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*See Appendix CEX – Combat Example*  
*See Appendix CST – Combat Shifts & Situations Tables*

*“[Col.] Boyd was famous for a maneuver he called ‘flat-plating the bird.’ He would be in the defensive position with a challenger tight on his tail, both pulling heavy Gs, when he would suddenly pull the stick full aft, brace his elbows on either side of the cockpit, so the stick would not move laterally, and stomp the rudder. It was as if a manhole cover were sailing through the air and then suddenly flipped 90 degrees. The underside of the fuselage, wings, and horizontal stabilizer became a speed brake that slowed the Hun from 400 knots to 150 knots in seconds. The pursuing pilot was thrown forward and now Boyd was on his tail radioing ‘Guns. Guns. Guns.’” – from Aviation-History.com <sup>1</sup>*

**Blacksheep:** Don’t think for a moment that “flat-plating the bird” works in space.

Fighter attacks are always *resolved first* in the Combat Round. *Each Era Fighter Complement* has two attacks (hereafter “Sorties”) per round, either the same enemy unit is targeted twice or two enemy units are targeted once each. When an Era Fighter Complement targets two different enemy units and/or colony defense enhancements, the Complement must be split and therefore, the entire force of the Complement will not be used on each target (i.e. no ‘double duty’). Unless informed otherwise, the Concierge will assume that the Complement is being split in half and resolve each attack that way. When a Fighter Complement places both of its sorties on one target in a round, each sortie attacks at three quarters (75%) of the full strength of the Complement due to concentration and coordination; this is called a Concentrated Attack. The **‘cardinal rule’** of Fighter attacks throughout these rules, is that they are resolved individually by *sortie*.

- ✓ For example, a Fighter Complement of 40 RPs from a single Carrier (this would be a large 1<sup>st</sup> Era Carrier, 80 RPs cost) attacks two targets (one sortie each), so each target would be attacked by 20 RPs of Fighters, but if both sorties were sent to attack one target (the sky would darken if space wasn’t already dark<sup>2</sup>), each sortie would attack with enhanced value, as 30 RPs of Fighters.
  - When Fighter and Ship Missile attacks are resolved, they will be resolved in the order provided. See Combat Resolution, 3 Combat, p. 976, *supra*.
  - As noted in Army of Light, 2 Colleges, pp. 479-480, *supra*, positions may decide *each Combat Round* not to use Enlightenment during Fighter attacks and Enlightenment cannot be used for Ship Missiles.
- **Fighter Combat:** As Fighter Complements are measured in RPs, so is Fighter Combat resolved based on the RP size of the attacking Complement. For each Fighter *sortie*, a ten sided die is rolled, and the result divided by ten. The Effectiveness Roll result is multiplied by the size (in RPs) of the attacking Fighter Complement, and the result is converted directly into a percentage chance to hit.

Finally, an Era multiplier of 1.5 for 1<sup>st</sup> Era Fighters, 2.5 for 2<sup>nd</sup> Era Fighters, and 3.5 for 3<sup>rd</sup> Era Fighters is applied to arrive at the final attack chances. This Era multiplier must be part of the Effects section of the Era Fighter Patents. Final result fractions are truncated.

- ✓ For example, 50 RPs of 1<sup>st</sup> Era Fighters are sent to make a *concentrated attack* on a 1<sup>st</sup> Era Orbital Defense Base. The Effectiveness Roll of the first sortie is 7, which is .7 when divided by ten. The .7 is multiplied by the 37.5 RPs (75%), and converted to

a percentage chance to hit, giving the Fighters a basic 26.25% chance of success.

When the 1.5 First Era multiplier is applied, the final attack chance is 39% of success.

If the position has elected to not use Enlightenment in Fighter attacks, the Effectiveness Roll cannot be rerolled as a “failed die roll” (see *Army of Light and Harsh Mistress*, 2 Colleges, p. 479, *supra*). It is most likely that most Enlightenment used in Fighter attacks will be used in Effectiveness Roll rerolls rather than attack rerolls. This, again, is an area where technology and Doctrinal Templates may be usefully applied. It’s also a judgment call.

Fighters are subject to all of the applicable Era differential Shifts as well (see *Combat Shifts*, 3 Combat, p. 978, *supra*) at +/- 10% per Era. It is possible that a combination of high Effectiveness Roll, a large Fighter sortie, and Era Multipliers might put the odds over 100% (but still resolved at 99%) or less than 1% (but still resolved at 1%).

- ✓ Continuing the previous example: If the 1<sup>st</sup> Era Fighters were attacking a 2<sup>nd</sup> Era Orbital Defense Base, the chance of success is 29% and against a 3<sup>rd</sup> Era Orbital Defense Base, the chances for the 1<sup>st</sup> Era Fighters drop to 19% due to defensive shifts.
- ✓ If 3<sup>rd</sup> Era Fighters were attacking a 1<sup>st</sup> Era Orbital Defense Base, they would receive +20% in Era differential shifts, plus their 3.5 Era multiplier, probably resulting in a nearly automatic success.

The 50 RPs Fighter Complement used in the example above is max for a 1<sup>st</sup> Era Carrier. The down-payment to lay keel for this Carrier is 50 RPs with 50 additional RPs to complete it, plus 50 RPs of Fighters to transfer, requiring a big GDP planet and/or lots of RPs from Cargo Ships and possibly Log Ships to bring Fighters from other colonies. See *Laying Keel*, 3 Construction, p. 675 and *How Big Is Your Flight Stick*, 1 Carriers & Fighters, p. 1050, *supra*.

