

Simple Fighting Wings 2.0

1. Scope and Intent. Simple Fighting Wings takes Fighting Wings 2.0 (an excellent game in its own right) and attempts to create a faster-playing game using the same general game system. It attempts this in 2 ways. First (and most obviously), it tries to simplify the rules of Fighting Wings to create less “load” for the players. It smoothes details, eliminates special cases and narrows the focus of the original game. Second, it uses an Excel spreadsheet as the aircraft log sheets for the game. The log sheet takes some of the burden of data entry and calculation from the players, automatically implements some aspects of the game that the players would otherwise have to remember or look up, and provides handy prompts for other rules. Simple Fighting Wings focusses on shooting things down. It does not provide rules for attacks on ground and naval targets. It concentrates on combat, and does not include tactical or operational scale modules. Simple Fighting Wings is not affiliated or endorsed in any way by Fighting Wings, its publishers or its designer.
2. Scale. A hex is 900 feet across. Altitude is measured in 100 foot increments. A game turn represents 12 seconds of time. A speed point is 50 miles per hour and an accel or decel point is a change in speed of 12.5 miles per hour. As with Fighting Wings, 0.5 accel and decel points are tracked.
3. Log Sheets. Excel-based log sheets are used to track aircraft position and to record and calculate aircraft acceleration and deceleration. The log sheets also track aircraft damage and weapons. In addition, they have a tool used to calculate distances.
 - a. The log sheets are Excel 2010 spreadsheets. Each numbered column on the log sheet represents 1 turn. Grayed cells in the log sheets indicate cells that are calculated by formulas in the spreadsheet. Un-grayed cells indicate information to be entered by the player.
 - b. A number of the cells in the first column of the log sheet have associated comments that provide guidance on the numbers to be entered. Hovering the mouse pointer over the relevant cell shows the comment.
 - c. Increases in altitude are entered as positive numbers. Decreases in altitude (including downward VFPs) are entered as negative numbers, preceded by a minus side.
 - d. None of the cells in the log sheet are protected. Whether by design or inadvertently, a player may overwrite the formula for a cell by entering a number in the cell.
 - e. For use, copy or rename the log sheet workbook. In the new workbook, label the tab at the foot of each sheet to indicate the aircraft for which it serves as a log. Each workbook has 8 sheets, each of which can be used for 1 aircraft. Players can create a single workbook for all aircraft in an engagement, or create 1 workbook for all the aircraft each side.
 - f. Players may wish to include other details about an aircraft in the tab identifying the aircraft: for example, “V” for a veteran, “A” for an ace, “FL” for a flight leader. Players may also find it helpful to change the format of a sheet to reflect the status of its corresponding aircraft: for example, italicizing the initiative row to indicate that the aircraft is damaged or greying out the row if the aircraft is shot down.

- g. Some of the rows of the spreadsheet are hidden. These merely show the calculations done by the spreadsheet, and do not have to be referred to by the player. They may be unhidden at any time by the players. In some cases, the hidden rows may appear as unhidden due to the foibles of file transfer protocols. Players may hide any rows that contain information not needed by the players.
 - h. Rows 71-76 of the log sheets contain the texts for the drop down menus in rows 8, 10, and 18. Players should take care not to delete these rows.
 - i. Be sure to preserve the original form of workbook so that it can be reused to create log sheets for additional engagements.
4. Aircraft Data Sheets. The simple game uses the same aircraft data sheets as the regular game. The following data is used from the game ADCs:
 - a. All minimum and maximum speeds,
 - b. Engine power data,
 - c. Whether an engine has “No F.I.”,
 - d. Ceilings.
 5. Additional Aircraft Data. Supplemental aircraft data sheets are used to provide the following information for each aircraft:
 - a. Defensive strength,
 - b. Weapons and firepower,
 - c. Decel costs and minimum speeds for turns, slips, skids, and transitions,
 - d. Rates of climb.
 - e. FPs for banking, slipping and skidding.
 6. Headings. Simple Fighting Wings uses degrees to express aircraft headings. Aircraft can be oriented to any of 6 headings: 30 degrees, 90 degrees (due east), 150 degrees, 210 degrees, 270 degrees (due west), and 330 degrees. As provided below, turns in Simple Fighting Wings are made in 60 degree increments. As a consequence, aircraft are never positioned on hexsides, always in hexes.
 7. Stacking and Collisions. Simple Fighting Wings has no collision rules. Stacking limits are 9 aircraft of the same side per hex in a fixed formation, or 6 aircraft of the same side in a flexible formation or no formation. As with Fighting Wings, “stacked” means in the same hex at the same altitude.
 8. Throttle Settings. Simple FW uses the same throttle settings as the regular game. However, selecting “Idle” results in a 1.0 FP speed loss, rather than 0.5 FP. The spreadsheet applies this speed loss automatically if the “Idle” throttle setting is selected.
 9. Flaps. Only combat flaps are used in the simple game. They have the following effects:
 - a. Their use can be declared at the start of a move.
 - b. They reduce all listed minimum speeds by 0.5.
 - c. They add 1 decel point per 60 degrees turned.
 - d. In addition, they add 1 decel point for the move in which they are used.
 10. Slats. Slats have the following effects in Simple Fighting Wings.
 - a. Their use is automatic.
 - b. They permit turns at HT rates or tighter at minimum speeds of 0.5 less than the aircraft’s listed minimum speed.
 - c. They add 1 decel point per 60 degrees turned when used.
 - d. Aircraft in or just having completed a turn using slats shifts all its weapon attacks ½ odds down.

