Flotilla of Small Combatants Executive Summary

1. **Problem Statement.**
   a. **Objective:** Identify the impact that a flotilla of small combatants among the first island chain has on deterring China from attempting attacks on established U.S. and Allied C4ISR, ASM, and Air Defense sites on the first island chain, as well as attacks on U.S. logistics carriers in the Philippine Sea.
   b. **Key issues:**
      i. What is the best method of employing these small combatants in achieving the objective?
      ii. How vulnerable are the small combatants?
      iii. How supportable are the small combatants?
      iv. What composition of ground based sites provides the best use of the small combatants?
      v. What is China's response to these small combatants, i.e. do these small combatants provide adequate deterrence?
2. **Scenario.**
   a. **Geographic region:** First island chain from the southern tip of mainland Japan to the northern tip of the Philippines.
   b. **Time:** 2032
   c. **Road to war:** In 2029, the PRC conducts a rapid and successful occupation of Taiwan and the islands of Natuna Besar, Indonesia, and Palawan, Philippines. US and Allied Nations begin mobilizing forces in the South and East China Seas, honoring a mutual defense treaty with the Philippines and Japan. In 2030, a US DDG is torpedoed in the Philippine Sea by a suspected PRC submarine during an inspection on a PRC flag ship. In response, the US and partner nations declare war on China. The conflict quickly evolves into a maritime war of attrition.
3. **Player Role List**. Players were separated into two teams: Blue Force and Red Force. There was no official command structure within each team, so decision making was a collective effort amongst team members. The game was designed this way to encourage open discussion regarding tactics and strategy. Team sizes were balanced, and depending on player schedules, each team consisted of 3-4 players during each game. While most of the players stayed on the same team throughout the wargame, some did switch sides.
   a. **Player Role Objective(s)**.
      i. **Blue Force**: The Blue Force was charged with dispersing their forces along the first island chain in order to prevent the Red Force from reaching the other side of the island chain (the Philippine Sea).
      ii. **Red Force**: The Red Force, starting in the East China Sea and the Luzon Straits, was charged with penetrating Blue's defenses and reaching the other side of the first island chain.
   b. **Available Resources (to be distributed and used across all game boards)**.
      i. **Blue Forces**: 9 Anti-Ship Missile (ASM) sites, 9 C4ISR sites, 30 small combatant ships
      ii. **Red Forces**: 15 large combatant ships, 18 small combatant ships, 9 submarines
   c. **Relationships.** N/A

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4. **Wargame Description:**
   a. **Wargame Design**:
      i. The wargame started as a closed seminar where each side determined their force laydown on the provided game boards. There was a total of two boards that represented two different geographic regions. One represented the Luzon Straits and the other covered the northern tip of Taiwan to the southern tip of mainland Japan. In this seminar game, each side started with a different geographic region. Once each side determined their laydown, the wargame team annotated where forces were located, cleared the board, and had the two teams switch regions. The two sides then did the same thing but now on the other region. With each team now having completed their force laydown on each geographic region, albeit without letting the other team know what decisions had been made, members of the white cell placed all pieces on each gameboard together. This was meant to show each team whether their respective force laydown plan matched what they expected the other team to do and also what sort of engagements would occur given the laydown. No adjudication took place during this round. A discussion on the capabilities and limitations of each side, as depicted by force laydown and provided game rules, was then facilitated by the white cell.
      ii. The second phase of the wargame was devoted to adjudicating tactical engagements between the Blue and Red Forces. The intent was to test the force laydown that was determined in the previous phase and to see what tactics and strategies were used by both sides in order to meet their objectives. This phase of the wargame was open.
   b. **Wargame Execution**:
      i. The wargaming team devoted the first day to introducing the scenario, describing the game, and going through the seminar game. The next two days were devoted to adjudicating tactical level engagements. A total of four tactical level games were played, with the following breakdown:

      Game 1: Luzon Straits
      Game 2: Northern tip of Taiwan to southern tip of mainland Japan
      Game 3: Some players switched teams to see if different tactics changed game outcomes. Game 2's region was played.
      Game 4: Injects were included and a final game was played on Game 2's region

