not support any encroachment on territory which is indisputably German or any division of Germany which is not genuinely desired by the people concerned. So far as the United States is aware the people of the Ruhr and the Rhineland desire to remain united with the rest of Germany. And the United States is not going to oppose their desire.” Byrnes, *Restatement of U.S. Policy on Germany*, <http://usa.usembassy.de/etexts/ga4-460906.htm> (accessed 18 April 2008). However, after the blockade, the U.S. National Security Council was split on the decision to support Berlin. The main basis in favor of action, as stated by President Truman, was founded on the enforcement of terms stated in the 1945 Potsdam Agreement for Four Party Governance in Berlin; which the Soviets in principle did not have the right to rescind. On the other hand, it is believed that the British side had a view that was more in line with the principle that sustaining their presence in Berlin was a vital part of their national interest in preventing a war in Europe. Davison, *Berlin Blockade*, 149-151.

⁷ The British called the operation Operation *Plainfare*. Collier, *Bridge Across the Sky*, 66.

⁸ Ibid., 161-162 .

⁹ Davison, *Berlin Blockade*, 33-37.

¹⁰ Ibid., 153-154.

¹¹ Specifically, western Berlin had only 17 days of flour, 25 days of meats/fish, 42 days of potatoes, and 26 days of milk remaining. Collier, *Bridge Across the Sky*, 64.

¹² At the start of the blockade, only a thirty day supply of coal was available. Davison, *The Berlin Blockade*, 314-315. Berlin was also known to have notoriously cold winters, with night wind chills approaching -20 degrees Celsius. Families were given a ration of 20 lbs. of coal to last the entire winter, which amounted to only a teaspoon a day. Ibid., 131.

¹³ During the initial occupation after the fall of Berlin in 1945, the Soviets dismantled the main power plant in the western sector, leaving only two small power plants behind. Davison, *Berlin Blockade*, 21-23.

¹⁴ Ernst Reuter, the elected mayor of Berlin, was initially skeptical of the potential success of the Berlin Airlift. He believed an effort to maintain the support of the population would not only require providing for their material needs, but would also require support for a maintained industrial capacity. Maintaining a semblance of industry would provide employment for the blockaded citizens of Berlin.. This was certainly a daunting challenge, as providing for the basic needs of 2.5 million people was difficult enough. However, it is a remarkable achievement that unemployment remained relatively low during the crisis, from a pre-blockade rate of 5% to a peak of 17% in April 1949. Citizens were able to work largely due to employment opportunities with the allies in construction and airlift operations, and the will of manufacturers to adapt and continue limited scale production. For every 260 tons of raw materials that came into the city during the blockade, 100 tons of manufactured good were in fact loaded outbound. Davison, *Berlin Blockade*, 316-317.

¹⁵ Ibid., 33-37.

¹⁶ The Russians used barrage balloons, launched waves of fighter aircraft to harass allied supply aircraft with warning shots and close passes, fired anti-aircraft artillery, and interfered with navigation aids in an attempt to draw aircraft away from the corridors. Between August 1948-49, U.S. aircraft alone reported a total of 733 instances of Soviet harassment, including 96 close passes, 55 anti-air artillery incidents, and 14 air-to-air gunfire events. Collier, *Bridge Across the Sky*, 164. One Navy Ensign reported counting 40 Yakolev fighters on his tail at one time, and others reported close passes by Russian aircraft with chains and wrecking balls attached to their fuselage. Ibid., 146.

¹⁷ The ratio of Soviet military forces to their western allied counterparts in Germany was 17:1. In the aftermath of World War II, the U.S., France, and Great Britain had downsized their respective militaries significantly. Between the three of them, they had only 6,500 soldiers stationed in Germany (including western sectors of Berlin). The Soviets, on the other hand, maintained high troop levels in Europe. Their total strength in Germany alone was approximately 300,000 soldiers, with 8,000 of these in the Eastern Sector of Berlin. Ibid., 52-53. The U.S., in contrast, had only one division that could be deployed to the area with any speed, with another in reserve. Davison, *Berlin Blockade*, 155.

¹⁸ Although the B-29s could have struck targets in Russia, the Soviets believed that such an event would merely provide them with justification to use their overwhelming conventional forces to take all of Europe, a risk they felt the allies would not be willing to take. Davison, *Berlin Blockade*, 155-156.