- e. If an aircraft with slats is also using combat flaps, use the combat flap effects and ignore the slat effects.
11. Overspeed Speed Loss. Overspeed speed loss only applies if an aircraft's speed exceeds its maximum level speed and it does not lose altitude increments in its move at least equal to its starting speed. The decel points from overspeed equal the aircraft's current speed less its maximum level speed.
 12. Bank and Pitch Attitudes. The simple game uses the same banking attitudes as the regular game. It uses an 8 attitude system for pitch, with 2 of the attitudes – vertical climb and vertical dive – not allowed as attitudes in which an aircraft may begin or end a move. All bank and pitch positions are recorded on the flight log through the use of drop-down menus. The 6 allowed pitch attitudes are:
 - a. Level – “L” – the aircraft can elect to gain or lose up to 1 altitude increment per HFP.
 - b. Climbing – “C” – the aircraft must climb at least 1 VFP, and may take as climbing VFPs up to ½ of its total FPs for the turn.
 - c. Diving – “D” – the aircraft must dive at least 1 VFP, and may take as diving VFPs up to ½ of its total FPs for the turn.
 - d. Inverted level – “(I)” – the aircraft can elect to lose up to 3 altitude increments.
 - e. Inverted climbing – “(C)” – the aircraft must climb at least 1 VFP, and may take as climbing VFPs up to ½ of its total FPs for the turn.
 - f. Inverted diving – “(D)” – the aircraft must dive at least 1 VFP, and may take as diving VFPs up to ½ of its total FPs for the turn.
 - g. Fractional VFPs may rounded up or down by the owning player, but an aircraft can never move more FPs than indicated on its spreadsheet.
 - h. The spreadsheet automatically calculates the follow accel and decel points.
 - i. Aircraft beginning a move in an inverted attitude incur 3 decel points unless they lose altitude.
 - ii. Aircraft beginning a move in a C or (C) attitude incur 3 decel points.
 - iii. Aircraft beginning a move in a (C) attitude also incur an additional 1 decel point per upward VFPs in the turn, net of any downward VFPs.
 - iv. Aircraft beginning a move in a D or (D) attitude receive 1 accel point.
 - v. Note that a few aircraft in Fighting Wings have different climb decel and dive accel values that 3 and 1. Examples include P-47s and some Fw 190 models. If such an aircraft is being played, the player will have to alter the formula values in the log sheet to reflect the correct values. Alter the value for turn 1, then copy the altered formula into the columns for turns 2 through 20.
 13. VFPs. A VFP represents an increase or decrease of between 600 and 1200 feet of altitude. The owning player enters the number of VFPs to be moved by an aircraft, and the spreadsheet automatically calculates the number of 100 foot altitude increments gained or lost as a result at a rate of 900 feet per VFP. The player may then enter up to 3 100 foot increments of altitude change (up or down) for each VFP in the optional climb or dive section.
 - a. Moving aircraft have the following limits on expending VFPs:
 - i. VFPs in a move are equal to or less than HFPs – no more than 1 VFP per hex,

