



# Out of the Blue

The TRANSCOM Module for Jaws of the Dragon

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*Rules for TRANSCOM in Jaws of the Dragon*

v3.2



*Evan D'Alessandro*

## *Table of Contents*

Table of Contents .....	2
Required Kit .....	2
Reinforcement Sheets.....	3
Mobilization .....	3
<i>Mobilization, using ground units as an example</i> .....	3
Sea Movement (Ground Units) .....	5
Appendix A: Shipping Available .....	10
Works Cited .....	11
Endnotes .....	13

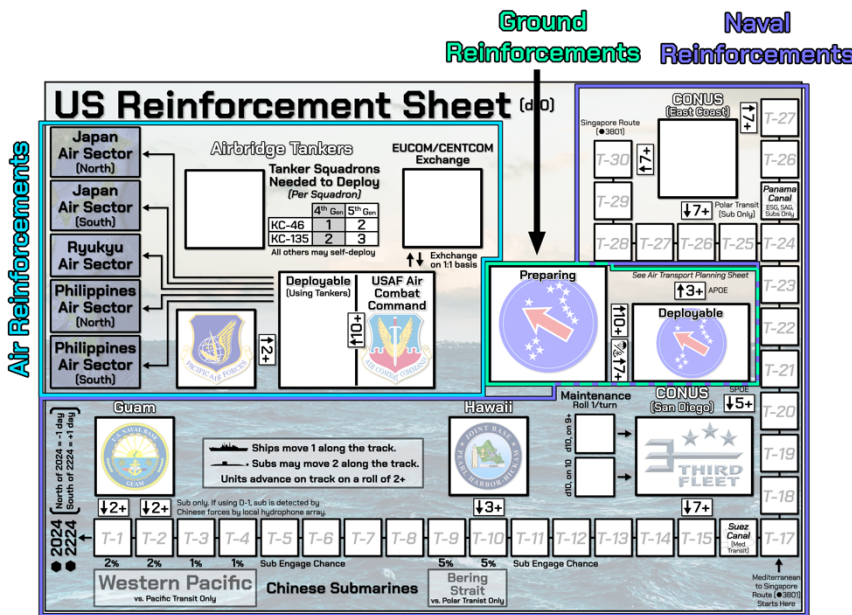
**Note that explanatory graphics may have older versions of sheets or maps compared to current versions. Thus, all values in this document are correct and explanations are correct, but sheets, trackers, and other files may look different than given in this document.**

### *Required Kit*

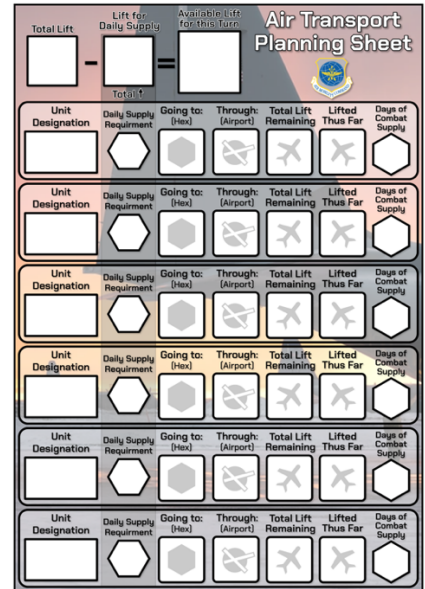
- 1 x Reinforcement Sheet (recommend printing as A2 sized)
- 1 (or more) x Air Transport Planning Sheet(s)
- (At least) 1 x d10's, d4's
- 10-20 x Blank Blocks for marking used airport basing capacity for airlift
- 10-20 x Cubes or other markers to mark RSOI timings
- 1 (or more) x Printed Appendix A: Shipping Available

# Reinforcement Sheets<sup>1</sup>

US reinforcements must flow into theater: a difficult and complex act to achieve. To do so in this game the following sheets are used to allow for Air, Ground, and Naval reinforcements.



The US Reinforcement Tracker



The Air Transport Planning Sheet

The Reinforcement Tracker deals with the strategic mobilization of forces in all domains, while the Air Transport Planning Sheet deals only with airlifted ground units. Once a unit has been successfully deployed, the unit will be placed on the map in the appropriate place.