¹⁹ According to a RAND study of the effectiveness of the Berlin airlift, although “the location of the B-29 bombers in England probably did not exert any very appreciable influence on the Soviets to change their

blockade policy, it may well have helped to set a limit beyond which they felt they could not go without running new and serious risks.” Ibid., 157.

²⁰ The decision to increase the number of airlift aircraft supporting Operation *Vittles* was highly contentious among the U.S. Joint Chiefs of Staff (JCS). There was fear that a maximum effort of airlift resources put the U.S. in a vulnerable position if the Soviets decided to escalate the crisis. If aircraft were lost, the U.S. would have a degraded capability to provide strategic airlift capability for supporting forces worldwide. There was also concern that as the air corridor agreement provided for co-use among all four of the allied powers at the end of WWII, an excessive amount of U.S./British aircraft could force the Soviets out, causing further international incidents and potential escalation. Collier, *Bridge Across the Sky*, 91.

²¹ The immense volume of aircraft arriving in Europe without an adequate supporting infrastructure presented many challenges to initial operations. Historian Richard Collier describes it as “a fire alarm haste coupled with a total lack of long-range planning.” The task force had a minimal staff, due to expectations that the operation would be over soon. Despite the large number of aircraft, the number of marshalls and ground personnel were insufficient. Aircrew were also lacking, requiring grounded pilots to fly part-time to ensure full-time aircrew could get at least some rest. Collier, *Bridge Across the Sky*, 69-71. A goal was set for launching one loaded aircraft every 3 minutes, with a minimum 5 minute interval within each aircraft in the corridors. U.S. corridors became one way, using a “round robin” route to provide de-confliction and maximize capacity, and were also separated vertically by aircraft type to compensate for different cruise speeds. Ibid., 101-102.

²² The end result of these improvements was the famed “Easter Parade,” the peak of Operation Vittles, in which 1398 flights delivered a record 12,941 tons of supplies in a 24 hour period between 16-17 April 1949. Ibid., 154.

²³ Clausewitz, *On War*, 77.

²⁴ Davison, *The Berlin Blockade*, xiv.

²⁵ A UNESCO sponsored poll of 644 sampled West Berliners identified that 79% of those surveyed felt that the Soviets were the foreign people for which they felt the “least friendly toward.” Davison, *Berlin Blockade*, 326.

²⁶ One famous example of Information Operations in the Berlin Airlift was Operation *Little Vittles*, in which 1stLT Gail Halvorsen dropped parachutes filled with candy out of his aircraft while on approach to waiting crowds of Berlin children. This operation was initially an individual effort, but Major General Tunner later on provided full endorsement of it. On one occasion, Halvorsen even dropped candy over the Soviet controlled east sector. Collier, *Bridge Across the Sky*, 105-107.

²⁷ The power shortages and resulting restrictions meant that citizens simply could not listen to the radio for updates; a major disadvantage for allied information operations in the West. Despite the 100,000 watt radio station in the western sector, radio station personnel would travel through the city in vehicle with a loudspeaker to ensure that the citizens had a link to the news of the free world. Ibid., 84.

²⁸ Davison, *The Berlin Blockade*, 331.

²⁹ A post-Berlin Airlift RAND study examined multiple essays and writings in West Berlin and West German media that were written before, during, and after the blockade. Numerous factors convinced the population of the strength possessed by the western allies, including the speed at which the operation was mounted, the impressive mechanics of the operation, and devotion of the allies to the values of “peace, freedom, humanity, [and] charity” in contrast to those values assumed to be possessed by the Soviets. 83% of West Berlin respondents in a fall 1948 survey identified the western allies as the side most likely to win in the event of a conflict with the U.S.S.R., with only 4% believing that the Soviets would attain victory. Ibid., 330-331.