- ii. VFPs in a move are greater than HFPs but equal to or less than 2 times HFPs – no more than 2 VFPs per hex,
 - iii. VFPs in a move are greater than 2 times HFPs but equal to or less than 3 times HFPs – no more than 3 VFPs per hex,
 - iv. VFPs in a move are greater than 3 times HFPs – VFPs per hex unlimited
 - b. Players may wish to use blank counters to track the VFPs expended by an aircraft in each hex. This helps to track FP usage during an aircraft's move.
 - c. When an aircraft turns using at least 1 VFP, the FP requirement for the turn is reduced by 1.
14. Transitions. Simple FW uses a revised process for aircraft transitions through climbing and diving flight. See the transition table at the end of these rules for the details of this.
- a. Aircraft can transition up to 4 steps in a move. Minimum speeds for transitions are as follows:
 - i. 1 step – EZ turn minimum speed,
 - ii. 2 steps – TT turn minimum speed,
 - iii. 3 steps – HT turn minimum speed,
 - iv. 4 steps – BT turn minimum speed.
 - b. Transitions printed in red are negative-G transitions. An aircraft cannot use weapons in a turn in which it performs a negative-G transition.
 - c. An aircraft with a “No F.I.” engine must select “Idle” throttle for the turn after a turn in which it performs any “push” transition, unless the following exception applies:
 - i. The transition is a “push 1” transition, AND
 - ii. The aircraft banks into an inverted bank in the first FP of its move, AND
 - iii. The aircraft ends its move in an inverted bank.
 - d. Where the transition table specifies a fraction, the moving player has the option of rounding the fraction up or down. However, an aircraft can never move more FPs than indicated on its spreadsheet.
 - e. Note that some transitions result in climbing and diving VFPs in the same move. In this case, the player only enters the margin by which the climbing VFPs exceed the diving VFPs (or vice versa) on the log. The player must remember to account for all the VFPs in the aircraft's movement, and to move the aircraft fewer HFPs that the log would show.
 - f. As with Fighting Wings, players may apply a credit equal to half of the decel cost of a transition against decel costs of turning in the same move. The spreadsheet calculates this automatically.
15. Maneuvers.
- a. Turns. In simple Fighting Wings, aircraft turn in 60 degree increments. Turn FP movement requirement differ due to this and due to the larger scale of the simple game. See the turn chart at the end of these rules for the new FP move requirements. Decel costs are shown on an aircraft's supplemental ADC, and represent decel incurred for turning 60 degrees at the specified turn rate.
 - b. Turns using VFPs. When an aircraft turns using at least 1 VFP, the FP requirement for the turn is reduced by 1.
 - c. ET Turn Rates. Aircraft turning at the ET rate incur the following effects:
 - i. They may not use weapons.

- ii. They must roll D10. If a 1 is rolled, they must roll again with the following effects:
 - 1. On a 1, the aircraft is destroyed.
 - 2. On a 2 or 3, the aircraft is damaged.
 - 3. On a 4 or 5, the aircraft must move straight and level during the following turn. If the aircraft is in climbing or diving flight, it must return to level flight through the smallest transition.
 - d. Banking. FP requirements for banking are noted on an aircraft's supplemental ADC. A banking requirement of "½" means that the aircraft can change up to 2 bank attitudes in 1 FP.
 - e. Snap Rolls. Snap rolls cost 1 decel point and reduce FP requirements for banking by 1. An aircraft with a FP requirement of 1 reduces the requirement to ½ by snap rolling. An aircraft with an FP requirement of ½ cannot reduce it further by snap rolling.
 - f. Slips and Skids. FP requirements for slips and skids are shown on an aircraft's supplemental ADC. If an aircraft uses a skid to turn, it turns 60 degrees.
 - g. Wingovers. Aircraft may perform wingovers to decrease the space needed to turn. To perform a wingover, an aircraft must begin in an upright bank attitude and an L pitch attitude, with a speed of at least 4.0 or its minimum speed for a TT turn (whichever is greater). The effect of the wingover is that the aircraft moves 1 VFP up in first half of its move and 1 VFP down in second half of its move. It must end in the inverted bank attitude corresponding to its last turn. The aircraft incurs decel as shown on its supplemental ADC, in addition to any decel points for turning or other maneuvers. Note that the log sheet does not permit the entry of up and down VFPs in the same turn. Because the VFPs cancel each other out, the players simply make no entry in the VFP cell and move 2 HFPs less than indicated in the HFP cell.
 - h. Reversals. Reversals represent an aircraft reversing direction through a half loop. The following rules apply to reversals.
 - i. Aircraft perform reversals through transitions, as shown on the Transition Chart.
 - ii. An aircraft performing a transition cannot alter its angle of bank until after the FP in which the transition takes place.
 - iii. Upon performing a transition, the aircraft immediately alters bank angle as described in the Fighting Wing rules. In summary, a LVL banked aircraft becomes INV, and vice versa, while an aircraft in a left or right bank flips into the inverted version of the same bank direction (and vice versa).
 - iv. An aircraft in a LVL or INV bank reverses its direction 180 degrees. An aircraft banked to the left or right reverses its direction 120 degrees in the direction of the bank, regardless of whether the bank is upright or inverted. Thus, an aircraft in a right bank attitude with a heading of 90 degrees would end with a heading of 210 degrees after its reversal.
16. Gaining and Losing Altitude. In simple Fighting Wings, an aircraft receives decel and accel points at 1/3 the rates in Fighting Wings, rounded to the nearest 0.5 point. This applies to altitude gained or lost through VFPs or HFPs, including optional altitude