## Mobilization

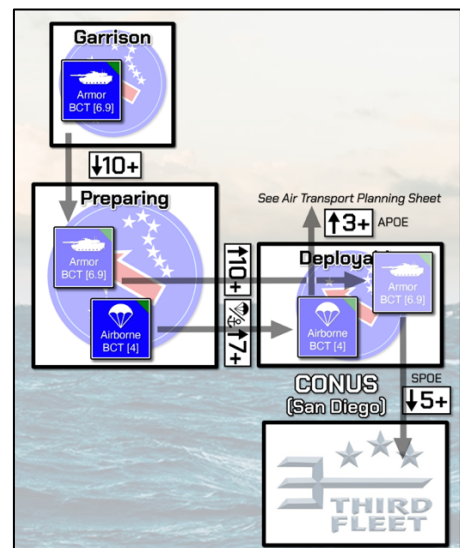
Mobilization refers to movements in the boxes of the Reinforcement Tracker. In this example an Armor BCT and Airborne BCT are mobilizing. While mobilizing, each turn, each unit may roll once to attempt to move to the next box, needing to roll equal or higher to the number in the small box to advance.

*Example: Airborne BCT Movement by Air*

The Airborne BCT starts in Preparing, and as it is an Airborne or Marine unit, it only needs a 7 or higher (7+) to move into the Deployable box. Once it is in the Deployable box, if it wants to move by air, it needs a 3+ to stage at an Air Port of Embarkation (APOE) and becomes available to move on the Air Transport Planning Sheet (covered later).

*Example: Armor BCT Movement to Port*

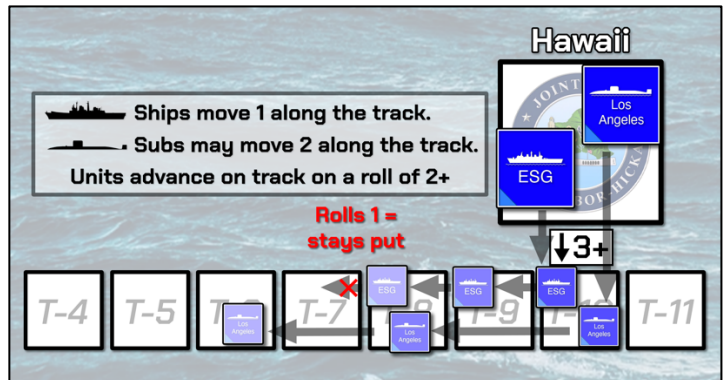
The Armor BCT starts in Garrison and needs a 10+ to move into Preparing. As it is not an Airborne or Marine unit, it needs another 10+ to move into Deployable. After moving into Deployable, it needs a 5+ to move into the 3<sup>rd</sup> Fleet box and become deployable on the Sea Movement Tracker (which has its own 7+ requirement to move onto the Sea Movement Tracker, not shown in this example).



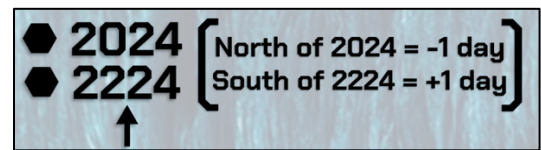
Mobilization, using ground units as an example

## Movement (Sea)<sup>2</sup>

In sea movement, ships (and ground units moving from the US by ship) must first mobilize onto the tracker, then they advance along the tracker each turn on a roll of 2+ (on a d10).<sup>3</sup> Submarines may move 1 or 2 spaces as they wish. In this example, to mobilize out of Hawaii, both the ESG and the Los Angeles must roll 3+. Once they have done so, the Los Angeles may advance down the track at a rate of 2, while the ESG can only advance 1. If the ESG or Los Angeles when trying to advance roll a 1, they may not advance that turn.



Once a unit moves off T-1, they arrive in any hex between 2024 and 2224. If they wish to arrive north of 2024, they arrive a turn earlier, or if they wish to arrive south, it takes an additional day (move them forward or backwards on the track as required).



*The End of the Sea Movement Tracker*

## Reception, Staging, Onward movement and Integration (RSOI)<sup>4</sup>

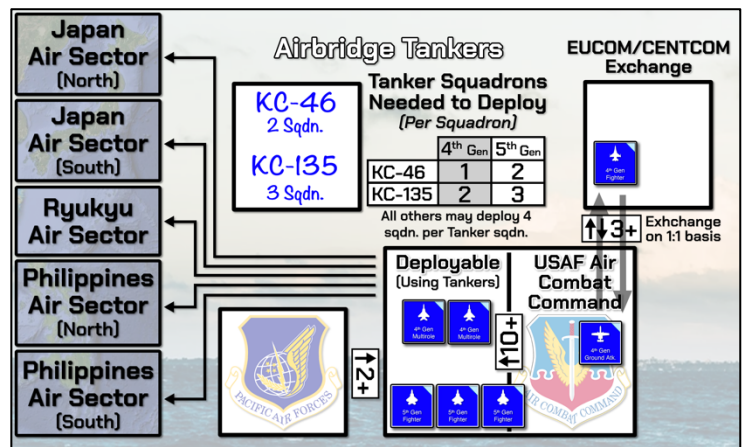
Once a ground unit arrives in theater, they cannot be committed to the fight immediately (exception: ranger regiment, or airborne units conducting a planned and staged joint forced-entry operation). The unit must wait a number of days until available. The basic times are as follows:

Element	Time <sup>5</sup>	Notes
Reception	1 day <sup>6</sup>	Extended proportional to POD damage.
Staging	2d4 days <sup>7</sup>	Can be extended if seriously attacked.
Integration	1 day	Can be extended if seriously attacked.

Mark the unit appropriately until it is available. If the unit is attacked, it may defend at full strength and becomes available for regular use.

## Movement (Air Units)<sup>8</sup>

Air units must mobilize into the deployable box and then must be deployed into the air sectors by using tankers. The number of tanker squadrons required to deploy the given types of aircraft squadrons are shown in the “Tanker squadrons Needed to Deploy” section. Thus, we can see in this example that the 2 available KC-46 squadrons could deploy one 4<sup>th</sup> Gen squadron each, or both could be used to deploy one of the 5<sup>th</sup> gen squadrons.



### Exchanges

There are a number of squadrons that can be “shuffled” by exchanging Air Combat Command Squadrons for currently deployed squadrons in EUROM/CENTCOM. To exchange you

must roll a 3+ per squadron you wish to exchange that turn and then may exchange 1 squadron for one squadron. Exchange may be reattempted even if failed on a given turn.

### **Sea Movement (Ground Units)**

Ground units may move by sea as discussed above by mobilizing into the 3<sup>rd</sup> Fleet box and then moving along the sea movement tracker like other naval units. Units may be escorted by moving them with a naval unit.

#### ***Simple Rules***

A maximum of 2 ground units with sufficient supply for operation may be moved in this manner at a time.<sup>9</sup>

#### ***Complex Rules***

The ships (RRF + MSC) with the lift points become available to move units from the CONUS (San Diego) box as detailed in Appendix A: Shipping Available.<sup>10</sup>

#### ***Sub Engage Chance***

This value represents the ability of Chinese submarines outside of the second island chain to attack ships. The percentage chance is the chance per submarine to be in a position to attack a unit in that area. This means each sub checks once to see if it can engage one unit (and no more than one unit) per turn. If it can, check the detection and attack rules in the combat rulebook for submarines.

#### ***Sub Engage Chance***

This represents the maximum range of Chinese land based AShM to engage ships at sea. Ships in this area or less can be targeted by PLARF assets.

## Air Movement (Ground Units and Supplies)

Movement of ground units and supplies by air is calculated using the Air Transport Planning Sheet. This is filled in to keep track of the units you are deploying or have deployed, how much airlift is sustaining those units and how much is still available, and the amount of combat supply they have.

Air Transport Planning Sheet						
Total Lift 7 Heavy Lift	Lift for Daily Supply 5 Total ↑	Available Lift for this Turn 2 Heavy Lift				
Unit Designation	Daily Supply Requirement	Going to: (Hex)	Through: (Airport)	Total Lift Required	Lifted Thus Far	Days of Combat Supply
1st Brig/82nd Airborne Div	5	0721	MCAS Iwakuni	62	15	0
THADD Battery	0	-	Kadena AB	1 (HLP)	1	3

Example Air Transport Planning Sheet

Note that only Heavy Lift Points (HLP) are currently available, but that the daily supply could be shifted to regular Lift Points to free up HLP if they were to become available. The THADD battery does not deploy onto the Operations Map, so it has no hex number.

## Air Ports of Debarkation/Embarkation (APOD/APOE)

A unit is air landed at an Open APOD, e.g. one of the airports on the map. To open an APOD that is not a US base and use it, on a d8, you must roll higher than the current number of open APOD's.<sup>11</sup> A number of lift points of troops may be landed at an open APOD equal to 3 times the remaining space at the airport (e.g. space not occupied by squadrons). Each APOD can have at most two units landing through it at a time.

**Unit Designation** – The name of the unit.

**Daily Supply Requirement** – How much supply the unit requires per day (in lift points) assuming very little can be supplied locally. See the table below in “Calculating Airlift” for numbers.