- Engaged: The first successful attack on a target by Fighters “Engages” the target. Engaged means that 15% times the Era of the attacking Fighters is subtracted from the chance of success of whatever the target was instructed to do for the turn (i.e. attack, retreat) to a maximum of 45%. Era differential shifts are not applied, so 1<sup>st</sup> Era Fighters have the same effect against any Era target. So, any target attempting to retreat from combat, which is Engaged by 1<sup>st</sup> Era Fighters, has only a 35% chance of successfully escaping.<sup>3</sup>
  - ✓ Engaged is not a “hit” (see *A Hit*, 3 Combat, p. 979, *supra*), the target is not destroyed. But it does serve as a sort of partial ‘target disruption,’ p. 1057, *ut infra*.
  - ✓ Engaged results from Fighters do not carryover to the next Combat Round.
    - Imagine being surrounded by a swarm of angry bees. You would be rather ‘engaged’ in swatting and running away as fast as you could go. It is unlikely at that point that you’d be thankful that you didn’t fall into a pool of piranhas with a papercut.

If a Fighter Complement is sent to attack two targets in the same round, the best result that can be hoped for would be that both targets would be Engaged and the chance of either result is lessened significantly by the division of forces. However, Engaging enemy units can be a valuable tactical ability reducing their ability to do anything in a Combat Round and forcing them to potentially use Enlightenment rerolls during the round (see *Harsh Mistress and Army of Light*, 2 Colleges, pp. 478-479, *supra*).

An Engaged ship may still retreat if it makes a successful roll. Retreats occur after Fighters and Missiles.

- ✓ The Engaged result is the reason that Fighter attacks are resolved first in the Combat Round. Even if the system were designed with alternating attacks or non-simultaneous attacks, players would still place their Fighter attacks at the top of the Combat Orders to try to Engage enemy units before they can fire or perform other actions. Players would also group Ship Missile attacks at the top of their Combat Orders so that the missiles are fired before their units are destroyed. Thus, it is a natural consequence. Compare also Engaged effects to FAP Assignment effects, 7 Combat, *supra*.
- A Hurt: A target cannot be Engaged twice in the same Combat Round. A second successful attack on the target by any Fighter Complements *in the same Combat Round* results in a hit and the target is destroyed (see A Hit, 3 Combat, p. 979, *supra*). However, as combat is considered simultaneous (*Id.*), all units get to fire – or try to do whatever they were assigned – regardless of whether or not they are destroyed; therefore, a unit that is hit by Fighters was Engaged first, and the Engaged result applies to the unit’s last fire before being removed.
  - ✓ “The passing is only noticed if the puck ends up in the net.” – Bob Errey, Pittsburgh Penguins broadcaster, January 21, 2020.
- A Home Run: Fighter attacks can be analogized to baseball, where base hits and walks mean little – other than potentials and defense distraction – until they cross the plate and become runs. That’s when the walks and errors hurt.

Note that a unit may be Engaged by Fighters and Ship Missiles (see Fire-and-Forget, 4 Carriers & Fighters, p. 1080, *infra*) an infinite number of times, as long as Fighters or Ship Missiles do not score a second success against it in a Combat Round while it is Engaged (the LOB and RISP stats in baseball) and it is not destroyed by any other means. Some units may be very lucky.

- ✓ In the top of the 1<sup>st</sup> inning of the Pirates baseball broadcast on May 30, 2019, Steve Blass noted that more hitters are taking advantage of defensive shifting to hit the ball through the vacated side of the field to get on base. The next batter then hit a home run, making the score 2-0 in favor of the Brewers. The Pittsburgh Pirates broadcasters have been on this issue for years (see 2 Dreamtime, EN 6, p. 156, *supra*); Steve Blass wondered if this would be a trend, whether hitters would be ‘willing to give up their power swing to hit the ball the opposite way.’<sup>4</sup> This is not a bad analogy for Engaged results in GGDM fighter combat vs. hits by regular units in combats.
- ✓ The very next inning, the Pirates nearly did the same. Josh Bell hit a broken-bat blooper into the area vacated by the defensive shift to reach first base; rookie Brian Reynolds then nearly hit a HR on the next at-bat except that it hooked just foul instead down the first base line. Brian Reynolds finally hit a single moving Bell to third. Pirates hitters then burned about 10-15 pitches from the Brewer’s starting pitcher (balls and fouling off pitches), ended up with a run scoring single by the catcher Elias Diaz, with only one out. The Pirates pitcher Joe Musgrove then almost hit a homerun down the baseline with two outs, but it hooked foul into the same area as the previous almost homerun by Reynolds. And so it goes. All of this could easily analogize into a GGDM Combat Round involving fighters and regular units.

- **Encounter with Bright Lights:** Positions may choose to not use Enlightenment in their Fighter Attacks. The game mechanical reason is because two successes are required for a Fighter Attack to score a hit on a non-Fighter target (i.e. ship or base) as opposed to attacks by other units in a Ship or Colony Combat that require only one success to score a hit.

However, consider that if an Enlightenment is used to reroll a missed first attack by Fighters, and the reroll successfully Engages the target, that use of an Enlightenment has the effect of both preserving the possibility of obtaining a Hit if the second attack is successful, and the Engaged result means that the target unit has a 15%, 30% or 45% less chance of doing *whatever* (to a minimum of 1%) during the Combat Round and will not be able to resupply from Log Ships during the Combat Round (see Combat Resupply, 4 Movement, p. 868, *supra*).