adjustments. The spreadsheet calculates these decel and accel points automatically, based on the aircraft's starting speed.

17. Climbing. Some aircraft can gain altitude more efficiently by using the Average Rate of Climb process rather than through VFPs or optional altitude when expending HFPs. This generally applies to aircraft with average rates of climb in excess of 2200 feet per minute.

- a. If an aircraft is in upright level flight for an entire move, it may gain altitude increments as shown on the aircraft's supplemental ADC. The aircraft incurs 1 decel point for every 6 altitude increments gained in this way, with decel points rounded to the nearest 0.5 point.
- b. Reduce an aircraft's climb rate by 1 increment if it is not in a level bank.
- c. Aircraft climbing in this way may not gain altitude as described in 12.a above.

18. Initiative.

- a. Roll for initiative using D6. Players should use 1 D6 per aircraft, and place the D6 showing the aircraft's initiative number on or directly behind the aircraft.
- b. Regardless of modifiers, no aircraft can have an initiative of less than 1 or more than 6.
- c. See revised blind spot table to determine whether an aircraft is in the blind spots of opposing aircraft.
- d. There is no tailing in simple Fighting Wings.
- e. The +2 initiative modifier for downing an enemy aircraft lasts for only 1 move. All other modifiers are as in Fighting Wings:
 - i. Recruit pilot -- -4
 - ii. Green pilot -- -2
 - iii. Veteran, ace, hero pilot (each) -- +1
 - iv. Each hero or ace from own side shot down -- -1
- f. Use the following criteria to resolve ties in initiative.
 - i. More experienced pilots move after less experienced pilots, with aces being the most experienced pilots.
 - ii. Among pilots of the same experience, an aircraft that both (1) has an enemy aircraft in its forward 120 degree arc and (2) is in the rear 120 degree arc of that aircraft and (3) a deflection angle of less than 90 degrees moves before that enemy aircraft.
 - iii. Move order not resolved by the above 2 rules is resolved by rolling a die. On an even result, the Allied aircraft move first. On an odd result, the Axis aircraft move first. Roll once for each initiative number, with the result applying to all aircraft having that number. Roll at the moment that move order has to be determined.
- g. Formations. Formation parameters in simple Fighting Wings are:
 - i. Fixed – wingmen behind leader's 3:00 or 9:00 line, within 1 hex and 100 feet of leader, and heading in the same direction as the leader,
 - ii. Fixed sub-flight – sub-flight leader behind leader's 3:00 or 9:00 line, within 3 hexes and 300 feet of leader, and heading in the same direction as the leader,
 - iii. Flexible – wingmen behind leader's 3:00 or 9:00 line, within 2 hexes and 600 feet of leader, and within 60 degrees leader's heading,