³⁰ Prior to the blockade of Berlin, the U.S.S.R. received a million tons of Coal and 30,000 tons of steel per year from this region. Ibid., 100. Rail access was cut off to these resources in July 1948. In February 1949, the allies had completely cut off Russian access to resources in western Germany. Ibid., 164. This treaty was the direct result of the concern that European nations had for the intentions of Russia in Europe. The Soviet's coercive and expansionist actions, such as in the Berlin Blockade and Eastern Europe, left many doubts. 2006 NATO Handbook, 17, <http://www.nato.int/docu/handbook/2006/hb-en-2006.pdf> (accessed 29 March 2008). Depending on the strategic conditions, it is certainly possible that a PRC operation to use military force against Taiwan could form the creation of a similar alliance; which would not likely be in the best interest of China.

³¹ Collier, *Bridge Across the Sky*, 154-5.

³² Although the Blockade was over, the U.S. and Great Britain remained somewhat skeptical. To minimize any potential vulnerability, the airlift itself continued for three months, ending on 30 September. These efforts served to not only demonstrate continued will, but also built up three months of supplies in the city. Thus, if the Russians decided to mount another campaign, the city would be prepared to sustain itself until time was available for the allies to achieve maximum effort once again; a valuable operational level deterrent. Ibid., 158.

³³ Ibid., 165.

³⁴ Aggressive pro-independence actions by Taiwan would likely be considered by the world community to be extremely irresponsible. This would limit the ability of world powers to provide support to Taiwan in the event that the PRC countered such actions with military force in retaliation. For example, with regards to the pro-independence policies taken by former Taiwanese President Chen Shui-Bian, President Bush "was prepared to rebuke Mr. Chen for causing tensions in Asia, a view widely shared in the region." "Taiwan Takes a New Approach."

³⁵ Cliff, *Entering the Dragon's Lair*, 71.

³⁶ The Chinese also recognize the legal implications inherent in blockade operations: "When conducting a sea blockade campaign, one should fully consider the terms of international laws; this is very significant for the political and diplomatic struggle of the nation. On the other hand, it also constrains the work of organization and command to a certain extent and increases the complexity and hardship of accomplishing the task." Wang, *Science of Campaigns*, 410. Quoted in Cliff, *Entering the Dragon's Lair*, 67

³⁷ A nuclear threat would not likely be an effective deterrent for the PRC. Although China does have a "no first use" policy, its language is clouded enough that a pre-emptive strike cannot be completely ruled out. According to the 2006 National Defense White Paper, "China remains *firmly committed* to the policy of no first use of nuclear weapons at any time and under any circumstances....it ***unconditionally undertakes*** a pledge not to use or threaten to use nuclear weapons against non-nuclear weapons states or nuclear-weapon free zones." [Author's italics] *PRC 2006 National Defense White Paper*, <http://www.china.org.cn/english/features/book/194485.htm> (accessed 8 April 2008). The best deterrent available is a strategic one that goes beyond weapons, and turns more to economics. On the side of Taiwan, the economic co-dependence between the two countries could limit economic coercion measures, on the basis of parallel effects on the economy of the PRC. Tanner, *Chinese Economic Coercion against Taiwan*, xiv. A loss of trade with the U.S. would result in a loss of 21% of its total exports, which could prove to be economically devastating. An internal economic crisis could put the status of the regime in jeopardy. http://stat.wto.org/CountryProfiles/CN_e.htm (accessed 14 March 2008). Finally, the PRC's geo-strategic relationship with other countries could constitute a deterrent. Over 50% of the PRC's oil currently comes through the Straits of Malacca, which make a partnership with Singapore one that is especially advantageous in our scenario. Dreyer, *China's Power and Will*, 659.

³⁸ Ross, "The 1995-96 Taiwan Strait Confrontation," 118.

³⁹ Taiwan Energy Supply (Indigenous and Imported), [http://www.moeaboe.gov.tw/English/Statistics/files/EnergySupply\(IndigenousImported\).pdf](http://www.moeaboe.gov.tw/English/Statistics/files/EnergySupply(IndigenousImported).pdf) (accessed 1 April 2008).

⁴⁰ Taiwan does, however, have a relatively robust refinery infrastructure. U.S. Energy Information Agency (EIA). *Country Analysis Brief: Taiwan*, September 2006, <http://www.eia.doe.gov/emeu/cabs/Taiwan/pdf.pdf> (accessed 4 April 2008).

⁴¹ U.S. Energy Information Agency (EIA). *Taiwan Energy Profile*, 24 March 2008, http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=TW (accessed 4 April 2008).