Thus, the use of Enlightenment in Fighter attacks is a matter for judgment (see also previous discussion of rerolling Effectiveness Rolls, p. 1054, *ut supra*), and may be the only means to use an Enlightenment to abrogate an enemy hit (remember, Enlightenment cannot be used to force an opponent to reroll a hit). Positions (or specific fleets) that rely heavily or primarily on Fighter swarms may need to use Faculties for Fighter attack rolls.

- ✓ However, see Web of Night, 2 Colleges, pp. 477-478, *supra*, for discussion of application of Faculties to drone fighters.
  - “The Seraphs ... were an alien race in the original Battlestar Galactica series from 1978/79 ... They were never expressly referred to by name in the series, but were called ‘Seraphs’ in the scripts for the episodes in which they appear.... The Seraphs were a noncorporeal race of sentients who first appear in ‘War of the Gods.’ ... The Ship of Lights is a Seraph spacecraft from the original Battlestar Galactica television series. It emits an extremely loud sound that can be heard by people in nearby spaceships and is sufficient to render humans unconscious. The Ship of Lights also carries smaller craft. In the reimagined series, this vessel appears in a painting created by Starbuck. In addition, that series’ Resurrection Ship restores characters (Cylons) to life, and in both series Lieutenant Starbuck/Kara Thrace is part of a resurrection-related plot that leads the characters toward Earth.” – from Wikipedia article, “Seraphs,” captured August 10, 2019.

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*“Attrition warfare is a military strategy consisting of belligerent attempts to win a war by wearing down the enemy to the point of collapse through continuous losses in personnel and material. The war will usually be won by the side with greater such resources. The word attrition comes from the Latin root **atterere** to rub against, similar to the ‘grinding down’ of the opponent’s forces in attrition warfare.”*

– from Wikipedia article, “Attrition Warfare,” August 10, 2019 <sup>5</sup>

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**Strategic Attrition Warfare:** Executed properly, Carriers are strategic attrition warfare (SAW) in GGDM.<sup>6</sup> It takes a different sort of mind to commit exclusively to Carriers & Fighters and make it work.<sup>7</sup>

For most players, Carriers & Fighters will be an addition to old line standard capital ship fleets, providing a combined arms approach. Getting a hit on a single die roll is more comforting.

- ✓ In baseball, a pitcher can pitch so that the hitter cannot hit the ball – inducing swings and strike calls (i.e. a strike-out pitcher) – or a pitcher can pitch so that the hitter can hit the ball but not contact well, either a pop-up or an infield ground ball (i.e. a contact pitcher). They are different mindsets: The former is based on the pitcher’s ‘stuff’ while the latter places trust in team defense. There have always been successful pitchers of both sorts, but modern pitch counts, analytics, defensive shifting, and in the National League, pinch hitting have complicated the pitcher...um, picture.

Consider however, the shift in naval warfare in WWII, the center of a modern fleet or strike force is no longer the big old battleships; CVs and usually CVNs (i.e. aircraft carriers) are the center of a circular naval formation stretching 30 to 50 km (e.g., the tabletop board game, *The Hunt for Red October* (1988), WWII scenario).

Fighters do not require a shipyard, but Carriers and all other ships do. Any colony that has at least 1 RP GDP can produce Fighters to replace losses. Protection and preservation of Carriers is paramount, live to fight another day.

However, Fighter attacks in Combat, fighter ‘tactics’ are small unit maneuver warfare:

- ✓ “Maneuver War is different. While Attrition War is fought to destroy the enemy’s ability to fight, Maneuver War is fought to destroy the enemy’s will to fight. This is not as easily measured as Attrition War, however, the effects of Maneuver War can be devastating. Desert Storm was an example of Maneuver War on a grand scale. ... *A practitioner of Maneuver War frequently goes around main battle units, infiltrating or breaking through the enemy battle line. Once behind enemy lines the Maneuver Warfighter attacks the enemy support structure, headquarters, or whatever is available. Frequently a target is already decided before the penetration. By attacking the enemy’s rear, the enemy’s morale is attacked.*” – Military Science Fiction (blog), “Types of War,” user Warcat, July 29, 2015 (emphasis added).
- ✓ “There are many differences between Maneuver War and Attrition War that are not obvious to the beginner. The easiest way to understand this is that in Attrition War soldiers are trained to follow orders, not to think for themselves. Officers are the ones who make plans and give the orders, synchronizing the operation so it is successful. In Maneuver War it is the small unit leader, the platoon commander, the squad leader who uses the natural chaos of the battlefield to seize an advantage. In Maneuver War a leader may not wait for orders before taking action.” *Id.*<sup>8</sup>

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**Confessions of a Killer** [woman calmly speaking into the camera]: “*Of course I killed them, I just aimed, shot, and killed those little creeps myself. ... Their kind deserves to die!*” – 1990 spray pesticide TV commercial

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**Close-in Defense Weaponry**: Close-in Defense Weaponry are systems originally designed to repel asteroids and space debris that have been adapted and refined to ward off Fighter attacks (alert, *flimsy premise*). There is no Patent for Close-in Defense Weaponry, ships, bases, and boats automatically have Close-in Defense Weaponry installed when they are constructed.



Of course, Close-in Defense Weaponry on a ship is very much like Defense Bases on a colony, it cannot go out and attack the Fighters, the system can only fire in defense when the ship is attacked. Positions may develop Patents to improve the operation of Close-in Defense Weaponry systems.