      Each game went through around twenty turns for each side. Each turn was broken down into three phases: Move, Detect, and Engage, and the order for which side went first during each phase alternated with each turn. An example turn would go through the following phases: Blue Move, Red Move, Blue Detect, Red Detect, Blue Engage, Red Engage. The order would then be switched at the next turn. Since the scenario speaks to Red Forces trying to break through Blue defenses, the games always started with Red going first.
      ii. It was expected that during each turn, Red would move their forces towards their objective which was at the opposite end of the board than where their forces started. Blue Forces were expected to posture themselves appropriately

for both defensive and offensive maneuvers. Additionally, it was expected that Blue would complement their capabilities by using their different game pieces in tandem during attacks.

    iii. All engagements were adjudicated using the Hughes Salvo Model.

5. **Methods, Models, and Tools (MMTs)**.

    a. **Adjudication**: As mentioned above, the Hughes Salvo Model was used to adjudicate all engagements during the wargame. This model was the obvious choice, since the wargame simulated salvo exchanges between forces. The deterministic version of the model was used, so probabilities were not incorporated. All ships had equal staying power and defensive counterfire (even Red's large and small ships), therefore, the only way to take down a ship was to mass firepower against it. Practically speaking, this meant that a single ship could not take down an opposing single ship on its own. If a one-on-one engagement occurred, each ship simply decremented their available salvos (the Hughes Salvo Model we used limited the number of missiles exchanged in each salvo to be the same for all ships). It took at least two ships (or a ship and an ASM site) in a simultaneous attack against a single opposing ship in order to defeat that opposing ship. During the 'Engage' phase, each ship could only attack one target. If an ASM site was used during a tactical engagement, the number of offensive salvos used as input in the Hughes Salvo Model simply increased (a unique and separate Excel file was built for this scenario). The ASM sites could not be attacked via surface assets. This rule was established for two reasons: it was supposed to mimic site concealment and mobility, and it was initially intended to give such an advantage to the Blue Force that Red would need air assets to win the game. Game results turned out to always be in favor of Red, so the second reason for the rule was never realized.

    b. **Player Feedback/updates**: During each turn, a moderator declared the phase and whose turn it was during that phase. During the 'Move' phase of each turn, a moderator would verbally confirm that each side had completed their desired moves before moving on to the 'Deter' phase. The moderator would then ask each side to declare which ships were within detection range, and if any were, which ships they would use to attack those opposing ships that were within range. This finalized the 'Detect' phase. During the 'Engage' phase, adjudication was conducted by a member of the wargaming team via an Excel document that was pre-programmed with the Hughes Salvo Model. The result of the engagement was declared to the players, and the board was updated appropriately.

6. **Key Constraints, Limitations, and Assumptions.**

    a. **Constraints**: Wargame and final brief completed by 13 June 2019.

    b. **Limitations**.

        i. Capabilities and limitations of future weapon systems (i.e. small combatants) are unknown but able to be estimated.

        ii. Future C4ISR capabilities, as well as the actual force structure to enable these capabilities, are unknown.

        iii. Available Red players that have experience with China and its military.

        iv. Logistics requirements for the small combatants are unknown.

        v. Weather conditions are unpredictable and dependent on season.

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      vi. While Blue Force mines and aircraft would be available in reality, they were not played in this game.

   c. **Assumptions**.

      i. Estimated capabilities and limitations of future weapon systems will be developed through analogy with current systems to support this scenario.

      ii. Under the right circumstances (to be incorporated into the game), land-based C4ISR and ASM sites can communicate and coordinate attacks with the small combatants.

      iii. Chinese actions will be made by players trying to meet the game's objective for the Red team.

      iv. Logistics requirements for the small combatants will mirror those of similar, existing ships from a NATO ally country.