- iv. Flexible sub-flight – sub-flight leader behind leader’s 3:00 or 9:00 line, within 3 hexes and 900 feet of leader, and within 60 degrees leader’s heading.
 - v. Wingmen and sub-flight leaders in the same hex as their leader are considered to be behind their leader’s 3:00 or 9:00 line.
 - vi. Fixed formation limits. Fixed formations have all of the same maneuver limits as in Fighting Wings. In addition, they may not transition out of level flight.
19. Combat. Combat resolution in simple Fighting Wings is based on odds.
- a. Each aircraft’s supplement ADC shows its defensive strength, together with the offensive strengths of its weapons at ranges of 0, 1 and 2 hexes.
 - b. Aircraft firing arcs are as in Fighting Wings, except that for fixed gun firing arcs:
 - i. The arc at range 2 consists of the 3 hexes in the aircraft’s 60 degree forward arc that are 2 hexes from the aircraft.
 - ii. An aircraft in a nose-level attitude (“L” or “I”) may shoot at aircraft in its hex if the aircraft is within 3 altitude increments of its altitude and moved before it did. A nose-level aircraft may shoot at any aircraft in the hex directly in front of it if the range to that aircraft, adjusted for any difference in altitude, is 1. A nose-level aircraft may shoot at any aircraft in its range 2 forward arc if the final altitude-adjusted range is in fact 2. As reflected in the spreadsheet range tool, a hex range of 1 increases to 2 if the altitude difference between the 2 aircraft is more than 10 increments, while a range of 2 increases to 3 if the altitude difference between the aircraft is more than 13 increments.
 - iii. Aircraft in C or (C) attitudes may shoot any aircraft within range that are in their firing arcs and are above them.
 - iv. Aircraft in D or (D) attitudes may shoot at any aircraft within range that are in their firing arcs and are below them.
 - c. Altitude adjusted ranges are calculated using the range tool on the spreadsheet. Enter the range in hexes, the target’s altitude and the firer’s altitude as shown on the spreadsheet. The result is the range adjusted for the difference in altitude.
 - d. Combat results are based on odds. Divide the attacking aircraft’s weapon strengths at the relevant range by the target aircraft’s defense strength to compute the odds of the attack. Round the result to the nearest half odds. Roll D10. If the result is less than or equal to the odds, the target aircraft is shot down. If the result is less than or equal to double the odds, the target aircraft is damaged. Any other result has no effect.
 - e. For example, an aircraft with a total weapons strength of 14 attacks an aircraft with a defensive strength of 5. The odds would be 2.5 to 1. The target aircraft would be shot down on a roll of 1 or 2 and damaged on a roll of 3, 4, or 5.
 - f. Multiply the defensive strength of the target by the Fighting Wings deflection modifier to get its final defensive strength. Disregard attitude differences between the target and the firer for this.
 - g. Odds are adjusted up or down by half odds or whole odds, as shown on the Attacking Odds Modifications Chart at the end of these rules. These modifications are cumulative. For example, an upward “half odds” adjustment to the example above would result in odds of 3 to 1. A “full odds” adjustment would

result in odds of 3.5 to 1. Odds of less than 1 to 1 all count as “half odds” for these adjustments.

- h. Because Simple Fighting Wings uses 60 degree aircraft headings rather than 30 degree headings, only 4 deflection angles apply: dead astern (factor of 1), rear 60 degree arc (factor of 3), 120 degree arc (factor of 6), and head-on (factor of 3)
- i. Odds of less than 1 to 1. For odds of less than 1 to 1, roll D10. On a 1, proceed as described below.
 - i. For odds of 1 to 2, roll D10. A 1 through 5 is a shoot down; any other result is damage.
 - ii. For odds of 1 to 3, roll D6. A 1 or 2 is a shutdown; a 3 or 4 is a damage result.
 - iii. For odds of 1 to 4, roll D10. If the result is 5 or less, roll again. A 1 through 5 is a shutdown and a 6 through 10 results in damage.
 - iv. Odds of less than 1 to 1 count as “half odds” for odds shifts on the Firing Modifications chart.
- j. Head-On Attacks. Simple Fighting Wings uses the Fighting Wings rules for head-on attacks, with two exceptions:
 - i. Attacks at a range of 0 are permitted.
 - ii. Aircraft do not check for collisions.
- k. Aiming Shots. In Simple Fighting Wings, players may declare that an aircraft is using nose-mounted weapons to aim wing-mounted weapons. In that case, the aircraft uses 2 units of ammo for its nose guns, but uses a unit of ammo from its wing guns only if the target was damaged or shot down.
- l. Flexible Guns. Flexible guns may only fire at aircraft attacking the aircraft mounting the flexible guns, unless the aircraft with the flexible guns is in a fixed formation.
 - i. Up to 6 aircraft in a fixed formation may fire flexible guns at any aircraft attacking any aircraft in the formation. They fire by combining their attack strengths into 1 attack. Attack strengths in combined attacks are halved, unless the aircraft is firing at the aircraft attacking it. Use the most favorable deflection modifier if more than 1 applies and ignore modifiers for recruit, green, veteran, ace or hero gunners.
 - ii. The supplemental ADCs notes the flexible guns that can bear into various arcs at different altitudes. “High” indicates guns that can fire at altitudes above the aircraft’s altitude. “Same” indicates guns that can fire at the same altitude as that of the aircraft. “Low” indicates guns that can fire at altitudes below the aircraft’s altitude. Arcs indicate the hexes into which the guns can fire, as well as the guns that can fire at an aircraft that closed to 0 range by moving through those hexes.
 - iii. Flexible guns cannot fire in a move in which the aircraft mounting them snap rolled or performed an HT or greater maneuver.
 - iv. If a flexible gun is noted as having a blind spot in a given hex at a given altitude, it may not fire at an aircraft attacking it from that hex at that altitude. However, it may fire at aircraft attacking other aircraft in its fixed formation even if those aircraft are in the hex and at the altitude of the gun’s blind spot.

