

TIGER WINGS

WWII AERIAL COMBAT OVER THE FAR EAST

QUICK START (QS) FLIGHT RULES

1.0 INTRODUCTION

Greetings, this introductory rules set teaches the basics for how to “fly” an aircraft (AC) in this game. These rules focus only on fighter flight and combat. You will not need the actual Tiger Wings (TW) game rules at this time, only this set of rules and the separate QS play aids card. Please note that the TW rules are richer in detail and include explanations, diagrams, “how-to” examples, plus special maneuvers and air-to-ground combat. Hopefully, the QS rules will motivate you to quickly delve into the TW game.

1.1 Getting Started Please gather writing utensils, one blank AC log sheet for each AC in play, two 10-sided dice (D10), the all blue game map with the hex grid printed on it and these two AC data cards (ADCs): The American **P-40B/C Tomahawk** (Flying Tiger P-40) and the Japanese **Ki.43-Ib Oscar**. Find the no. 1 game counter for each of these AC. Each counter has a top view of the AC printed on it. The nose of the AC is pointed at a corner of the counter. On the game map, always orient the counter so that the corner the AC’s nose is pointed at, which indicates its flight direction, is aligned with the appropriate compass direction printed on the map.

1.2 Game Scale & Concepts Each game turn is 4 seconds of flight and each map hex is 100 yards (300 feet) across. One movement point (called a “Flight Point” or FP in TW) equals 50 mph of speed. The game is played in three-dimensions. AC have not only a map position, but also an altitude. AC may only move forward on the game map in the direction their nose is pointed (known as the AC facing), but part of their movement can also involve gaining or losing altitude (climbing and diving).

2.0 SEQUENCE OF PLAY & GAME LENGTH

Each game turn consists of three phases which must always be executed in the same order: The **Initiative Phase**, the **Movement Phase** and the **Combat Phase**. Each QS game lasts 15 game turns.

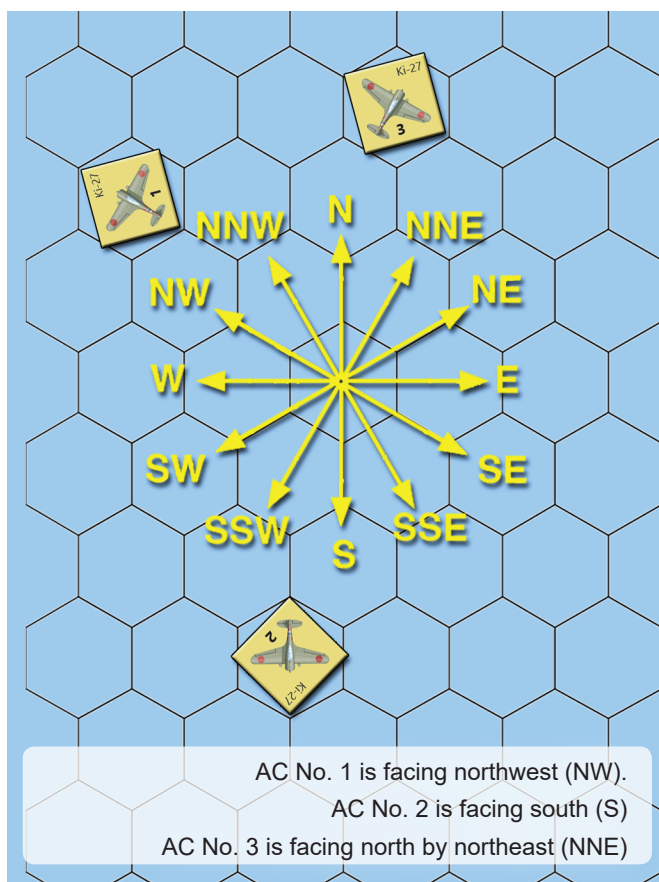
- **Initiative Phase** Initiative represents a pilot’s momentary situational awareness. Each game turn, roll a single D10 for each AC in play. The number rolled is the initiative no. for that AC. If more than one AC has the same number, these must roll a second D10, as many times as needed, to break the tie. Initiative establishes the order of movement for AC each turn, with the lowest numbered initiative always moving first, etc. Moving after other AC is an advantage in play.
- **Movement Phase** AC are moved, one at a time, in the order of their initiative for the game turn. AC move by expending “Flight Points” (FPs) to advance across the game map or to climb or dive in place. Other actions such as banking wings and turning do not cost FPs to accomplish. Each AC’s position, speed, wing bank, nose pitch angle and energy state is tracked from game turn to game turn using the AC log sheet (nothing involves more than simple arithmetic, so don’t worry).
- **Combat Phase** After all AC have moved, players determine if any shots are possible. A fighter may fire on another AC if the target is within its horizontal and vertical gun arcs (fields-of-fire), within effective range of its guns and if ammo remains for those guns. Percentile dice are rolled to resolve the shot. See Combat Rules further below.

3.0 AC SPEED, FLIGHT POINTS AND HALF FPs

In play, AC SPEED is tracked in terms of points and half points. Each 1.0 point of speed = 50 mph (each half point of speed = 25 mph). Each game turn, AC are allotted FLIGHT POINTS (FPs) to expend for movement equal to their start speed (1.0 of speed = 1 FP). However, speed and FPs must be treated as distinct since speed is tracked in increments of 0.5, whereas FPs can only be expended in units of one, termed “full FPs”. Thus, whenever an AC has a start speed with a half in it, the AC will get a “HALF FP”, which may be UNUSABLE in that same turn. If unusable, the half-FP is not lost, but carried forward to the next turn, where, should another half FP be allotted to the AC from its speed, the two half FPs MUST then be joined to provide an extra full FP for the AC to use. Thus, an AC can have more FPs to play in a turn than it has speed.