**Going to** – The hex the unit will arrive in (if required).

**Through** – The airport the unit is landing at.

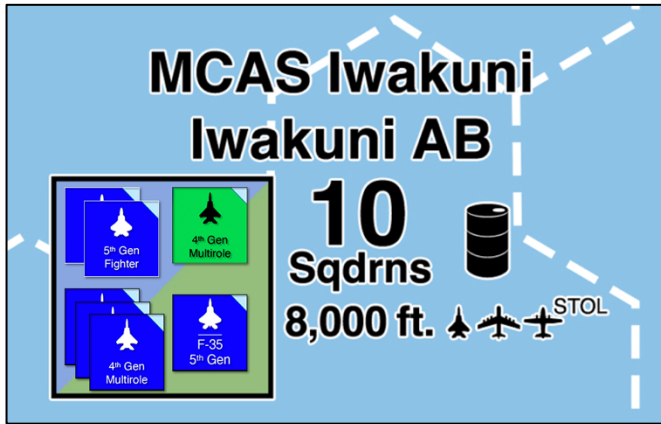
**Total Lift Required** – How many lift points the unit requires to be moved in total. If Heavy Lift Points are required mark with a “HLP”. See the table below in “Calculating Airlift” for numbers.

**Lifted Thus Far** – How many lift points of the unit have been delivered.

**Days of Combat Supply** – How many days of combat supplies have been delivered (distinct from the daily supply requirement). See the table below in “Calculating Airlift” for how many lift points are required to lift a day of combat supply. Each day the unit is in combat reduce its days of combat supply by 1.

To represent the on the ground aircraft of the airbridge, place a blank block for every 3 lift points. If the airbase is attacked, each attrition result on a blank block at the airport destroys one lift point.

With MCAS Iwakuni/Iwakuni Airbase as an example (as seen on the above airlift sheet):



There is space for up to 10 squadrons at the APOD, but there are 7 squadrons based already, so only 3 unused spaces.  $3 \times 3 = 9$ , so up to 9 lift points can be landed at the APOD on a given turn.

When a unit is being landed at an airport, put the unit counter at the airport, and note that the APOD is being used for it by a sticky note on the map.

Note that lift points for daily supply requirement take up space at airbases.

### Calculating Airlift

Lift points are divided into 2 types: Heavy Lift Points (HLP), and Lift Points (LP).<sup>12</sup> HLP represent C-17's and C-5's able to take heavy armored vehicles and oversized/outsized cargo.<sup>13</sup>

Low indicates lift point values required for area where fuel is not easily available, High for area where fuel is easily available. Operating in allies and partners countries is usually considered to be High availability, operating on Taiwan is usually Low availability.

Unit	(H)LP Required <sup>14</sup>	Daily Supply Usage (in LP) <sup>15</sup>		LP Required for Day of Combat Supply <sup>16</sup>	
		Low	High	Low	High
<i>Deployed Area Fuel Availability</i>					
US Armor BCT	162*	5	2/3	22	3
US Stryker BCT	109*	2	1/3	8	2
US Infantry BCT (Airborne)	64	1	1/4	6	1
Marine Littoral Regiment	49	1	.1	2	.5
MDTF	49	1	.1	2	.5
Combat Aviation Brigade <sup>17</sup>	72*	2	.5	3	1
Ranger Regiment	44	1	.2	4	1
THADD Battery	6*		—		1
ACE Squadron Sortie	—		—		2
2 Munitions Cards <sup>18</sup>	1		—		—
MLR or MDTF 1 Missile Reload	1		—		—

\*Only HLP can be used to move this unit.<sup>19</sup>

Also note that 1 point of airlift can (optimally) evacuate ~2,000 people per day in theater, or ~1,000 to the US, though in practice the numbers will be less (and require opening an APOD/APOE for use). This requires an evacuation to be planned and an APOD to be usable for this purpose. Under optimal (or very dire) conditions, these numbers could (again under optimal conditions) be doubled per point of airlift.<sup>20</sup>

## TRANSCOM Airlift<sup>21</sup>

At the start of the game TRANSCOM begins generating airlift assets until they have 23 heavy airlift points to use, following the below progression to find the base value of lift available:

Day	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6+
Available HLP	1+1d3	+1d4	+1d6	+1d6	+1d4	+1d2

You may also call up reservists, grant crew time exemption wavers (allowing normal restriction on crew flight time and rest periods to be ignored), and stage pilots forward. This *multiplies* the given base value for Heavy Lift Points by 1.5 each turn.<sup>22</sup>

One tanker squadron per 2 base Heavy Lift Points is required to use the Heavy Lift Points normally, each HLP not being tanked counts as .75 of a HLP.<sup>23</sup> If required for other purposes, know that in theater (e.g. not for strategic deployment, but for on map use only) is a number of lift points equal to the current turn (max 15) that do not require tankers.