20. Damaged Aircraft. Damaged aircraft suffer the following effects:

- a. Add 0.5 to all minimum speeds,
 - b. Subtract 1.0 from all maximum speeds,
 - c. Halve all climb rates, dropping fractions,
 - d. Halve available engine power, retaining fractions,
 - e. Shift all attacks by the aircraft up 1 full odds,
 - f. No BT or ET maneuvers permitted.
 - g. Flexible gun attack strengths halved.
 - h. A damaged aircraft that is damaged again is destroyed.
21. Loaded Aircraft. Loaded aircraft suffer the following effects:
- a. Add 1.0 to all minimum speeds.
 - b. Subtract 0.5 from all maximum speeds.
 - c. Reduce all climb rates by 1/3, rounding fractions up.
 - d. Reduce engine power by 1/3, rounding down to the nearest 0.5 accel point,
 - e. Use the loaded ceiling.
 - f. A loaded aircraft that is damaged automatically jettisons its load, becoming unloaded in the turn after it is damaged.
22. Green Pilots. Green pilots suffer from the following effects.
- a. They have a -2 modifier to initiative rolls.
 - b. They may not perform ET turns.
 - c. Their attacks are shifted ½ odds downward.
23. Recruit Pilots. Recruit pilots suffer from the follow effects.
- a. They have a -4 modifier to initiative rolls.
 - b. They may not perform ET turns, BT turns, 4 step transitions, snap rolls or skids.
 - c. Their attacks are shifted 1 odds downward.

Transition Chart

Starting attitude▶		Level	Diving	Climbing	Inverted	Inverted Diving	Inverted Climbing
Ending Attitude▼	Level	See Note A	Pull 1 1/3 V▼	Push 1 ¼V▲	Pull 4 1/2 R 1/2 V▼	Pull 3 1/3 R 1/2 V▼	
	Diving	Push 1 1/3 V▼		Push 2 1/6 V▲ 1/6 V▼	Pull 3 2/3 R 1/2 V▼	Pull 2 1/2 R 2/3 V▼	Pull 4 5/6 R 1/2 V▼
	Climbing	Pull 1 1/3 V▲	Pull 2 1/6 V▼ 1/6 V▲			Pull 4 1/6 R 1/2 V▼	
	Inverted	Pull 4 1/2 R 1/2 V▲		Pull 3 1/3 R 1/2 V▲		Push 1 1/3 V▼	Pull 1 1/3 V▲
	Inverted Diving		Push 2 1/2 R 2/3 V▼	Pull 4 1/6 R 1/2 V▲	Pull 1 1/3V▼		Pull 2 1/6 V▲ 1/6 V▼
	Inverted Climbing	Pull 3 2/3 R 1/2 V▲	Pull 4 5/6 R 1/2 V▲	Pull 2 1/2 R 2/3 V▲	Push 1 1/3 V▲		

A gray box means aircraft cannot move directly to that attitude from its current attitude. A red entry means that red out effects apply. See the rules for push effects on “No F.I.” engines. Triangle indicates direction of VFPs. Fractions before “V” indicate portion of move that must be VFPs. Note that some transitions may include both up and down VFPs. Fractions before “R” indicate FPs traveled before reversal takes place. Moving player can elect to round fractional VFP requirements up or down.

Note A: Aircraft can begin in level flight, climb or dive, and end in level flight. To climb in this way, the aircraft must begin the turn in an upright bank position and be in an inverted bank position while moving through the VFPs used in the latter half of its move. The aircraft moves from ¼ to ½ of its move as upward VFPs and ends in an L attitude. To dive in this way, the aircraft must begin in an inverted bank position after expending the first HFP of its move must and end in an upright bank position. The aircraft moves from ¼ to ½ of its move as downward VFPs and ends in an L attitude. Whether climbing or diving, the transition is a 2 step pull transition.