⁴² U.S. Energy Information Agency (EIA). *Country Analysis Brief: Taiwan*, September 2006, <http://www.eia.doe.gov/emeu/cabs/Taiwan/pdf.pdf> (accessed 4 April 2008).

⁴³ Glosny, "Mines Against Taiwan," 31, <http://web.mit.edu/SSP/Publications/breakthroughs/Breakthroughs03.pdf> (accessed 1 April 2008).

⁴⁴ Former Assistant Secretary of State Susan Shirk also notes that another influence of factor time with regards to the PRC is in terms of a race against a demographic clock. China will be able to grow at a significant rate for two decades partially due to an extremely high population of eligible workers. Afterwards, her demographics may shift to where resources will have to shift to support of health care and the pension system. The government may be hesitant to take any large risks that could jeopardize this potential for rapid growth. Shirk, *China: Fragile Superpower*, 20-21.

⁴⁵ In 2007, Taiwan's total exports to the PRC (including Hong Kong) included a total of 37.8% of her total exports worldwide; greater than her combined exports to the U.S., Japan, and EU combined (33.3%). World Trade Organization (WTO) Country Profiles, http://stat.wto.org/CountryProfiles/TW_e.htm (accessed 14 March 2008). A RAND study on the potential effectiveness of PRC economic coercion measures against Taiwan notes that "mainland China's own economic dependence on Taiwan is considerable; key regions and sectors of the mainland would suffer greatly in the event of major economic sanctions." Similar effects or worse could be assumed in a blockade scenario. However, as the PRC's economic strength increases, the same study notes that Taiwan's potential to resist economic coercion will likely decrease over time. Tanner, *Chinese Economic Coercion against Taiwan*, 75.

⁴⁶ Jin Hongbing. "Legal Warfare." Quoted in Dutton, Peter. "China's Views of Sovereignty and Access Control," U.S.-China Economic and Security Review Commission, 3, http://www.uscc.gov/hearings/2008hearings/written_testimonies/08_02_27_wrts/08_02_27_dutton_statement.pdf (accessed 6 April 2008).

⁴⁷ According to a RAND summary of a translation of the PLA publication *Science of Campaigns*, "Chinese strategists suggest that PLA forces should conduct unrestricted attacks against enemy military forces, but that 'official' ships and aircraft should be selectively targeted, and purely civilian vessels should be either captured or expelled. Third country vessels should be ordered to leave and those that resist should be boarded." Wang, *Science of Campaigns*, 410. Quoted in Rand, *Entering the Dragon's Lair*, 67.

⁴⁸ 25 civilian contractors contributed a total of 104 aircraft for support of the Berlin Airlift. These aircraft delivered 146,980.2 tons of cargo, representing 6% of the entire tonnage carried in the operation. Collier, *Bridge across the Sky*, 164.

⁴⁹ Civil Reserve Air Fleet Fact Sheet, <http://www.amc.af.mil/library/factsheets/factsheet.asp?is=234> (accessed 4 April 2008).

⁵⁰ Despite the recent improvements in Sino-Japanese relations, with expanded economic and military cooperation, the long standing emotional effects of Japan's hegemony over Asia from the late 19th to mid 20th century have left a mark on the Chinese population that have only been reinforced by CCP propaganda. Shirk,

China: Fragile Superpower, 153-157, 179-180. Direct involvement by Japan could potentially undermine our intent of preventing escalation.

⁵¹ NWP 1-14M, *The Commander's Handbook on the Law of Naval Operations*, July 2007 Edition, 7-6.

⁵² According to *Commander's Handbook on the Law of Naval Operations*, international law provides that civil aircraft acquire enemy character that are "operating directly under control, orders, charter, employment, or direction" or are "resisting an attempt to establish identity, including resisting visit and search." *Ibid.*, 7-8.

⁵³ To maximize potential of the airlift, assets may have to initially depart Singapore and pick up cargo from an airport that is closer in proximity to Taiwan. Given the right conditions, assistance from Singapore is feasible. For example, in 2005 the U.S. and Singapore signed a "Strategic Framework Agreement between the United States of America and the Republic of Singapore for a Closer Cooperation Partnership in Defense and Security." The document provides for "close coordination on strategic issues" and acknowledges "that the U.S. presence in the region has promoted peace and stability, which are crucial for regional cooperation and economic development."

http://app.mfa.gov.sg/pr/read_content.asp?View,4307, (accessed 8 April 2008).