7. **Findings.** The following findings are broken down according to the key issues outlined in Paragraph 1:

   a. What is the best method of employing these small combatants in achieving the objective?

      i. **A dispersed laydown of small combatants along the first island chain forced Red to consolidate their forces and attempt to penetrate a single gap in each geographic region.** At the beginning of each round, the Blue Force distributed their forces along the entire first island chain in order to provide some level of defense everywhere. As the Red Force laydown was unknown, this was the logical plan. Knowing that massing firepower was the only way for Red to win, they consolidated their entire SAG in each board and attempted to penetrate Blue's defenses at the weakest point (which, for each board, was the biggest area of ocean between any two islands). The distributed laydown of Blue forces could not defend against Red's order of battle since Blue had limited resources, so Blue attempted to consolidate their forces as well in order to stop Red. This was only a game-ism, but the major takeaway is that if Blue can provide enough defense at each island to force Red to mass their forces, then Blue has just provided a very large target for additional assets (like aircraft) to attack. Thus, the small combatants themselves did not provide the firepower to stop Red, but they provided a forcing function for the overall operational theatre that would create favorable targeting conditions.

      ii. **Unmanned small combatants would incentivize using the small combatants as a forward sensing asset.** The game was designed in a way that allowed a Blue asset to engage a target that was farther away from its own organic detection range through the use of a "data-link" between assets. Because this provided such a big advantage to Blue, the game rules were such that the asset doing the sensing would have to be in range of Red. The risk of losing that Blue sensing asset was too great, however, and Blue never played the game this way. In post-game discussions with the Blue team, they noted that unmanned small combatants would have incentivized playing the game more like the wargame team intended it to be played. This is important since it is the combined use of ASM sites and small combatants that is of interest, and the wargames only saw limited use of combined arms. Additionally, because of the limited resources

given to the Blue team, combining arms at each island would have been the only way of stopping Red without having to pool additional assets from other islands, as was actually played.

    iii. **Island masking can work in each team's favor.** There was one game where Red decided to push through a group of small islands in order to meet their objective. Blue did not have any sensing assets in front of the island, so they could not use their forces to engage Red in an advantageous way. This was definitely bad tactics from Blue, and it demonstrated two things: Red can also use the island geography in their favor, and Blue needs to have sensing assets on the western side of the first island chain.

  b. How vulnerable are the small combatants?

    i. **A dispersed laydown of thirty small combatants along the first island chain left Blue forces vulnerable to attack.** While Blue did not employ their small combatants in the most effective way, it is clear that more surface vessels at each island would be necessary to defend against a larger, localized, Red force. This is because, given two equally capable forces, the Hughes Salvo Model favors the larger force. Blue placed an average of two small combatants at each island, and this was not enough to defend against Red's tactics of concentrating their forces. Additionally, because Blue usually waited for Red to pass the island chain before engaging, island masking and the ASM sites did little to help Blue in their tactual engagements.

  c. How supportable are the small combatants?

    i. **Discussed but not observed/played.** Sustaining the small combatants and the ground-based sites was a point of discussion, but it was not incorporated into the actual game. Supporting a dispersed laydown of both ground and naval forces from Japan to the Philippenes would come with obvious challenges.

  d. What composition of ground based sites provides the best use of the small combatants?

    i. **Blue did not realize a winning strategy in terms of where to place ground-based sites.** Blue was not able to successfully incorporate the ground-based sites into the game. The wargame team believes that this was due to Blue's tactical decision making and was not forced through game rules.

  e. What is China's response to these small combatants, i.e. do these small combatants provide adequate deterrence?

    i. **Red avoided Blue forces and attempted to exploit gaps between islands.** As stated above, Red consolidated their forces and navigated through the largest spaces between islands. While this behavior could have been the result of game rules and may not represent reality, Red successfully employed this tactic in all games (which was equally due to Blue's tactical failures).

8. **Wargame Design Team's Thoughts.**

  a. The Blue Force was given a lot more capability than they actually utilized in the wargame. Using combined arms from both the small combatants and the ASM sites

could have resulted in very different game results. The Red Force had an advantage from the beginning in terms of total missile count, so the only realistic way for Blue to have won would have been to utilize combined arms. The team either never realized this tactic or felt that the risk of extending their sensing reach with a vulnerable small combatant was too great.

b. It is questionable whether the Red Force's tactics of concentrating firepower into a few consolidated hexes would actually be implemented in real life. Coordination between so many surface ships to move as one unit would be very challenging. Additionally, China would know that by doing so, they would create a large target for airborne missiles.

c. While still valid, the findings in Paragraph 7 need to be interpreted through the above comments on each team's tactics.

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