## Activation of the Civil Reserve Air Fleet (CRAF)<sup>24</sup>

USTRANSCOM, with the approval of SECDEF or designee, may activate any stage of Civil Reserve Air Fleet (CRAF) during national emergencies and defense-oriented situations when expanded civil augmentation of military airlift is required.

The selected aircraft from U.S. airlines, contractually committed to the CRAFT, support United States Department of Defense airlift requirements in emergencies when the need for airlift exceeds the capability of available military aircraft. This totals 20 Lift Points (not Heavy Lift Points). One or more stages may be activated at a time.

CRAF Stage	Extra Airlift <sup>25</sup>	Effect on Domestic Airlines
Call for Volunteers*	+1	No effect.
Stage I - Committed Expansion.	+2 (+1 <sup>†</sup> )	Minor disruption to domestic air carriers (cargo)
Stage II - Airlift Emergency	+3/4/3**	Some disruption to domestic air carriers (passengers and cargo)
Stage III - National Emergency CRAF Activation.	+2/3/3**	Major disruption to domestic air carriers (passengers and cargo)

\*At control discretion this may be higher, up to a total of 3 lift points from Stage II and Stage III's available lift points<sup>26</sup>

<sup>†</sup>+1 instead if Call for Volunteers has already been done.

\*\* #/#/# indicates the number gotten on the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> days after activation of that Stage.

## Foreign Aircraft<sup>27</sup>

The following number of lift points of Foreign Aircraft are available, though require permission from the various nations to use:

Nation	Military HLP	Military LP*	National Air Carrier HLP	National Air Carrier LP**
Australia	1	3		
Canada	1	2		
France	3 <sup>†</sup>	–		
Japan	2	2		
Philippines	–	1		
South Korea <sup>Δ</sup>	–	–	–	4 <sup>Ω</sup>
Taiwan	–	2		
UK	3 <sup>†</sup>	–		
European Allies	Varies	Varies		

\* Only available in-theater.

†Unless very detailed play is ongoing, this is unavailable as it is needed to support aircraft deployments in theater.

△ Negotiations with South Korea required and are likely to only operate in peacetime.<sup>28</sup>

\*\* Require 10 days to get clearance to be used.<sup>29</sup>

Ω Preleared for augmentation of the CRAF

## *Appendix A: Shipping Available*

Ship	Heavy Lift Points	Day
No Ships on D+1		
No Ships on D+2		
No Ships on D+3		
USNS Carson City	6	D+4
USNS Newport	6	D+5
Adm William Callaghan	43	D+6
Cape Sable	66	D+6
Cape San Juan	66	D+6
USNS City of Bismarck	6	D+7
USNS Cody	6	D+7
USNS Burlington	6	D+8
USNS Guam	7	D+8
USNS Puerto Rico	6	D+9
USNS Trenton	6	D+9
USNS Yuma	6	D+9
Cape Island	45	D+9
USNS Apalachicola	6	D+10
USNS Brunswick	6	D+10
Formerly MV Alakai	7	D+10
Cape Henry	54	D+11
Cape Horn	54	D+11
Cape Starr	66	D+12
Fisher	116	D+12
Cape Isabel	45	D+13
Cape Hudson	54	D+13
Bob Hope	116	D+13
Nelson V Brittin	116	D+13
Cape Orlando	31	D+14
Cape Inscription	45	D+14
No Ships on D+15		
No Ships on D+16		
No Ships on D+17		
No Ships on D+18		
No Ships on D+19		
Denebola	62	D+20
No Ships on D+21		
No Ships on D+22		
No Ships on D+23		

Ship	Heavy Lift Points	Day
No Ships on D+24		
George Watson	118	D+25
Cape Taylor	35	D+26
Cape Cortes	65	D+26
Gary I Gordon	97	D+27
Cape Trinity	35	D+28
Cape Texas	35	D+29
Charles L Gilliland	97	D+29
Leroy A Mendonca	116	D+29
Cape Ducato	50	D+30
Roy P Benavidez	116	D+30
Cape Vincent	40	D+31
Cape Knox	44	D+31
Cape Rise	53	D+32
Cape Race	53	D+33
Cape Kennedy	44	D+34
Cape Edmont	48	D+34
Cape Decision	50	D+34
Cape Douglas	50	D+35
No Ships on D+36		
Cape Domingo	50	D+37
Cape Wrath	89	D+37
No Ships on D+38		
No Ships on D+39		
Cape Victory	40	D+40
Cape Washington	89	D+40