⁵⁴ This fact addresses the same requirement of aircraft acquiring enemy character that are "operating directly under control...employment, or direction" as specified above. NWP 1-14M, *The Commander's Handbook on the Law of Naval Operations*, July 2007 Edition, 7-8.

⁵⁵ According to Article 52 of Additional Protocol I of the Geneva Convention, "Civilian objects shall not be the object of attack or reprisals. Civilian objects are all objects which are not military objectives....military objectives are limited to those objects which by their nature, location, purpose, or use make an effective contribution to military action and whose total or partial destruction, capture, or neutralization, in the circumstances ruling at the time, offers a definite military advantage." *Geneva Convention, Additional Protocol I, Article 52 (8 June 1977)*, <http://www.unhchr.ch/html/menu3/b/93.htm> (accessed 10 April 2008).

Furthermore, the *San Remo Manual on International Law Applicable to Armed Conflicts at Sea* states that "attacks must be limited strictly to military objectives. Merchant vessels and civil aircraft are civilian objects unless they are military objectives in accordance with the principles and rules set forth in this document. International Institute of Humanitarian Law, *San Remo Manual 5*, para 41 <http://www.icrc.org/IHL.nsf/52d68d14de6160e0c12563da005fdb1b/7694fe2016f347e1c125641f002d49ce!OpenDocument> (accessed 21 April 2008). The protection of our airlift assets require a stated and visible purpose of humanitarian aid to convince the world of their non-military character. For detailed information on the principle of distinction and military objectives, see Robertson, *Principle of the Military Objective*, 201-216.

⁵⁶ Although live footage could be ceased through the use of PRC electronic attack (EA), such an act could certainly be conveyed to the world as proof of the hostile intent of China to interfere with humanitarian aid operations.

⁵⁷ West Berliners simply had to go to the Eastern sector and register with Soviet authorities. This measure was also intended to provide a certain amount of administrative control over West Berlin residents that took them up on their offer, thus solidifying their position of authority. Davison, *The Berlin Blockade*, 165.

⁵⁸ According to the document *Notes on the Blockade of Berlin*, issued by British Element of the Central Commission for Germany in 1949, the total number of registrants in the food program never exceeded 86,000. Approx. 11,000 of them lived in areas of West Berlin under the Soviet administrative control. 15,000 were western residents who worked in the eastern sector. Davison, *The Berlin Blockade*, 167.

⁵⁹ Cliff, *Entering the Dragon's Lair*, 96.

⁶⁰ A C-54 in the Berlin Airlift could carry 9 tons of cargo. By comparison, a 747-400F can carry a total of 113 tons. Jane's *All the Worlds Aircraft*, 747-400F, <http://www.janes.com> (accessed 8 April 2008).

⁶¹ This data was obtained from multiple estimates in phone conversations with pilots and logistics personnel at Airborne Express, Inc., Evergreen Air Cargo Services, and Polar Air Freight Corporation. Fueling is done simultaneously with on load/off load. To increase efficiency, some aircraft may be designated as offload only upon reaching Taiwan. Although these figures are a starting point, it is important to realize that a large number of variables can affect our time required. Factors such as equipment available at the airport, who the offloading/on loading equipment operators are, ramp and warehouse space available, etc., must be thoroughly examined when designing an operation to sustain Taiwan via airlift in a crisis scenario.

⁶² Taiwan Bureau of Energy, Ministry of Economic Affairs, Energy Statistics, Coal Consumption, <http://www.moeaboe.gov.tw/English/Statistics/files/CoalConsumption.pdf> (accessed 3 April 2008).

⁶³ Taiwan Bureau of Energy, Ministry of Economic Affairs, Energy Statistics, Petroleum Consumption, <http://www.moeaboe.gov.tw/English/Statistics/files/PetroleumConsumption.pdf> (accessed 3 April 2008).