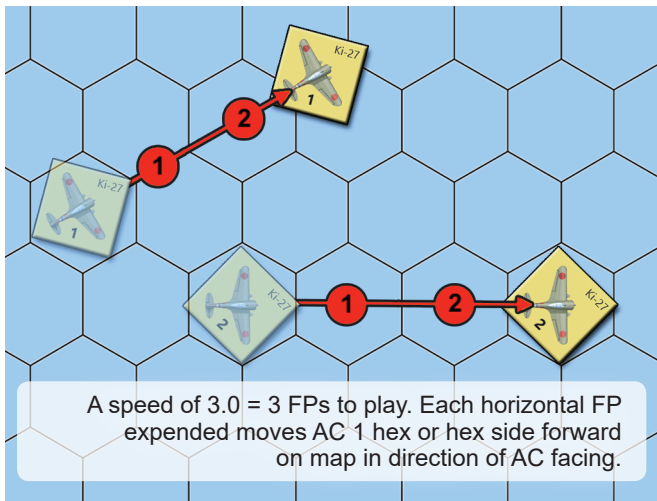
3.1 AC Movement and Types of Flight Points The game map has a numbered hex grid printed on it, which is used to track AC positions and regulate movement. During movement an AC must expend all of its available FULL FPs. There are two types of FPs: HORIZONTAL FPs (HFPs) and VERTICAL FPs (VFPs). How many of each type an AC may use depends on its declared nose pitch (flight path) attitude for the game turn, which may be level, climbing or diving. Each HFP expended advances the AC one hex (or hex side) across the map, but does not change its altitude. Each VFP expended changes the AC’s altitude by exactly 300 feet upward if the nose pitch is climbing, or 300 feet downward if diving, but does not advance the AC across the map.

3.2 Map Hexgrid and AC Facings During movement AC counters must always be pointed at (face toward) one of the six hex sides of the hex they are in, or at one of the six hex-junctures between two hex sides. This means there are 12 distinct AC facings that are usable in play, which are labeled with compass headings as depicted in the diagram below, with north being to the top of the game map, and east toward the right side of the map.



In TW, AC are not restricted to just moving just from hex to hex, but can also be advanced forward onto specific hex sides of a hex during movement, but ONLY IF the AC’s facing is parallel to the hex side and the hex side is directly in front of the AC’s nose. So, depending on their facing, an AC might be moving from hex center to hex center, or from a hex center onto a hex side and then to the next hex center as it advances across the map.

The next diagram below depicts an AC with a start speed of 3.0 expending its three allotted FPs as HFPs in level flight to advance three hexes straight ahead across the game map. Note how the AC advancing in a NE direction lands on a hex side after expending its first and third FPs.



4.0 HOW TO FLY

Flying AC each game turn is simple. With the aircraft data card (ADC), the play aid charts and your AC log sheet in hand, you have everything you need to maneuver an AC on the game map. The AC log sheet provides the AC's current location, map facing, altitude, speed, wing angle of bank, carried energy state and nose pitch for the start of an AC's move. You only have to decide what changes to make to these status items as you go, per the flight procedure given below:

AC FLIGHT PROCEDURE

- 1. Choose Power:** Select engine power setting (idle power or normal) – If idle, immediately reduce start speed by 0.5. Take accel.
- 2. Determine FPs Available to Play:** Allot FPs to AC = start speed. If start speed includes a half FP, add it to any previously carried half FP to gain another full FP for the current move. If a previous half FP is not available, carry this half FP to the next turn.
- 3. Declare Pitch Angle** Select a new pitch angle as allowed or keep current pitch angle. Determine flight path angle if pitch change was two steps, rather than one step. Choose the amount of HFP and VFP you will use as allowed by the AC's flight path.
- 4. Expend All Full HFPs and VFPs in Movement:** Expend FPs in any order desired to accomplish move. Each HFP advances the AC across the map by one hex or hex side, and each VFP changes altitude by 300 feet. Full FPs may not be left unexpended.
- 5. Maneuver AC During Movement:** As you expend FPs of either type, they count as passage of time indicators for time-based actions such as banking your wings, prepping for slips or skids and changing facing to the left or right (doing horizontal turning).
- 6. Adjust Final Altitude:** At end of AC's move, an optional altitude adjustment of 100 or 200 feet is allowed. This adjustment must be upwards if end pitch of AC is a climb, and downwards if end pitch is a dive, and either up or down if end pitch is level flight.
- 7. Calculate AC Speed Change:** Sum acceleration points (accel) gained from engine power and by diving (alt. loss). Sum deceleration points (decel) incurred through maneuvering and climbing. Determine your energy state change by subtracting total decel from total accel. Each +5 of energy change left over increases speed by 0.5, and each -5 of energy change left over decreases speed by 0.5. Positive or negative energy change nos. of 4 or less are carried forward to the next game turn.
- 8. Update AC Log Sheet:** Fill in your new end of move data in the upper section of the next game turn's column of the log sheet. Specifically, your new altitude, start speed, wing bank, energy change carry and pitch angle.

4.1 Aircraft Data Cards (ADC) Being comfortable reading an ADC is the key to success in learning to play. There are a lot of numbers and charts on each ADC. Please note that you only need to use a few at a time each game turn. The following rules identify when and how to reference and use ADC information. Please note that TW ADCs are formatted to be compatible with the more detailed **Fighting Wings (FW)** game rules and, thus, present more information than you need for TW play. This also means ADCs published for FW and TW games are interchangeable and compatible with either rules set. If you see something on an ADC not explained in TW rules, you can simply ignore it. For moving AC in play, the two most important parts of the ADC are the **AC Performance Chart** and the **Power versus Speed Chart**. Pay close attention to these. Let's begin with a general description of the ADC. Each is divided into six sections. Each section gives you information you may need at some point in play. Refer to the full size P-40B/C ADC and the annotated ADC example below and follow along for a brief description of each ADC section and what you typically need from it:

- A. General Data** Identifies AC type, gives engine info, max speed and ceilings, available weapon stations and their load capacity (which TW abstracts more). For the QS version of TW, you need only the AC's max ceiling, defense factor, damage capacity factors and the AC protection die roll modifiers for "critical" hits against cockpit, fuel and engine areas.
- B. Three-view Drawing** Depicts AC appearance, service entry date and agility class (F = fighter), plus the victory point (VP) values given to the other side for damaging the AC to severe damage level, or destroying it.
- C. AC Performance Chart** This data is what is most often used in play. Each game turn you will want to know minimum and maximum allowed speeds, the minimum speeds required and the decel incurred for using a defined turn rate. One line of speed limits and minimum turn rate speeds is given for each band of altitude defined in the game. Use only the line for the altitude band an AC is in at the start of a game turn and ignore the other lines. The average climb info is not used in TW. All speed information is given in terms of FPs.
- D. Power vs. Speed Chart** One line of engine data is given for each altitude band. Cross-index the AC's start altitude band with the speed range column containing the AC's start speed to find available engine accel for the game turn. Under the power nos. area is a "Banking FPs" line and a "Side Slip FPs" line. These define times needed, in terms of FPs expended, to change bank angle or to prepare for a slip or skid displacement. These nos., unlike engine accel power, do not change with altitude. See rules 6.0 and 7.0 below.
- E. Notes & Variants** Unique information about an AC is found here. Some notes may affect game play. Please read before play.
- F. Fire Power Chart** The armament carried by an AC is divided into gun groups. "N" guns are nose mounted. "W" guns are wing mounted (L= left wing guns, R= right wing guns). Each gun group is given a firepower rating, in terms of attack factors, which changes with the range to the target (See combat rules below). These are used to determine combat odds.

4.2 Changing AC Speed An AC's actions each turn increase or decrease its speed (energy). To calculate the AC's speed change from game turn to game turn, separately sum all acceleration (accel) points and deceleration (decel) points accumulated by an AC during its move. Subtract total decel from total accel. For each 5 points of accel remaining, increase AC speed by 0.5. For each 5 points of decel remaining, decrease AC speed by 0.5. If, after making all speed changes, there is any remaining accel or decel of 4 or less points, those are carried over into the next game turn, to be included in that turn's energy accounting. (*Example: 18 accel points earned – 11 decel points incurred = +7 accel remaining = +0.5 speed increase with 2 accel carried forward*).

4.3 Engine Power Accel And Diving Accel AC gain accel from their engines and by diving. There are two throttle settings, normal and idle. If you choose normal – you may claim accel points in any amount, from 0 to the largest no. found to the right any slash in the Power versus Speed section of the ADC. If you choose idle power, immediately reduce the AC's start speed by 0.5. For every 100 feet of altitude an AC descends (for any reason), it earns 1 accel point.

4.4 Maneuvering Decel and Climbing Decel During flight AC may change pitch angle, start horizontal turns, or initiate a slip maneuver. These acts cost energy. The amount of decel incurred for initiating a horizontal turn is based on the turn rate selected (see 6.2 below). Changing pitch angle by one step incurs TT rate decel, and changing pitch by two steps incurs twice the HT rate decel. Initiating a slip preparation move incurs HT rate decel. For every 100 feet of altitude an AC ascends, it incurs 1 decel point.

4.5 Exceeding Max Level Speed and Overspeed Decel If an AC's new start speed for a game turn is above its maximum allowed level speed for its altitude, two things happen: 1) The maximum engine power accel that can be taken is 0 points, and, 2) The AC incurs "OVERSPEED DECEL", calculated as follows – Subtract its maximum allowed level speed from its current start speed and multiply the difference by 2. Overspeed decel is added to the total decel incurred during a move. Note - AC must START or END the current game turn in a dive pitch to accelerate past their max adjusted level speed, or to accelerate further if already above max level speed. If NOT starting or ending the game turn in a dive pitch, and if starting at or under max level speed, any net accel points that would raise increase an AC's speed, or be carried to the next turn once max level speed is reached, are forfeit.

4.6 Exceeding Max Dive Speed If after opting for idle, or normal power, an AC's start speed exceeds its max allowed dive speed, roll a D10. Add 1 to the roll per Wing Spar or Tail Structure critical hit existing on the AC. If result is ≥ 9 , the AC is destroyed.

4.7 AC Min Level Speed and Stalls If an AC's start speed is less than its minimum allowed speed for its altitude, the AC is stalled (loses all wing lift) and must execute the **STALLED FLIGHT PROCEDURE** which is as follows:

- 1. Choose Power:** Per the normal flight procedure above.
- 2. Do a Stalled Pitch Change:** Immediately change AC pitch by 2 steps downward (at no decel cost) from its start pitch toward a steep dive. Once it reaches a steep dive, it stays there. The new "stalled pitch angle" is also the flight path angle" the AC will use. The AC must take the max allowed diving VFPs for that pitch (this is zero if stalled flight path = level). It must take 200 feet of diving optional change. If the stalled AC's start speed is less than 1.0, then one full FP is allotted to it to use. Wing bank instantly becomes level. Stalled AC may not use their FPs to do any turns, maneuvers. Stalled AC may not make attacks.
- 3. Update Log Sheet:** Accel from engine power and diving are gained normally. No decel is incurred, except any carried accel or decel is applied normally. If the AC's end speed is $\geq$ its minimum allowed speed, it returns to normal flight with the stalled pitch angle as its new start pitch angle for the next turn. If not, it remains stalled and must do another stall procedure next game turn.

5.0 AC PITCH ANGLES AND ALLOWED FPs

In QS, there are FIVE nose pitch angles defined in play, these are: Level Flight (LVL), Normal Climb (CL), Normal Dive (DV), Steep Climb (STC) and Steep Dive (STD). Each pitch angle has a defined limit, in terms of an allowed ratio of HFPs to VFPs that may be opted for and spent in a game turn as given below:

- Level Flight (LVL):** All available full FPs MUST be spent as HFPs.
- Normal Climb (CL) or Normal Dive (DV):** Half (rounded up) or more of all the AC's full FPs must be HFPs and from one, to all the remaining FPs may be climbing or diving VFPs, respectively. If an AC has only 1 FP to play, it must be an HFP.
- Steep Climb (STC) or Steep Dive (STD):** At least half (rounded up) of all of the AC's full FPs must be VFPs and from one, to all the remaining FPs may be HFPs. If an AC has only one FP to play, it must be a VFP. Exception – If the previous game turn's pitch attitude was also a climb, then up to ALL FPs may be VFPs.

5.1 Changing Pitch Angle At the start of each AC's move, a player may elect to keep the same pitch as used the previous turn or to change the AC's pitch by one or two angles (steps). As long as an AC is not in a stall, it may always change pitch from its current pitch angle up or down to an adjacent pitch angle (a "One-step" change) before moving (*e.g., a normal climb is adjacent to level flight and steep climb pitch*). If the AC has sufficient speed to use HT or greater turn rates it may change pitch by two angles (*e.g., from normal dive to normal climb, or from level flight to steep climb, termed a "Two-step" pitch change*).