- ✓ Having Close-in Defense weapons does not make any ship a warship; they are defensive weapons only and do not grant the ability to initiate combat. Close-in Defense Weapons do not create a credible threat to anything but attacking Fighters.
- Tail of the Gunner: Whenever *any* ship or base is attacked by Fighters it will automatically return fire with Close-in Defense systems, regardless of the result of the Fighters' attack. Close-in Defense will automatically fire whenever the unit is attacked by Fighters or Ship Missiles, and however many times are necessary in a Combat Round, regardless of whether the ship owner has submitted Combat Orders or whether the ship is involved in the combat. Each ship or base attacked gets one Close-in Defense Fire at all of the attacking Fighters, divided into *attempts*. Close-in Defense Fire does not prevent or substitute for the unit's regular attack or activity, if it is still capable of making one. A ship or base attacked by Fighters gets one attempt to hit every unadjusted 10 RPs of attacking Fighters (rounded up) at *half* of the ship or base's normal chance to hit based on Era (see Combat Shifts, 3 Combat, p. 978, *supra*), and the sum of all attempts to hit is the Close-in Defense Fire of the unit in that instance. Engaged results on the target unit do not affect Close-in Defense rolls and Era differential shifts are applied *before* halving.
  - ✓ For example, a 3<sup>rd</sup> Era Warship (base chance 70%) would have a 35% chance to hit every 10 RPs of 3<sup>rd</sup> Era Fighters.
  - ✓ All Shifts are applicable to Close-in Defense fire at Fighters (see 3 Combat, *Id.*), *before halving*, for example, a 3<sup>rd</sup> Era Warship firing at attacking 1<sup>st</sup> Era Fighters would have a 45% chance to hit every 10 RPs of 1<sup>st</sup> Era Fighters.

Based on the 'origin' of Close-in Defense Weaponry (*ut supra*) the game assumes – strictly for convenience – that all ships have it, including non-warships (e.g., Cargo Ships, Log Ships, Colony Ships). There is probably no reason for Orbital Platforms, other than Defense Bases, to have it and certainly unfinished ships will not have Close-in Defense Weaponry. However, as non-Warships cannot initiate combat, it is suggested that non-Warships defend in Close-in Fire *as Era Warships*, but the Fighters receive one Defensive Shift.

- Counting Whale Tails: For purposes of Close-in Defense Fire, only actual RPs of attacking Fighters is used, not enhanced RPs from Concentrated Attacks. This makes a big difference:
  - ✓ For example, a Carrier with 40 RPs of Fighters sends both sorties to attack one Defense Base. Each sortie is 20 RPs, but because it is a Concentrated Attack, each sortie attacks at 30 RPs (three quarters of the total value of the Fighter Complement). However, Close-in Defense Fire only gets four attempts to hit (40 RPs divided by 10) and not six attempts to hit (60 RPs divided by 10) because only the actual RP value of the attacking fighters (not the enhanced value) counts.
- Down in Flames: For each Close-in Defense *success*, one ten-sided die (1d10) is rolled, and the result is the number of RPs of Fighters lost to the Close-in Defense Fire. The die roll range is from 1-10, minimum damage is 1 RP. If the Fighter attack is a Combined Fighter

Attack, the damage will be applied proportionally based on the contribution of each Fighter Complement to the total attack value.

In some rare instances, especially with smaller Fighter attacks, the entire attack might be wiped out by some lucky Close-in Defense Fire, but overall, most of the Fighters will live to fight another round. However, massive Fighter attacks will take more losses overall balancing out their better chance of success.

- ✓ For example, 60 RPs (actual, *ut supra*) of 1<sup>st</sup> Era Fighters attack a 3<sup>rd</sup> Era Warship. Regardless of the results of the Fighter attack, the target will get six Close-in Defense fire rolls, with a 45% chance to hit each time. With average luck, the target will hit three times, each time, destroying from 1-10 RPs of fighters. With the most extraordinary luck – six hits – the attacking Fighters could be nearly wiped out.

Although participants, with visions of WWII footage in mind, may envision people in turrets firing Close-in Defense against attacking Fighters, it is most likely that Close-in Defense will actually be handled automatically by computer. Thus, *Enlightenment should not apply to Close-in Defense fire*. If you consider this incorrect, consider further the number of uses of (i.e. demands upon) Enlightenment in each Combat Round already – and be relieved that Enlightenment is not being eaten by Close-in Defense fire.

- **Battle at Planet Midway:** Carriers have a special love-hate relationship with Fighters; Carriers have superior Close-in Defense Weapons to ward off counter attacks by enemy Fighters. As such, the Carrier's base chance to hit in Close in Defense Fire is the same as a **regular warship** of the same Era – applying Era shifts and *not halved* – and when the damage die is rolled for a successful Close-in Defense Fire hit by a Carrier, one is added to the die roll if the Carrier is 1<sup>st</sup> Era, two is added to the die roll for a 2<sup>nd</sup> Era Carrier, and three is added to the die roll for a 3<sup>rd</sup> Era Carrier. However, the total damage from any single Close-in Defense damage die roll can never be greater than 10 RPs.
  - ✓ Continuing the example, if the target were a 3<sup>rd</sup> Era Carrier, the Carrier would have the same chances to hit as the 3<sup>rd</sup> Era Warship against a normal target, but would receive +3 on the damage die roll for each hit, with a max result of 10. Thus the minimum damage for each roll is 4 RPs. Likely, the 1<sup>st</sup> Era Fighters will be decimated.