⁶⁴ Petroleum can be transported by barrel, or through fuel blivets. The M100A1 Advanced Aviation Forward Area Refuelling System (AAFARS) is transportable and consists of twelve 500 gallon blivets. <http://www.janes.com/extracts/extract/jmvl/jmvl9168.html> (Accessed 23 May 2008). This system could be used to refuel required support equipment at Taiwan airfields. Larger amounts of petroleum could be transported through modified aircraft, such as U.S. based Evergreen Airlines 747 Supertanker. This aircraft has a capacity of 24,000 gallons. <http://www.evergreenaviation.com/supertanker/faq.html>. (accessed 23 May 2008). As a last resort, fuel could be delivered through military air refueling aircraft; although the use of military platforms could compromise elements of operational protection for our concept.

⁶⁵ Collier, *Bridge Across the Sky*, 66. Another consideration that must be taken account during more detailed analysis is that deficient resources (esp. petroleum) may impact the ability of farmers to maintain pre-blockade production levels, therefore requiring more imports than normal. Currently, only .9% of Taiwan's energy needs are used to sustain agricultural operations. Taiwan Bureau of Energy, *Energy Consumption by Sector*, [http://www.moeaboe.gov.tw/English/Statistics/files/EnergyConsumption\(BySector\).pdf](http://www.moeaboe.gov.tw/English/Statistics/files/EnergyConsumption(BySector).pdf) (accessed 18 April 2008). Furthermore, our calculations assume that food supply efforts would maintain a diet that is proportionally constant to food consumption before a blockade. If we only consider Table 1 in terms of a requirement to sustain a population at 50% of the total tonnage of food items consumed, regardless of type of food, we can actually reduce our daily delivery requirement by 7,000 MT. Nutritional supplements could be delivered to address dietary deficiencies imposed by airlift imitations.

⁶⁶ *Jane's All the World's Aircraft*, Boeing 747-400F, www.janes.com (accessed 5 April 2008). All subsequent data that refers to 747-400F capabilities is derived from this source.

⁶⁷ Assumption is that refueling will only take place in airfields outside of the ROC due to an anticipated lack of aviation fuel in Taiwan.

⁶⁸ If operational requirements dictate that base airfields for airlift assets are further away from Taiwan than our assumptions, more aircraft will be required to provide an equivalent amount of tonnage delivered.

⁶⁹ *Jane's All the World's Aircraft*, Boeing 747-400F, www.janes.com (accessed 5 April 2008) This potential fleet does not consider 747-400F that belong to the PRC or Taiwan.

⁷⁰ Air Mobility Command, *CRAF Fact Sheet*, <http://www.amc.af.mil/library/factsheets/factsheet.asp?id=234> (accessed 5 April 2008).

⁷¹ As previously discussed, this factor was also recognized by MGEN Tunner in the Berlin Airlift.

⁷² Measures are currently in place to increase the freight capacity at both airports, although not to the level that our concept requires. On 30 April 2008 it was announced that Taiwan Air Cargo Terminal Ltd. (TACT) had signed a contract to expand the air cargo capacity of both Taiwan Taoyuan and Kaohsiung International Airports by an additional 500,000 MT per year at each location. Vogel, "Siemens Mobilises Cargo Facilities at two Taiwanese Airports," *Jane's Airport Review*, 2 May 2008. <http://www.janes.com>, (accessed 22 May 2008).

⁷³ For example, Taipei Taoyuan International Airport's ramp space has 40 positions available for passenger aircraft, and 15 positions available away from the main passenger and freight terminals. Only 10 positions are currently used for air freight. Airlifting additional cargo handling equipment, using ramp space previously used for passenger aircraft, and using taxiways and other locations could significantly increase cargo capacity in a crisis scenario. http://www.taoyuanairport.gov.tw/web/english/about/about_e.jsp (accessed 23 May 2008)

⁷⁴ The western allies had to build new runways, expand ramp space, and build another airfield, Gatow, in the French sector to keep up with the required capacity. Although these efforts did require resources that could have been used elsewhere in the city, the overall capacity of the airlift would have been limited significantly without the improvements. Furthermore, the improvements had the added benefits of providing employment for local residents who would have otherwise been jobless. Collier, *Bridge Across the Sky*, 64, 82-83.