- A One-Step pitch change incurs decel as if doing a single horizontal facing change at the TT rate.
- A Two-Step Pitch change incurs decel as if doing TWO horizontal facing changes at the HT rate.

5.2 AC Flight Paths If an AC does not change pitch, it must choose HFP and VFP amounts as allowed per its current pitch angle. If it does a One-Step change, it chooses FPs as allowed for the newly selected pitch angle. If the AC does a Two-Step pitch change, it chooses FPs as allowed for the intermediate pitch angle, the one between the starting and ending pitch angles (to model an average flight path). For all other purposes (*e.g., combat and aiming*) an AC's pitch angle is that of its ending pitch angle.

5.3 Game Altitude Structure Expending VFPs causes AC to change altitudes. AC performance varies with altitude since the air gets thinner as height increases. Note that the AC Performance Chart and the Power versus Speed Chart on an AC's ADC presents data dependent on which "Altitude Band" the AC starts a game turn in. In TW, the sky is divided into eight different coded height bands (see below). Within each band there are six 1,000 foot "levels" and within each level there are nine 100-foot "increments". Altitude is recorded on the AC log sheet as follows: "Thousands dot hundreds" (*i.e., "2.1" = 2,100 feet, or two levels and one increment*). Any AC descending to an altitude of 0.0 or below immediately crashes into earth and is removed from play.

• UH+ (Ultra-high band)	43,000 feet and higher
• EH (Extremely high band)	37,000 to 42,900 feet
• VH (Very high band)	31,000 to 36,900 feet
• HI (High band)	25,000 to 30,900 feet
• MH (Medium high band)	19,000 to 24,900 feet
• ML (Medium low band)	13,000 to 18,900 feet
• LO (Low band)	7,000 to 12,900 feet
• VL (Very low band)	Surface to 6,900 feet

6.0 AC ANGLE OF BANK

An AC's wings must be banked (tilted) in order for it to do turning. In TW, there are three angles of bank: Level (LV), Right Bank (RB) and Left Bank (LB). An AC may not turn right until after it establishes itself in a RB and it may not turn left until after it establishes itself in a LB. If in a level bank, it may not do turning at all. Changing bank angle is accomplished by rolling the wings. From a level

bank, the AC can roll left once to reach LB, or right once to reach RB. If starting in a LB or RB, in order to reverse its banking direction, it must first roll back to a level bank and then roll again to reach the opposite bank angle. Banking (rolling) does not cost FPs to perform, but it takes time, measured in terms of FPs expended while flying. The time required is indicated in the *Banking FPs* line of the Power versus Speed Chart of the ADC. Find the banking FPs number under the speed column that corresponds to the AC's start speed. After the AC expends that many FPs (HFP or VFP) in movement, the new bank angle is established and the AC can initiate turning at any subsequent point in its move. AC are not required to do turning if banked. There is no penalty for remaining banked indefinitely. Once started, a roll to a new bank angle may not be interrupted, abandoned or extended. Rolling can be started in one game turn and finished in the next.

6.1 Horizontal Turning A pilot makes an AC turn by establishing an angle of bank and then pulling back on the controls to increase the lift the wings generate. The lateral component of this extra lift causes the AC's flight path to curve. The centrifugal acceleration felt by the pilot while turning is measured in "G" rates (G = a force of gravity). The harder the pull, the higher the G rate and the tighter the AC's turn radius will be for any given speed. As the lift generated by wings is a function of their angle-of-attack and the speed of the air flowing over them, an AC must be traveling fast enough for its wing to generate enough lift for a G rate without exceeding the wing's critical stall angle. In essence, higher G rates require more speed. In TW, we don't model critical wing angle stalls (maneuvering stalls), as the pilot is presumed to know to avoid them. Rather – AC are restricted to only using Turn Rates allowed by the AC's start speed. Important note – the greater the turn rate used, the greater the drag induced on an AC.

6.2 Turn Rate & Minimum Required Speeds To do a horizontal turn choose an available turn rate allowed by the AC's speed. Refer to the *AC Turn Rate Chart* on the *Flight Play Aid* card and cross-index the AC's speed with the selected turn rate to find the Turning FP requirement (see below). There are five Turn Rates a player may choose from, each representing increased G-forces. They are: EZ (Easy turn), TT (Tactical turn), HT (Hard turn), BT (Breaking turn) and ET (Emergency turn). EZ turn rates can be used any time the AC is not stalled. In order to use TT to ET rates, the AC must have a start speed equal to or greater than the selected turn rate's minimum required speed. The Minimum required speed is found on each ADC's *Aircraft Performance Chart* by cross-indexing the altitude band the AC started the game turn in with the selected Turn Rate column. If an AC's start speed is less than needed for a desired rate, or a dash is in that spot, a lesser rate must be used. The decel amount incurred for starting a turn at a given rate is also found in the *AC Performance Chart*, at the top, in parenthesis, next to the two-letter turn rate code (TT to ET) of the Turn Rate column. EZ rates always costs half the TT rate (as per the *Fractional Values Table* of the *Flight Play Aid*).

6.3 Aircraft Turn Chart Entries There are three types of Turn FP Requirement entries found on the *AC Turn Chart* of the *QS Play Aid card*, which are: double digit (in degrees), single digit or two digits separated by a dash (split-rate).

- **Double Digit "60" or "90" Entry:** This indicates that from 30° to that many degrees of facing may be taken with each FP expended in movement. Each 30° taken is counted as a separate horizontal turn, so even though the double digit turning is initiated only once, decel is incurred per 30° of facing opted for after the turning FP is expended.
- **Single Digit Entry:** This indicates how many FPs, at a minimum, must be spent before the AC can change facing by 30°.
- **Two Digits split by a hyphen Entry:** This indicates a split turn rate. The first 30° facing change requires the amount of FPs indicated before the dash, and the second 30° facing change requires the FPs indicated after the dash. This sequence then repeats, and may continue so long as the turning is uninterrupted and the AC's speed doesn't change. If there is an interruption of the sequence for any reason, the sequence must be started again using the FPs indicated before the dash.