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*“Because of this statement, reinforced by another more detailed report, issued on 10 August, there was a mindset in the ranks of the Luftwaffe that the RAF would run out of frontline fighters. The Luftwaffe believed it was weakening Fighter Command at three times the actual attrition rate. Many times, the leadership believed Fighter Command's strength had collapsed, only to discover that the RAF were able to send up defensive formations at will.*

*Throughout the battle, the Luftwaffe had to use numerous reconnaissance sorties to make up for the poor intelligence. Reconnaissance aircraft (initially mostly Dornier Do 17s, but increasingly Bf 110s) proved easy prey for British fighters, as it was seldom possible for them to be escorted by Bf 109s. Thus, the Luftwaffe operated 'blind' for much of the battle, unsure of its enemy's true strengths, capabilities, and deployments. Many of the Fighter Command airfields were never attacked, while raids against supposed fighter airfields fell instead on bomber or coastal defence stations.*

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*The results of bombing and air fighting were consistently exaggerated, due to inaccurate claims, over-enthusiastic reports and the difficulty of confirmation over enemy territory. In the euphoric atmosphere of perceived victory, the Luftwaffe leadership became increasingly disconnected from reality. This lack of leadership and solid intelligence meant the Germans did not adopt consistent strategy, even when the RAF had its back to the wall. Moreover, there was never a systematic focus on one type of target (such as airbases, radar stations, or aircraft factories); consequently, the already haphazard effort was further diluted.”*

– from Wikipedia article, “Battle of Britain,” captured November 7, 2019 <sup>9</sup>

**Battle of Churchill Sol B:** The situation described above is shown in the 1969 movie Battle of Britain. The Luftwaffe command believed they had destroyed 300 British RAF aircraft on the ground and in the air, about half of the estimated total strength (movie dialogue). Yet, the British kept intercepting their bomber attacks, and from this, they concluded that the British had moved all of their reserves to the south of England to keep up the battle front, and thus Scotland and Northern England were unguarded. Thus, on August 15, 1940 (two days after Eagle Day), they launched a massive bomber attack from Norway beyond fighter escort range, with unescorted Heinkel III bombers and ME110 Fighter Bombers, and as they approached the English northeast coast, they were attacked in strength by Spitfire squadrons that were not supposed to be there!

- ✓ The resulting bomber losses were called the Black Thursday of the Luftwaffe, see <http://ww2today.com/15th-august-1940-the-luftwaffes-black-thursday>.

Overestimation of both enemy strengths and losses are common in all wars in all ages. It is important to be skeptical of your own intelligence – both the military-espionage and wetware kinds.

- ✓ “Overclaiming in aerial warfare is not uncommon. During the Battle of Britain (and, indeed, the rest of the Second World War), both sides claimed to have shot down and destroyed more enemy aircraft on the ground and in the air than they had in reality. RAF Fighter Command claimed 78 German aircraft shot down on 13 August 1940. Another source states that official RAF claims amounted to 64. Actual German losses amounted to 47–48 aircraft destroyed and 39 severely damaged. Conversely, the Luftwaffe claimed to have destroyed 70 Hawker Hurricanes and Spitfires in the air and a further 18 Blenheim bombers in the air alone. This was an exaggeration of about 300 percent. Another 84 RAF fighters were claimed on the ground. Actual RAF losses in the air amounted to 13 fighters and 11 bombers, with 47 aircraft of various kinds on the ground.” – from Wikipedia article, “Adlertag,” captured November 7, 2019.
- ✓ [Interview] “The Germans were flying what they termed ‘free hunts’ – 100 to 150 fighters sweeping over southern Britain hunting out the Hurricanes and Spitfires. The instruction went out to our pilots not to engage these fighters unless they were escorting bombers. So, the myth started to grow that the Royal Air Force was being depleted and defeated.” – Chris Wren, Curator RAF Operations Room, Uxbridge, 13 Hours that saved Britain (documentary, 2011).

Thus, it is possible (especially if participants don’t see the die roll results) to over- or under-report *enemy* Fighter RP losses in every Combat Round; the owner of the Fighter RPs will, of course, receive accurate reports of their losses and current strengths. It is possible because of the

speed and confusion of high-speed combats, destruction of hardware systems, and because biological sapience is involved. There may even be some deception by the attackers. However, on the other side, an argument can be made – especially given GGDM’s generous detection rules – that advanced technology and open space should mean that everything should be accurately detected and reported by computer-controlled surveillance systems, especially if they are AI.

- ✓ Which side of the coin lands face up will need to be decided by participants before the game begins. First, it must be decided if participants will see die roll results; if they do, then all other questions are moot. If participants cannot see die roll results, the Concierge has more room to operate (and this applies to all parts of the game).

There are two possible ways to handle this. The computer assistant could be set to automatically determine the accuracy of reported *enemy* Fighter RP losses and determine the over- or under-reporting within a set range of percentages. Or it could be set so that reporting is accurate unless the Concierge uses an Intervention to alter the reports.

This then may raise a further issue about possible over- or under-reporting of enemy ship losses (which is possible); however, the difference is that ships are *game units* whereas Fighter RPs are *enhancements* that land on a ship. So they are not quite the same; ships would be seen with fair certainty in GGDM’s detection scheme. Finally, the thoughts here regarding reporting of enemy Fighter RP losses could be extended to enemy Ship Missile use (see Torpedoes at Trafalgar, 4 Carriers & Fighters, p. 1079 *et seq.*, *infra*), and also Ground Combat damage (see Ground Combat Resolution, 4 Combat, p. 993, *supra*), if participants cannot see the die roll results.