⁷⁵ In first quarter 2007, 15.4% of Taiwan's energy needs were devoted towards the transportation sector. Taiwan Bureau of Energy, *Energy Consumption by Sector*, [http://www.moeaboe.gov.tw/English/Statistics/files/EnergyConsumption\(BySector\).pdf](http://www.moeaboe.gov.tw/English/Statistics/files/EnergyConsumption(BySector).pdf) (accessed 18 April 2008).

⁷⁶ Rand, *Entering the Dragon's Lair*, 96.

⁷⁷ Davison, *The Berlin Blockade*, 331.

Bibliography

- Burles, Mark and Abram N. Shulsky. *Patterns in China's Use of Force: Evidence from History and Doctrinal Writings*. Santa Monica, CA: RAND Corporation, 2000.
- Byrnes, J.F., "Restatement of Policy on Germany," Stuttgart, Germany, 6 September 1946, U.S. Diplomatic Mission to Germany, <http://usa.usembassy.de/etexts/ga4-460906.htm> (accessed 18 April 2008).
- Air Mobility Command, *Civil Reserve Air Fleet Fact Sheet*, <http://www.amc.af.mil/library/factsheets/factsheet.asp?is=234> (accessed 4 April 2008).
- "China Forex Reserves Rose to US\$ 818.9B in 2006." *China Daily*, 16 Jan 2006, http://chinadaily.com.cn/english/doc/2006-01/16/content_512635.htm (accessed 8 April 2008).
- Clausewitz, Carl. *On War*, Translated by Michael Howard and Peter Paret. Princeton: Princeton UP, 1989.
- Cliff, Roger et al., *Entering the Dragon's Lair: Chinese Anti-Access Strategies and their Implications for the United States*, Santa Monica, CA: RAND Corporation, 2007
- Collier, Richard. *Bridge Across the Sky: The Berlin Blockade and Airlift, 1948-1949*. New York: Mc-Graw Hill, 1978.
- Davison, W. Phillips. *The Berlin Blockade: A Study in Cold War Politics*. Princeton: Princeton University Press, 1958.
- Dreyer, June Teufel. "China's Power and Will: The PRC's Military Strength and Grand Strategy," *Orbis* 51, no.4 (Fall 2007): 647-660. www.fpri.org/orbis/5104/dreyer.chinaspowerwill.pdf (accessed 25 March 2008).
- Erickson, Andrew and Lyle Goldstein, "Hoping for the Best, Preparing for the Worst: China's Response to U.S. Hegemony," *The Journal of Strategic Studies* 29, no. 6 (December 2006): 955-986.

-
- Glosny, Michael "Mines Against Taiwan: A Military Analysis of a PRC Blockade" *Breakthroughs*, Spring 2003, 31-40.
<http://web.mit.edu/SSP/Publications/breakthroughs/Breakthroughs03.pdf> (accessed 1 April 2008).
- International Institute of Humanitarian Law, *San Remo Manual* 5, para 41
<http://www.icrc.org/IHL.nsf/52d68d14de6160e0c12563da005fdb1b/7694fe2016f347e1c125641f002d49ce!OpenDocument> (accessed 21 April 2008).
- Jane's *All the World's Aircraft, Boeing 747-400F*, 15 February 2008. www.janes.com (accessed 5 April 2008).
- Jane's *Sentinel Country Risk Assessments: China and Northeast Asia Issue Twenty-one-2007*. Alexandria, VA: Jane's Information Group, Ltd., 2007.
- Jin, Hongbing. "Legal Warfare: Sharp Tool to 'Seize the Opportunity to Grab the Initiative,'" *Renmin Haijun*, Beijing, 29 May 2006. Quoted in Dutton, Peter. "Testimony," U.S.-China Economic and Security Review Commission, *China's Views of Sovereignty and Access Control*.
http://www.uscc.gov/hearings/2008hearings/written_testimonies/08_02_27_wrts/08_02_27_dutton_statement.pdf (accessed 6 April 2008).
- Lewis, John Wilson and Xue Litai. *Imagined Enemies: China Prepares for Uncertain War*. Stanford, CA: Stanford University Press, 2006.
- Marsh, Christopher and June T. Dreyer. *U.S.-China Relations in the Twenty-First Century: Policies, Prospects, and Possibilities*. New York: Lexington Books, 2003.
- Ng, Ka Po. *Interpreting China's Military Power: Doctrine Makes Readiness*. New York: Frank Cass, 2006.
- North Atlantic Treaty Organization (NATO), *2006 NATO Handbook*,
<http://www.nato.int/ducu/handbook/2006/hb-en-2006.pdf> (accessed 29 March 2008).
- O'Hanlon, Michael. "Why China Cannot Conquer Taiwan." *International Security*, Autumn 2000: 51-86. www.proquest.com (accessed 30 March 2008).
- Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), Article 52* (8 June 1977). <http://www.unhcr.ch/html/menu3/b/93.htm> (accessed 10 April 2008).
- Republic of Singapore Ministry of Foreign Affairs, *A Strategic Framework Agreement Between the United States of America and the Republic of Singapore for a Closer Cooperation Partnership in Defense and Security*.
http://app.mfa.gov.sg/pr/read_content.asp?View,4307, (accessed 8 April 2008).