6.4 How & When Facing Changes Occur Once initiated, a horizontal turn must be completed without interruption or abandoned. AC may do multiple horizontal turns in a move. For a 60° or 90° Turn FP requirement, and for single digit entries whose value is 1, an AC's facing may be changed by up to the amount indicated (30° if entry is 1) immediately after the AC expends at least one FP in flight. For single digit entries whose value is 2 or more, and for double-digit entries, as soon as FPs have been expended in flight equal to or greater than the Turn FP requirement for a facing change, the AC's facing may be changed 30°. The act of changing facing does not cost any FPs. Turn Rate decel and the time spent expending FPs in flight are the only costs of turning. *Important – Facing changes are always made in the direction of the AC's angle of bank (e.g., to the left if in an LB bank).*

6.4.1 Facing Changes from a Hex Side If an AC is on a hex side at the moment it executes a facing change, first shift it to the adjacent hex on the side toward which it is turning and then adjust its facing.

6.5 Extending Turns A horizontal turn initiated at any Turn Rate may be extended (widened), simply by expending more FPs than the minimum amount required before changing AC facing. Extending a turn is not an interruption of the turn. A horizontal turn is not considered an extended turn until the it expends more FPs than needed for its Turning FP requirement.

6.6 Carrying Turns Forward If a horizontal turn is initiated with insufficient FPs remaining in the current game turn to complete it, or if a player extends turning such that it is unfinished by the end of the AC's move, all turning progress completed is carried (credited) into the next game turn. This progress is noted in the *Turn Carry* block of the AC log sheet for the next game turn and the carried turning is added to any continued turning in the next game turn to complete the original horizontal turn initiated. *Turn Carry* is logged in an "FPs-Rate-Direction" format (i.e., "2HTR" means 2 FPs carried at the HT rate for a Right facing). Completing a carried turn does not incur new Turn Rate decel, as the AC already incurred that on the game turn the horizontal turn was initiated. AC may carry an unextended turn forward for as many game turns as needed to meet the original Turning FP requirement. AC may not carry an extended turn forward more than once. Such must be completed, or abandoned by the end of the game turn of carry.

6.6.1 Turn Carry and Split-Turn Rates When a split-rate turn's first or second FP requirement is carried forward, the split-rate sequence can only be continued if the current game turn's requirement is for the exact same split-rate sequence values that were carried forward. AC having normal *Turn Carry* available at the start of a game turn, whose new start speed would utilize a split rate for the carried turn rate, must first complete, or abandon, the carried turn before the newly available split rate can be initiated.

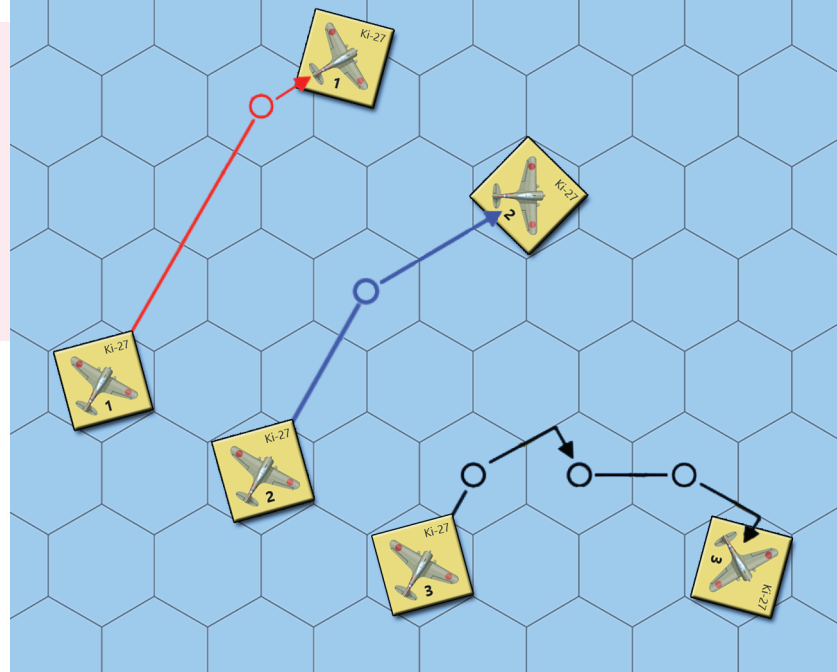
6.7 Abandoning Turns Players may abandon a horizontal turn at any point after the first FP of turning is expended, but the decel incurred for initiating the turn is kept and only one horizontal turn may be abandoned per game turn. Any turning progress of an abandoned turn is immediately lost.

6.8 ET Rate Turning Limits and AC Overstress AC that use ET rates may not fire guns in the same game turn and must roll a D10 at the end of the movement phase to check for overstress. If ≤ 1 rolled, a wing spar critical hit is incurred (–1 to roll per existing wing spar hit or facing change > 1 done in same game turn at the overstress rate). AC with Wing Spar damage, which use ET rates are destroyed (the wing breaks off), and if they use BT rates, they must check for overstress as if doing ET rates.

Horizontal Turning Examples

AC at speed 4.0, in level flight pitch with 4 HFPs to play, turning to the right.

- 1. Red Path:** TT rate turn to right. Turn Req.= 3 for 1 facing.
- 2. Blue Path:** HT rate turn to right. Turn Req.= 2 per facing.
- 3. Black Path:** BT rate turn to right. Turn Req.= 1 FP per facing.
(Note how #3 AC displaces off of a hex side into adjacent hex when executing facing changes)