- ✓ See also Krypton Kerfuffle discussion, 1 Taxation & Census, p. 298, *supra*.

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*“Awareness of the dynamic interrelationship among dispersion, mobility, and firepower led to the development of further measurement scales, and subsequently to the QJM model, and later the TNDM.”*

– Susan Rich [referring to the Quantified Judgment Method and T. N. Dupuy Associates Inc.], biography page for Trevor N. Dupuy at The Dupuy Institute website (<http://www.dupuyinstitute.org/tndupuy.htm>)

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*“Nor is the issue so limited that it can conveniently be reduced to any particular age. Perhaps it would not be too comprehensive a statement to say that all military history is made up of an endless struggle between the principles of dispersion and cohesion. The swing from one to the other has influenced tactics ever since Troy, and Armageddon will probably consist of a bloody clash between the last phalanx and legion left on earth.”*

– Lynn Montross, War Through the Ages (3<sup>rd</sup> Ed., 1960), p. 71

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**Areal Phenomenon:** Fighter Complements cannot be hit if they don’t attack or intercept in the Combat Round, unlike regular units and colony defense enhancements that can be hit in any Combat Round by virtue of being in the Combat.

- ✓ Thus, Fighter Complements assigned to FAP cannot be hit, see A FAP in the Night, 7 Combat, p. 1041, *supra*. FAP is an *alternative use* for Fighter Complements.

Fighter Complements cannot be directly targeted by enemy units in any Combat (including normal Orbital Bombardment, but can take proportional losses), instead, they may only be fired upon by Close-in Defense Fire when they attack or are Intercepted by warships, or by other Fighters via Interception and Dogfighting (see 3 Carriers & Fighters, pp. 1069-1070, 1072, *infra*). Any ships transporting the Fighters may be targeted normally in any appropriate Combat.

- ✓ These are the baseline rules in GGDM; they can, of course, be changed by development of new technologies, such as true areal weapons (see 3 Carriers & Fighters, p. 1073, *infra*) or doctrinal templates. Generally, Fighters are considered to be small, agile, and dispersed over a large volume of space unless they are attacking a specific target; when that happens, they have to come to the target, making them vulnerable to Close-in Defense Fire (e.g., what you see in movies). Only other Fighters, via Interception and Dogfighting, can match the areal phenomenon of a swarm of Fighters.

Think of this as you vs. a swarm of bees or gnats. You are the big warship. You can swat at them, might get one or two, but the bees are gonna sting you, the gnats are gonna get in your eyes, nose, and ears and make that high buzzing sound. Or you can run away, fast. The only place you can ‘get them’ is at their hive (i.e. Carrier or host colony in GGDM). To combat them, you must find better weapons, e.g., I remember a killer ant swarm movie about ants taking over an island, where the humans use flamethrowers against the ants (it may have been the carelessly, grossly misnamed movie, *The Hive* (2008)).

- ✓ “To his mind came the sounds of war across the gulf of space. It was all imagination; in that tomb there was no sound. Yet he could clearly detect the hiss of his scout’s blaster as it poured beam after beam into the lead ship of the Kyben fleet. His sniper-class scout had been near the point of that deadly Terran phalanx, diving like a wedge at the alien ships converging on them in loose battle formation. It was then that it happened. One moment he had been heading into the middle of the battle, the left flank of the giant Kyben dreadnought turning crimson under the impact of his fire-power.

The next moment, he had skittered out of the formation which had slowed to let the Kyben craft overshoot, while the Earthmen decelerated to pick up maneuverability. He had gone on at the old level and velocity, directly into the forward guns of a toadstool-shaped Kyben destroyer. The first beam had burned the gun mounts and directional equipment off the front of the ship, scorching down the aft side in a smear like oxidized chrome plate. He had managed to avoid the second beam. His radio contact had been brief; he was going to make it back to Antares-Base if he could.” – Harlan Ellison (story) and Ken Steacy (art & adaptation), “Life Hutch,” *Epic Illustrated*, Vol. 1, No. 6, June 1981.<sup>10</sup>

Here, “scout” is being used in place of fighter. Generally, participants should avoid (for sanity sake) creating classes of things using names that could be confused with other game terms. And there is no sound in space, unless it’s your ears ringing inside your space suit helmet...

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*“Alpha Squadron, form up on my wing. Delta Squadron, punch us a hole through there!”*

– Lt. Cmdr. Susan Ivanova, *Babylon 5*, “Severed Dreams” (1996)

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**Combined Fighter Attacks:** The power of Fighters is in the masses. A weaker position can mass up sufficient waves of Fighter attacks such as to nearly guarantee the destruction of even the largest and most advanced enemy warship or base. That's not a solution to all strategic ills, but it works sometimes and the cost may be staggering.

➤ **En-Masse:** Two or more Fighter Complements may combine for one or two sorties on any single target. When Fighter Complements combine, the largest Fighter Complement will automatically be designated the Primary (*unless* the Concierge is otherwise instructed) and all others will be considered Supporting. In calculating the attack, the Primary Complement is taken at full value, while each of the Supporting Complements is added at half value.

✓ For example, two Fighter *sorties*, one 50 RPs and the other 30 RPs are combined to attack a 1<sup>st</sup> Era Warship as one *combined sortie*. The 50 RP sortie will be the Primary, and the 30 RP sortie will be added to the attack at half value, for a total attack equaling 65 RPs of Fighters for one *sortie*.