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## Endnotes

<sup>1</sup> The sizing of chances and effects for this module is difficult, as this is an area where I do not have a tremendous anecdote or example to pull off of. The following are the sources I have pulled off of to try to get an approximate answer as to what was possible:

- Resolute Force Pacific (2025) – Operational exercise of 400 aircraft (300 west of the international date line (*other sources*) including for a month of operations across 50 locations (USAF + partners). 60 days before the exercise began Air Mobility Command worked up 25% of its assets for deployment. One of the goals of the exercise was to move all aircraft and cargo into the Western Pacific in 5 days and keep them supplied (unclear if this goal was attained). One other key lesson learned is that pre-positioning of stocks was key. (Rosenberg 2025)
- 50% of the C-17 fleet were committed to Operation Allies Refuge (Kitfield 2022)

<sup>2</sup> Assuming 15 knot speed of ships and 25-35 knots for nuclear submarines. Numbers based on pushed assessment of sprint speed of US nuclear boats, and ship transit speed based on discussion with Dr. Nick Bradbeer (e.g. ship transit at 15 knots as a high but sustainable cruising speed). Distances estimated using the Google My Maps distance tool. US East Coast forces are considered to be based in Norfolk, US West Coast Forces in San Diego.

<sup>3</sup> This is due to the need to create friction to vary the exact time of arrival. This roll may represent the need to move slower to conserve fuel, need to divert to meet up with other ships or avoid potential threats, bad weather slowing ships, or the need to take actions to decrease the Chinese ability to detect ships.

<sup>4</sup> (Center for Army Analysis 2016) pg. 23. My feeling is that these are probably optimistic, but it is the data I have.

<sup>5</sup> (Center for Army Analysis 2016) pg. 23, see also goal for APS units to be ready in 7 days (Headquarters, Department of the Army 1999) pg. K-11

<sup>6</sup> Also validated by (Military Surface Deployment and Distribution Command 2011) pg. 56 (see offload times on table 6)

<sup>7</sup> (Center for Army Analysis 2016) pg. 23 states 2 days. During Desert Storm battalion sized units averaged 9-17 days to stage (Headquarters, Department of the Army 1999) pg. 4-1. Given in the Pacific only a few units are going to be brought in, and they would likely be more main efforts than moving divisions, a smaller random time to state (2d4) is used.

<sup>8</sup> Based on (US Air Force 2018), pg. 18-19, and open-source ferry range and fuel tank size (assuming drop tanks when possible) of US aircraft. Full Excel file is available upon request.

<sup>9</sup> E.g. representing there is a limited amount of sealift available.

<sup>10</sup> Available shipping from (Military Sealift Command 2025), with data on homeports and sizes from various sources. Sizes converted into lift points based off of average Sq Ft and Ston values in (Military Surface Deployment and Distribution Command 2011) pg. 2. Due to missing data, it is assumed that the Cornelius H Charlton and SLNC Star are not available (for an otherwise very respectable 96% availability rate of ships, which is optimistic).

Transit times to San Francisco based off of 75% of ship max speed, 16 hour movement through the Panama Canal (Military Surface Deployment and Distribution Command 2011) pg. 58, plus readiness times. For RRF ships this is 5-10 days (Military Sealift Command 2025) pg. 21 plus another 0 to 5 days, for MSC ships this was given as random numbers summed: 0 to 6 days + 0 to 4 days + 0 to 4 days (to produce a bell curve distribution).

<sup>11</sup> The military maintains dedicated units (621<sup>st</sup> Contingency Response Wing) to open and manage APOD's that are not prepared, but this takes time and there are a limited number of

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them. US bases are assumed to be able to function as APODs with some minimal support, and the two groups of 621<sup>st</sup> CRW are assumed to be supplemented by local allied assistance and other US forces in the region.

<sup>12</sup> Each lift point is ~158 tons (each squadron of 9 C-5 or C-17, or 10-11 C-130's (which are doing intratheater lift so have higher sortie rate, with mission capable rates from (Air Force Magazine 2023), pg. 68) and sortie rate via calculating routes off planning assumptions in (US Air Force 2018), of which a full discussion is provided later. Friction factors of ~10-20% have been deployed at various points in this calculation and preceding ones, so this is not wholly precise for any given calculation, and to calculate the number of lifts required for a unit, divide the short tons of the unit by 158 and then multiply the product by 1.25.