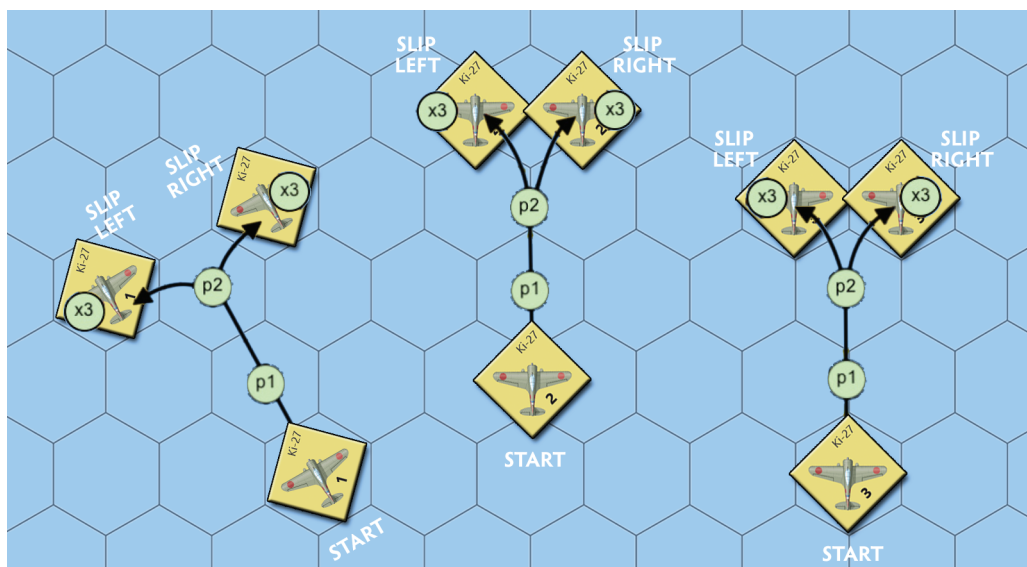


6.9 Move-to-Act Rule When an AC's speed changes between game turns, use the new start speed's FP requirements for finishing a carried turn or maneuver. If the carried turn rate is not legal for the new speed, the turn rate and FP requirements immediately convert to the next lower legal rate. An AC can never start a game turn with a facing change, or execute a slip maneuver before expending FPs. If the carried FPs already meet a new turn or maneuver FP requirement, the AC must still expend at least one FP in flight prior to turning, or executing a maneuver. This is termed the "move-to-Act" rule.

7.0 SIDE SLIP MANEUVERS

Side slip maneuvers allow AC to immediately displace forward and to either side of their movement path while keeping their current facing. A side slip may be done in either direction (left or right) regardless of current wing angle of bank. Performing a side slip is a two-step process: First, a preparation time (prep-move), prior to executing a side slip, in contiguous FPs of flight (HFPs or VFPs allowed), must be met. This prep time is listed on each ADC for each speed range of the *Power vs. Speed Chart* as "Side Slip FPs." Once the prep time is met or exceeded in FPs of contiguous movement, over one or more game turns, the AC may be displaced as shown at right by expending another HFP (VFPs cannot be used to execute slips).

7.0.1 Side Slip Limits Side slip prep-time and execution FPs may not be used for rolling or turning. Starting a side slip immediately incurs decel = HT turn rate decel, whether the maneuver is completed or abandoned later. There is a shot percentile roll modifier for being in, or having done a side slip during the game turn of +15. Side slip prep FPs may be carried forward into the next game turn. Above is a diagram of an AC with a side slip prep-FP requirement of 2, expending 3 HFPs to perform a slip.



Side Slip Examples

(Note that AC facing does not change during maneuver.)

Sample AC have Side Slip Prep-move FP requirements of 2. After spending 2 HFPs to prep, they expend a third HFP to execute slip displacement from p2 to x3 position.

8.0 AC LOG SHEET USE

Each AC in play requires a log sheet to track its speed, height and energy status. The layout of the log sheet should be self-evident. Each game turn an AC's decisions are recorded in that game turn's column in a vertical fashion. As the aircraft is maneuvered, note any acceleration points gained from engine power and diving. Sum these accel points together. Underneath these are spaces for recording decel points incurred by climbing, turning, changing pitch and doing various maneuvers (Misc. decel). Sum all the decel points incurred and subtract them from the total accel points to determine changes in the AC's speed per rule 4.2. There are also spaces for recording any maneuver carry from the previous turn, the HFP / VFP split used in the current turn and altitude changes made. At the end of an AC's move, fill in the new start data for the next turn. Note that the log sheet provides spaces for activities and actions not used in the *Tiger Wings* Rules set, so simply ignore these.

QUICK START (QS) AIR COMBAT RULES

9.0 AIR TO AIR COMBAT AND FIELDS OF FIRE

A target must be in both the firer's horizontal and vertical fields-of-fire and within range of the firer's guns to be attacked. The horizontal field-of-fire is shown in the Horizontal Fields-of-Fires (FoF) Diagram for AC facing hexes, hex junctures and on hex sides, for when not turning, and when turning left or right. Targets in the same position as the shooter and in half shaded hexes in the arc diagrams are valid targets. The turning horizontal arc applies if the AC's last FP expenditure prior to shooting involved a facing change or turning. AC on non-shaded hex sides of a half-shaded hex are not valid targets. The vertical field-of-fire is defined in terms of allowed altitude differences between shooter and target as follows:

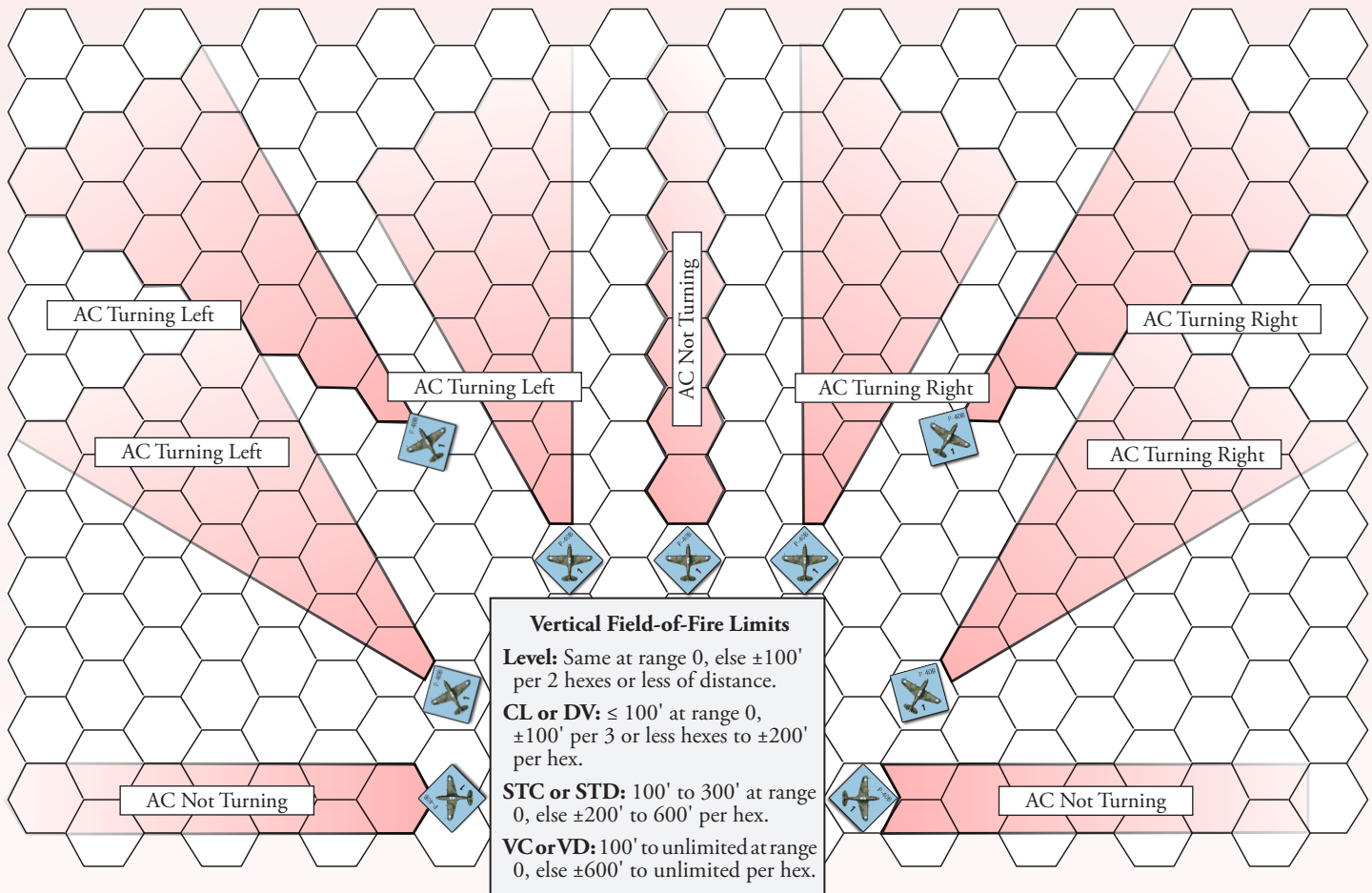
9.0.1 Firer's Pitch is Level Flight Target cannot be over 100 feet higher or lower than shooter per two hexes of horizontal range or less. Target must be at the same altitude for a same hex (or same hex side) range = zero attack.

9.0.2 Firer's Pitch is a Normal Climb or Normal Dive If target is not in the same hex (or on same hexside), it must be at least 100 feet higher if shooter climbing, or lower if shooter diving, per 3 hexes or less of horizontal range, and not more than 200 feet higher or lower (respectively) per horizontal hex of range. If target is in same hex (or on same hex side), it must be at either the same altitude or not more than 100 feet higher than shooter if shooter climbing or 100 feet lower if shooter diving.

9.0.3 Firer's Pitch is Steep Climb or Steep Dive If target is not in the same hex, it must be at least 200 feet higher if shooter climbing or lower if shooter diving, and not more than 600 feet higher or lower (resp.), per horizontal hex of range. If the target is in the same hex (or on same hex side), it must be between 100 to 300 feet (inclusive) higher or lower (resp.). **Exception:** If an AC used all FPs as VFPs (a vertical climb or vertical dive), the target must be at least 100 feet higher or lower, respectively, if in the same hex, and not less than 600 feet higher or lower, respectively, per horizontal hex of range, up to an unlimited difference in height.

TW FIXED FORWARD FIRING GUNFIRE ARCS DIAGRAM (QS 9.0)

Illustrated below are the horizontal fields-of-fire for AC not turning and for AC turning (i.e., with turn carry in progress or having just faced due to a turn, skidding turn, vertical roll or any reversal maneuver done with banked wings). Examples are shown for AC facing a hex side, a hex juncture and for AC located on a hex side. Any target located in a shaded area or on a line that is a border of a shaded area may be fired upon.



9.1 Stacked AC or Same AC Positions, Who Is In Front?

AC in the same hex, or on the same hex-side, at the same exact altitude are “stacked”. If not at the same altitude, they are just in the same position. The AC that last enters the same position as another AC is considered to be behind the former for purposes of combat (unless both are facing each other's front arcs while in level pitch or facing each other's front arcs while one is climbing and other diving, then each is still in front of the other).

9.1.1 Collisions AC ending a game turn stacked with one another may collide fatally. Roll a D10, if result = 10, both are destroyed.

9.2 Same Position Horizontal Field of Fire Check To find if an AC can fire at another when in the same position, at range zero or further, shift the AC which LAST entered the position during the game turn backwards one hex or hex side using its final end-of-move facing. If, from this position, an AC still has the target in its horizontal field-of-fire, it may attack. Immediately return shifted AC to its “same position” location before resuming play.

9.3 Shot Range To determine the attack range (approximating Pythagorean distance), first determine the shortest horizontal range in counted hexes to the target. Next, determine the vertical range in altitude difference to the target, with each full 300 feet of difference counting as 1 hex of range, while rounding any leftover 200 feet beyond range 1 up, and any leftover 100 feet beyond range 1 down. If the total altitude difference is less than range 1 (i.e., 200 feet or less), then vertical range is zero. Treat a target on a hex side as being in the hex on either side of that hex side which is closest to the shooter. Sum the larger of the Horizontal range or Vertical range with half the lesser of the two ranges (rounded down) to determine total range (more succinctly, us longer range + ½ shorter range (rounded down) = shot range). **Example:** A shooter 4 hexes away and 800 to 1,000 feet higher has a hor. range 4 and a vertical range of 3. Total range would be 4 (larger distance) +1 (half the smaller distance (of 3) rounded down) = 5.

9.4 Gun Ranges & Firepower The Firepower Chart on the ADC lists the attack strength of each group of guns an AC has. All or some of the gun groups may be used in an attack. When determining the odds of an attack, sum the firepower value for the appropriate total range of all the gun groups being used.