➤ **The Other Shoe Just Dropped:** If the Combined Attack is also a Concentrated Attack (i.e. both sorties are placed on one target), only the Primary receives the Concentrated Attack bonus. Each sortie is calculated individually. To receive the Concentrated Attack bonus, the Primary must have dedicated both of its sorties to one target, but the supporting Fighter Complements may be split and may participate in either or both sorties on the target (*sans* bonus). Thus, if the Fighter Complement making a Concentrated Attack during the Combined Attack is not the largest Complement, the position should specially designate it the Primary (*ut supra*). Failure to do so nullifies the Concentrated Attack bonus.

✓ In the above example, assuming the Primary Complement dedicated both of its attacks to the target (i.e. a Concentrated Attack), but the Supporting Complement only contributed its second sortie, the first sortie would attack (alone) with 75 RPs at three-quarters of the value of the full 100 RP complement and the second Combined-Concentrated Attack, would be at a value of 90 RPs (75 RPs plus 15 RPs from the supporting Complement which did something else with its first sortie).

✓ c.f., if the Complements didn't combine, they could have had two attacks at 50 RPs and two attacks at 30 RPs on any targets, uncombined.

➤ **Daffy Duck Shoot:** A combined Complement acts as one Complement for Close-in Defense Fire purposes, noting that losses from Close-in Defense Fire will be proportioned. Only one Effectiveness Roll will be made for each Combined Attack *sortie*.

✓ Continuing the above example, the *actual* value of the attacking fighters is 130 RPs on that target (that is, 100 RPs from the Concentrated Attack of the Primary Complement and 30 RPs of the Supporting Complement on the second sortie), so the target will get 13 (130 divided by 10) attempts at Close-in Defense Fire against the Concentrated and Combined Attack.

The Concierge will not combine Fighter Complements attacking the same target unless instructed in the position's Combat Orders.

✓ A decent tactic is to have the Combined Fighter Attack on the second Sortie on a target, to insure that the target is Engaged, if the first attack missed, or to enhance the chances of destruction of the target, if the first sortie got an Engaged result, e.g., Fighter Complements A, B, and C. Complements A and B attack two targets, putting

both of their Sorties on their target (Concentrated Attacks). Complement C divides its two Sorties, combining one each with Complements A and B's second Sorties.

**Interviewer:** *Why would an F-16 lose in a combat against an F-35 or other next gen fighter?*

**General:** *Because the F-16 would never even know it was in a fight when the F-35 locked on and fired from beyond its sensor range.*

– Paraphrased from an article discussing next gen fighters <sup>11</sup>

*“In an interesting incidental commentary, most of those contrarian articles say something along the lines of ‘there are plenty of reasons to be critical of the F-35 program, but this isn’t one of them.’ And that captures the problem about much of the public reporting on the F-35. The program has been running almost a decade and a half, with significant schedule slippages, engineering problems, software issues and cost overruns in its early years. The net effect has been to cost the Australian taxpayer many billions of dollars to establish an interim air combat capability. But much of the discussion has been about the wrong thing – yesterday’s concept of air warfare.”*

– Andrew Davies, nationalinterest.org <sup>12</sup>

## Endnotes.

<sup>1</sup> **Citation:** <http://www.aviation-history.com/airmen/boyd.htm>.

<sup>2</sup> **Citation:** **Susan Ivanova:** I’ve always had a hard time getting up when it’s dark outside. **Jeffrey Sinclair:** But in space, it’s always dark. **Ivanova:** [morosely] I know. I know. – Babylon 5, “Signs and Portents” (1994).

<sup>3</sup> **Citation:** See Zigged When He Should Have Zagged, 3 Combat, p. 981, *supra*, base chance of retreating is 50%.

<sup>4</sup> **Commentary:** This is another version of the issue of me vs. us in professional sports. Sometimes the team needs the power swing, other times the team needs base runners. Solo home runs are great, but they don’t add much to the team score. After the first hitter reached base by hitting the ball the opposite way, the next batter hit the ball out of the park to make the score 2-0 in favor of the Brewers.

<sup>5</sup> **Citation:** “OHL had issued orders to change tactics again days before Loßberg was blamed for giving new orders to the 4<sup>th</sup> Army. [Jonathan] Boff also doubted that all of the divisions in Flanders could act on top-down changes. The 119<sup>th</sup> Division was in the front line from 11 August to 18 October and replied that new tactics were difficult to implement due to lack of training. The tempo of British attacks and the effect of attrition meant that although six divisions were sent to the 4<sup>th</sup> Army by 10 October, they were either novice units deficient in training or veteran formations with low morale after earlier defeats; good divisions had been diluted with too many replacements. Boff wrote that the Germans consciously sought tactical changes for an operational dilemma for want of an alternative. On 2 October, [Prince] Rupprecht had ordered the 4<sup>th</sup> Army HQ to avoid over-centralising command, only to find that Loßberg had issued an artillery plan detailing the deployment of individual batteries.” – from Wikipedia article, “Battle of Passchendaele,” May 20, 2020.