-
- Robertson, Horace B. Jr. "The Principle of the Military Objective in the Law of Armed Conflict." In *International Law Studies*, vol. 72, *The Law of Military Operations: Liber Amicorum Jack Grunawalt*. Edited by Michael N. Schmitt, 197-223. Newport, RI: Naval War College Press, 1998.
- Ross, Robert, "The 1995-96 Taiwan Strait Confrontation: Coercion, Credibility, and the Use of Force," *International Security*, Vol. 25, No. 2. (Autumn, 2000), 87-123 <http://www.jstor.org/> (accessed 8 April 2008).
- Shirk, Susan. *China: Fragile Superpower*. New York: Oxford University Press, 2007.
- Taiwan Relations Act of 1979*. Public Law 96-8, 96th Congress. http://usinfo.state.gov/eap/Archive_IndexTaiwan_Relations_Act.html (accessed April 4, 2008).
- "Taiwan Takes a New Approach." *The Japan Times*, 29 March 2008. <http://www.lexis-nexis.com/> (accessed 31 March 2008).
- Tanner, Murray Scot. *Chinese Economic Coercion against Taiwan: A Tricky Weapon to Use*. Santa Monica, CA: RAND Corporation, 2007. www.rand.org (Accessed 31 March 2008).
- U.S. Energy Information Agency (EIA). *Country Analysis Brief: Taiwan*, September 2006. <http://www.eia.doe.gov/emeu/cabs/Taiwan/pdf.pdf> (accessed 4 April 2008).
- U.S. Energy Information Agency (EIA). *Taiwan Energy Profile*, 24 March 2008. http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=TW (accessed 4 April 2008).
- U.S. Navy. *The Commander's Handbook on the Law of Naval Operations*, Naval Warfare Publication (NWP) 1-14M. Newport, RI: NWDC, July 2007.
- U.S. President. *The National Security Strategy of the United States of America*, March 2006. <http://www.whitehouse.gov/nsc/nss/2006> (accessed April 15, 2008).
- Wang Huqing and Zhang Xingye, eds. *Science of Campaigns* [Zhanyixue]. Beijing: National Defense University Press, 2000. Quoted in Cliff, Roger, *Entering the Dragon's Lair: Chinese Anti-Access Strategies and their Implications for the United States*. Santa Monica, CA: RAND Corporation, 2007.
- Wortzel, Larry M. *China's Nuclear Forces: Operations, Training, Doctrine, Command, Control, and Campaign Planning*. Carlisle, PA: U.S. Army War College Press, 2007.

Websites on Taiwan's Government and Economy

-
- Taiwan Bureau of Energy, Ministry of Economic Affairs, Energy Statistics,
[http://www.moeaboe.gov.tw/English/Statistics/files/EnergyConsumption\(BySector\).pdf](http://www.moeaboe.gov.tw/English/Statistics/files/EnergyConsumption(BySector).pdf) (accessed 18 April 2008)
- Taiwan Ministry of Transportation and Communications, Department of Statistics,
<http://www.motc.gov.tw/mocwebGIP/wSite/np?ctNode=199&mp=2> (accessed 6 April 2008)
- World Trade Organization, *Country Profiles*,
<http://stat.wto.org/Home/WSDBHome.aspx?Language=> (accessed 14 March 2008)