9.5 Resolving Gun Attacks Follow the *Deflection Aid Chart* Instructions to calculate the final deflection angle between the target and the shooter, which accounts for both heading and pitch differences. Multiply the target's defense value by the final deflection modifier and compare that to the firepower used to get a combat odds. Round fractions down to the next whole odds (1.4 to 1 odds becomes 1-1 odds). If an odds amount is not available (e.g., 1-3 odds does not have a column), use the next lower odds of 1-4. Roll percentile dice (01 to 100 using two 10-sided dice (two tens = 100, else a 10 for the first roll = zero)).

9.5.1 Shot Percentile Roll Modifiers Apply appropriate shot modifiers for shooter AC damage, end speed and highest turn rate used. Only apply the turn rate modifier (once) for the single highest turn rate used in, or carried into, the current game turn by the shooter (whether for turning or for changing pitch two steps (HT rate)). Cross index the modified percentile result with the combat odds to find the number of hits inflicted. A dash result indicates a miss.

9.5.2 No Deflection Modifiers An imaginary line projected from an AC's nose in the direction of its flight is called the 12:00 o'clock line. An imaginary line projected from an AC's tail in the opposite direction is called the 6:00 line. Whenever a shooter's 12:00 line superimposes a target's 6:00 line, whether the shooter is in front or behind the target, little to no deflection has to be compensated for by the shooter. If so, apply the die roll modifiers listed in the *Combat Chart*. **Exception:** This is NA if pitch angle difference between shooter and target is greater than one pitch angle. (e.g., a shooter in a steep dive firing down at a target in level flight does not qualify).

Combat Odds Example: A P-40B is firing at an Oscar. The range is three. All guns are being fired. Total firepower = 16. The deflection is 30°, which is a x 2 multiplier to Oscar's defense factor of 5. Final defense factor is 10. Odds are: 16 to 10, which = a 1-1 odds attack.

9.6 AC Damage AC have two damage factors listed on their ADCs in the 3-view section. When cumulative hits exceed the lower factor (left side), the AC is severely damaged. When they exceed the higher (right side) factor, the AC is destroyed (shot down).

9.6.1 Severe Damage Effects Severe damage impacts an AC's flight ability as follows:

- Add 0.5 to all min. level and all min. turn rate speeds.
- Reduce all listed max. level and dive speeds by 1.0.
- Add 1 to all bank FP and side slip FP requirements.
- ET turns destroy an AC, BT rates risk overstress as if ET.
- Add +2 to any exceeding max dive speed D10 rolls.
- Add +15 modifier to shots taken by damaged AC.
- Add 2 decel points per game turn (torn metal in slipstream).

9.7 Aircraft Critical Hit Damage Compare the total number of hits inflicted in a single attack on the target with the lowest “Criticals” rating of any of the gun groups used by the shooter. For each number of hits scored exactly equal to that critical hit rating, one Critical hit is allotted against the target and must be resolved. For each critical hit, roll a D10 to determine the area affected by the critical hit and then roll another D10 roll on that area's *Critical Hit Effects Table* to determine the results. Immediately apply the results for each critical hit on the target before resolving any following critical hits from the same shot. **Example:** A P-40B/C's .50 caliber guns have a critical rating of 3, which is lower than the wing gun's 4 rating. Thus, for each 3 hits on an enemy AC, one critical hit is inflicted.

9.7.1 AC Protection Critical Hit Effect Mods. Some AC have cockpit, fuel tank, or engine protection modifiers listed on their ADC due to armor or self-sealing tanks. Add these modifiers to any critical hit effect die rolls in those AC areas.

10.0 VICTORY

QS scenario winners are determined by earned Victory Points (VPs). Each AC has two VP numbers shown in its ADC. The lower number is awarded to the enemy side if that AC is only severely damaged by the end of play. The higher number is awarded if the AC is shot down by the end of play. In addition, one extra VP is awarded for each critical hit achieved on an enemy AC regardless of end of play damage state, except total VPs for any single AC may never exceed its shot-down value.

QUICK START (QS) SCENARIOS

Scenario #1 – HEAD ON FIGHT

Set up the P-40B in hex 3020, facing E, wings level in level flight at altitude 15.0 and speed 6.5. Set up the Oscar-Ib in hex 3035, facing W, wings level in level flight at altitude 15.0 and speed 6.0.

Scenario #2 – PASSING ABEAM FIGHT

Set up the P-40B in hex 2625, facing E, wings banked left in level flight at altitude 15.0 and speed 6.5. Set up the Oscar-Ib in hex 3435, facing W, wings banked left, in level flight at altitude 15.0 and speed 6.0.

Scenario #3 – SAME WAY ABEAM FIGHT

Set up the P-40B in hex 2620, facing E, wings banked left in level flight at altitude 15.0 and speed 5.0. Set up the Oscar-Ib in hex 3420, facing E, wings banked right in level flight at altitude 15.0 and speed 5.0.

Scenario #4 – JUMPED FROM ABOVE FIGHT

Roll D10 per AC (roll again as needed to break ties). Set up low rolling AC in hex 3020, facing E, wings level in level flight at altitude 15.0 and speed 5.0. Set up high rolling AC in hex 3015, facing E, wings level in a steep dive at altitude 18.0 and speed 7.0.

Tiger Wings / Buffalo Wings AC Log Sheet

Aircraft:	Pilot Quality: Initiative Mod:															
Game Turn	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Damage Notes:
Initiative Roll																
Hex																
Facing																
Altitude																
Speed																
Half FP carry	No															
Bank Angle																
Nose Pitch																
Turn / Mvr. carry	None															
Pitch Δ Steps																
New Pitch																
HFPs to Play																
VFPs to Play																
Alt. Δ By VFP																
Alt. Adjustment																
Total Alt. Change																Combat Notes:
Accel Carry	0.0															
Eng. Pwr. Accel																
DV Att. Accel																
Diving Accel																
Total Accel																
Decel Carry	0.0															
Pitch Δ Decel																
CL Att. Decel																
Climbing Decel																
Turning Decel																
Maneuver Dec.																
Over Spd. Dec.																
Total Decel																
Accel – Decel =																
Spd. Change =																