<sup>6</sup> **Commentary:** An extreme version of ‘attrition warfare’ was the Aztec concept of the Flower Wars. The Flower War format was a ritualistic meeting of equal forces of warriors from two sides, on a sacred field, for melee combat without missile weapons and using less lethal handheld weapons as the purpose was to capture opponents for sacrifice and ransom. This is not to say there were no casualties or intimidation (the Aztec illustrations are gruesome), and it should not be pictured as chivalric combat in a European sense. The Flower War seems like an extreme extension of the pre-combat hero duels in ancient combats (e.g., David responding to the taunting of Goliath, except David used a missile weapon) but not in a straight gladiatorial sense. Such a system requires agreement between sides – hence it had to become part religious ritual overseen by the priesthood – because all bounds are off if either side breaks the format (ambush with missile weapons, bringing twice the number of allowed fighters, etc.) and it is notable that long-running Flower Wars tended to become nasty, push the bounds, and spillover into general warfare.



- ✓ It would be interesting if such a system developed in a GGDM game, but doing so would require a step toward a pan-galactic culture – development of meanings and protocols embracing such a practice. Science fiction literature – written with the sense of modern warfare and Western technologically enhanced individualism – rarely features ritualistic type warfare or even warfare with any sort of rules; *Dune* hints at ritualized conflict but then crosses over into total war, minus direct use of nuclear weapons. The movie *Rollerball* (1975) features a ritual type warfare in the form of violent modern professional team sports (and there are a number of games based on this concept) which, like *Aztec Flower Wars*, degenerates as the movie progresses into total war between corporate squads. The most notable science-fiction full implementation of ritual warfare of the Flower War type are the annual combats (called the Grand Combat) in Julian May's *Pliocene Saga* (1982) in which human temporal immigrants become increasingly involved.

<sup>7</sup> Commentary: Trench warfare developed in WWI on the Western Front after the initial grand maneuvers failed. It was possible only because of the terrain, the size of the industrial armies, and the relatively straight line from Switzerland to the North Sea. The end of trench warfare eventually crept in as aircraft, tanks, improved artillery coordination, and the new infiltration tactics – invented by a French officer and first used by the Germans – developed and asserted themselves. Infiltration tactics in particular placed new emphasis on small unit commanders' control and decision making. The Battle at Remagen in March 7, 1945, resulting in the capture of the last intact bridge over the Rhine (movie *The Bridge at Remagen* (1969)), is celebrated as a triumph of small unit leadership.

- ✓ In WWI, 'tanks' were used as infantry support vehicles (they looked nothing like modern tanks); they were tied to the pace of the infantry advance, clanking along with the infantry advance. At Cambrai in November 1917, the initial attack dispensed with the usual artillery preparatory bombardment; at dawn the tanks came over the rise and led the attack on the surprised German line which was easily overrun. The infantry came up behind and occupied the enemy trenches, collecting POWs. Within a decade, the German military appreciated the power of tanks, it took a complete turn of thinking to fully engage the potential of tank warfare, demonstrated in 1939 (blitzkrieg). Likewise, it took a complete turn in naval thinking to appreciate the power of the new aircraft carriers and long-range bombers; the Axis powers were behind that curve.

<sup>8</sup> Commentary & Citation: Blitzkrieg was maneuver warfare with a new logistical scheme. The U.S. Marines have always been committed to maneuver warfare and flexible small unit leadership:

- ✓ "Beneath its Prussian exterior of short haircuts, crisp uniforms and exacting standards, the Corps nurtured some of the strangest mavericks and most original thinkers I encountered in my journey through multiple commands and dozens of countries. The Marines' military excellence does not suffocate intellectual freedom or substitute regimented dogma for imaginative solutions. They know their doctrine, often derived from lessons learned in combat and written in blood, but refuse to let that turn into dogma. Woe to the unimaginative one who, in after-action reviews, takes refuge in doctrine. The critiques in the field, in the classroom or at happy hour are blunt for good reasons. Personal sensitivities are irrelevant. No effort is made to ease you through your midlife crisis when peers, seniors or subordinates offer more cunning or historically proven options, even when out of step with doctrine." – Gen. Jim Mattis (USMC Ret.) op-ed, "Jim Mattis: Duty, Democracy and the Threat of Tribalism," *Wall Street Journal*, August 28, 2019.

<sup>9</sup> Commentary: I have wondered how much Rear Admiral Kummert on the KMS *Blücher* knew of the Norwegian defenses when he sailed into Oslo? Did he know about the underwater torpedo tubes, what was he told? They apparently were also surprised by the 11 in. naval guns that hit their superstructure and were unable to locate them in the dark for return fire. All of this suggests very poor intelligence (the infamous *Abwehr*).

<sup>10</sup> Commentary & Citation: I believe that "Life Hutch" is one of five Harlan Ellison-Ken Steacy Earth-Kyber War graphic stories that appeared in *Night and the Enemy*, published in 1987 (republished with additions in 2015) and are now available on Kindle and comiXology.

<sup>11</sup> Commentary: This is the same reason that combat jet pilots in leftover Cold War dictatorships and third world countries flee to other countries rather than face air combat against fighter combat jets from any first class air power; it's not a contest of pilot against pilot, man against man, rather, it's a contest of machines – new cutting edge fighters against obsolete Cold War combat jets – that they know they will lose, die, and accomplish nothing.

- ✓ It is also the same reason that the six-carrier Japanese attack fleet that hit Pearl Harbor in December 1941 would be annihilated by the USS *Nimitz* from 1980. They would never know what attacked them.

<sup>12</sup> Clarification: Regarding reports that an F-35, the most expensive combat jet in history and the next generation of air combat vehicle, was beaten in a dog-fight by an F-16, a combat jet decades older.