Turn FP Requirements

AC SPEED	EZ	TT	HT	BT	ET
1-1.5	120 deg	180 deg			
2-2.5	1	120 deg	180 deg		
3-3.5	2	1	120 deg	180 deg	
4-4.5	3	2	1	120 deg	
5-5.5	4	3	2	1	120 deg
6-6.5	5	4	3	2	1
7-7.5	7	5	3	2	1
8-8.5	8	5	4	3	2
9-9.5	10	6	4	3	2
10-10.5	12	7	5	3	2
11-11.5	15	8	6	4	3
12-12.5	17	9	7	5	3

Attack Odds Modifications – Fixed Guns

Adjust 1 full odds up	Firer on target's 6:00 line and performed no maneuver in the last FP of its movement
	Deflection greater than 90 degrees and target has liquid-cooled engine in emergency power
	Firer performed no maneuver in the last 2 FPs of its movement and either (1) has a gyro sight or (2) deflection is less than 90 degrees
	Ace or crack shot firing (each)
Adjust ½ odds up	Deflection greater than 90 degrees and target has air-cooled engine in emergency power or a liquid-cooled engine in another throttle setting.
	Veteran or hero firing (each)
Adjust ½ odds down	Firer used an HT maneuver in the second half of its move
	Firer snap rolled in the second half of its move
	Green pilot firing
	Aircraft in or just completed turn using slats
Adjust 1 full odds down	Firer used a BT maneuver in the second half of its move
	Firer is inverted
	Firer is damaged
	Firer does not have reflector sight and deflection is greater than 30 degrees
	Recruit firing

For this chart, 1 (EZ) and 2 (TT) step transition maneuvers take place in the first half of an aircraft's move, but 3 (BT) and 4 (HT) step transitions take place over the entire move. Slips and skids without turns count as HT maneuvers; skids with turns count as BT maneuvers.

Attack Odds Modifications – Flexible Guns

Adjust 1 full odds up	Deflection greater than 90 degrees and target has liquid-cooled engine in emergency power
	Target is attacking firer, performed no maneuver in the last 2 FPs of its movement and target-to-firer deflection is less than 90 degrees
	Ace or crack shot firing (each)
Adjust ½ odds up	Deflection greater than 90 degrees and target has air-cooled engine in emergency power or a liquid-cooled engine in another throttle setting.
	Veteran or hero firing (each)
Adjust ½ odds down	Green crew firing
Adjust 1 full odds down	Recruit firing

Flexible guns cannot fire in a move if their aircraft performed an HT or greater maneuver or snap rolled. Attack values of flexible guns in damaged aircraft are halved. Up to 6 aircraft in a single fixed formation may combine their fire against any aircraft attacking any aircraft in the formation. Attack values of flexible guns in aircraft not attacked by the target aircraft are halved. Use the most favorable deflection angle of any gun when combining strengths and ignore recruit, green, veteran, ace and hero modifiers. Otherwise, flexible guns may only fire at aircraft attacking the aircraft in which they are mounted.

Blind Spots

	L	C	(C)	(I)	(D)	D
LVL	Rear Low	Front Low				Rear
RB	Rear Low Left Low	Front Low Left Low				Rear Left Low
IRB			Rear Left High	Rear High Left High	Front High Left High	
INV			Rear	Rear High	Front High	
ILB			Rear Right High	Rear High Right High	Front High Right High	
LB	Rear Low Right Low	Front Low Right Low				Rear Right Low

At the start of a move, cross-index an aircraft's bank and pitch attitudes to determine its blind spots. Front and Rear are 60 degree arcs centered on the nose and tail of the aircraft. Left and Right refer to 120 degree arcs centered on each side of the aircraft. Low means below an aircraft's altitude, and High means above it. For aircraft with Rear blind spots (as opposed to Rear Low) a Rear Low or Rear High result on this table means that the aircraft has a Rear blind spot. Aircraft with fair or good cockpit visibility can see aircraft on the lines defining their blind arcs. Aircraft with poor cockpit visibility cannot. An aircraft cannot attack another aircraft with fixed guns if the other aircraft begins the turn in one of the aircraft's blind spots.