<sup>13</sup> This was an important problem during Desert Shield/Storm (Mathews and Holt 1996), pg. 79

<sup>14</sup> Calculated off of numbers given in (Military Surface Deployment and Distribution Command 2011), Table 1. Unit Characteristics (Reduced Configuration), pg. 2. Assumed 20% reduction in effectiveness of airlift from given numbers due to 1) enemy action, 2) the need to disperse equipment and personal in loads for survivability and use different routes/bases, 3) general friction, 4) need to move personal and equipment and supplies for those personal and equipment to support the brigades that are not accounted for on the unit TO&E (for example elements of transport units, administrative staff and logistics personal, medical brigades, engineer brigades, and divisional and corps staff and enablers, etc.). MDTF is assumed to be the same as a MLR.

Movement of a Patriot battalion from South Korea to the Middle East required 73 C-17 flights to do (Idrees Ali [@idreesali114] 2025). A battalion has 4-6 batteries, and 4-6 launchers per battery + 1 radar and +1 command station, so 32-48 battery vehicles were moved plus supporting equipment, personnel, and logistics. Per battery this gives a minimum of ~2.3 flights per vehicle. Given average readiness of a C-17 squadron in the game is 7 aircraft, and a THADD battery has 8 vehicles, this means that 18 flights would be required at a minimum (~2.5 lift points of 7 aircraft each), not accounting for any extra equipment, personnel, and logistics, so more realistically 3 lift points would be required. However, each THADD Battery represents a concentration of air defense assets as they are intended to work together (so likely also *at least* +1 Patriot Battery, which would require one C-5 per launcher (4 at minimum configuration) + radar + control station (Mathews and Holt 1996) pg. 58). During the 1991 Iraqi missile attacks against Israel, within 24 hours TRNASOCM lifted in two Patriot batteries of 4 launchers each requiring 9 x C-141 and 30 x C-5 sorties, approximately 5.5 lift points of 7 aircraft each, so for a single battery ~2.5 (pg. 58). Thus another ~2.5 lift points of vehicles for the battery and munitions would be required, and thus we can say that 5 is the minimum number required for THADD plus a Patriot battery. Adding in friction and the need for further supplementation, we add another 1 to be on the safe side and end up with 6.

Full Excel file is available upon request.

Values rudimentarily checked against number of flights required in Desert Storm for various units in (Mathews and Holt 1996) pg. 42-43, which shows calculated values within the same order of magnitude (though direct comparison is difficult).

<sup>15</sup> Note that daily lift required is not proportional to the amount of the unit airlifted for ease, but this can be explained by additional requirements for flying in units and for stockpiling supplies ahead of time. ABCT, SBCCT, and IBCT calculated from ('ATP 5-0.2-1 Staff Reference Guide Volume I Unclassified Resources' 2020), pg. 264 (assuming 20% normal fuel use to be shipped by air, 1 gallon of fuel is .031 short tons, no ammunition expenditure, 10% of Class I needs to be shipped by air, and 25% of water must be shipped in by air). All others calculated from numbers in (Dunnigan 2003), pg. 513, using conversions based on the number of people in a unit and the type of unit. General friction is assumed to be -15% reduction in effectiveness as laid out above (plus need to move Class X supply as well in combat). Full Excel file is available upon request.

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<sup>16</sup> ABCT, SBCT, and IBCT calculated from ('ATP 5-0.2-1 Staff Reference Guide Volume I Unclassified Resources' 2020), pg. 264 (assuming 80% of fuel has to be shipped by air in low fuel availability, or 10% in high fuel availability, 1 gallon of fuel is .031 short tons, and 25% of water must be shipped in by air). All others calculated from numbers in (Dunnigan 2003), pg. 513, using conversions based on the number of people in a unit and the type of unit. Full Excel file is available upon request.

<sup>17</sup> Assuming 36 UH-60, and 36 AH-64. Values on loads from (Dunnigan 2003) pg. 551, expecting in combat use 80% of fuel expended per sortie, and 50% of weapons, with 1 sortie per day for AH-64, and 2 for UH-60. Daily supply use is based off of .75 sorties per AH-64, and 3 per UH-60, with no weapons expenditure. In both cases in the high fuel availability, used fuel is assumed to be 20% of total carry per sortie.

<sup>18</sup> More precise numbers could be arrived at, but this seems roughly correct from the fact that a single C-141 can carry 8 Patriot missiles (Mathews and Holt 1996), pg. 58. A much more detailed analysis could probably be conducted to determine how many munitions of various types each type of aircraft can hold, but I do not have it in me to do so.

<sup>19</sup> I know that only being allowed to use HLP is somewhat unrealistic as there are elements that could be moved by lighter units, but for representations sake and ease here I keep it to HLP only.

<sup>20</sup> Roughly based on numbers from the Afghanistan evacuation.

<sup>21</sup> Calculated from (US Air Force 2018), assumes a route of CONUS -> Hawaii -> Guam -> Destination, note assumption that planning factors have been updated in line with info from the Gulf War (Mathews and Holt 1996), pg. 70-71. Available airlift available for tasking to the Pacific is 75% for C-5 and C-17 (though not all aircraft in tasked squadrons are available at any given moment) based on C-141 availability rate in Desert Shield (Mathews and Holt 1996), pg. 69-70. C-130's are assumed to be doing intratheater airlift and available at 50% rates. Mission capable rates from (Air Force Magazine 2023), pg. 68. C-130's are assumed to have 13 aircraft per squadron counter (this is to match the amount of space on ground as a fighter squadron to allow for missile attack modeling), and fly ~1.1 sorties a day intratheater. Full Excel file is available upon request.

<sup>22</sup> This was done during Desert Shield/Storm to increase the volume of movement (Mathews and Holt 1996) pg. 39, 71-72. This means that there are more flight hours available both to the crew and that more crews are available. The number given here was come to by modeling the removal of crew time (rest time) from the flight time (and was tested with 2- and 4-hour crew times as well, all of which yielded the same rough result of 1.61 times higher sortie rates) to see the increase in lift as a result. The number is then reduced to 1.5 times higher to account for friction.

<sup>23</sup> Based on (US Air Force 2018), pg. 18-19, all lift point aircraft (C-5, C-17, civilian international aircraft) should have the range to fly across the Pacific or can do so with one stop along the way. It is more efficient (both direct flights and less time on ground for fuel (Mathews and Holt 1996) pg. 74) and risks less overcrowding at key bases to fly directly to the endpoint with tanking, and therefore it is assumed that .5 tankers per military aircraft are required.

<sup>24</sup> On operations during Desert Shield/Desert Storm see (Mathews and Holt 1996) pg. 79-84

<sup>25</sup> Calculated based on #'s and types of aircraft from ('Civil Reserve Air Fleet (CRAF) Capability Summary' 2016). Assuming availability rate of 70%, .5 sorties per day (same as military aircraft, and as per (Mathews and Holt 1996) pg. 48, there is no difference in turnaround or crew rest times compared to military numbers, and CRAF may perform better (pg. 79)), and friction reduction in effectiveness of 10%. Division of aircraft over three days is based on comments from (Mathews and Holt 1996) pg. 80. I would prefer a more recent set of numbers, but this is the only source I can find that gives me the number *and* types *and* stages of activation that each

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aircraft is assigned too. Due to high volatility in aircraft that are covered in the CRAF year to year, I do not think that the age of the source is a major issue however, and that the volatility renders this a reasonable source to use. Volunteers were called for during Desert Storm, which produced 16 aircraft, and a further 17 aircraft were called up with CRAF Stage I activation, so I place a call for volunteers as ½ of the effect of Stage 1 activation, (Mathews and Holt 1996) pg. 42.

<sup>26</sup> See (Mathews and Holt 1996) pg. 87. Total airlift was 40 volunteers by February, with 16 volunteers earlier (Mathews and Holt 1996) pg. 42, so perhaps up to 1.5 lift points or so could be gained on top of the initial volunteers, with a round up to 3 to be nice to the players and as this may be more existential and thus more volunteers.

<sup>27</sup> The US has agreements to receive support from South Korea, Kuwait, and Israel national air carriers as part of existing security arrangements (Graham et al. 2003) pg. A-17. Importantly see discussion on pg. A-17 to A-18, and that “Finally, as was reflected by Kuwait’s carrier in the Gulf War, carriers from countries directly affected by a U.S. military operation are likely to be willing participants in the CRAF program.” (pg. A-18. South Korea supported the US during Desert Storm (Mathews and Holt 1996), pg. 52, as well as US contracted NATO nation carriers (pg. 55).

<sup>28</sup> (Mathews and Holt 1996), pg. 52

<sup>29</sup> Based on approximate values from (Mathews and Holt 1996), pg. 55 (e.g. the 15<sup>th</sup> of November to “late November”).