

## General Information:

• **Initialization of Spreadsheets.** Before play begins, open the game engine and set the starting altitude for the game (10,000 ft is the default) and duplicate the Game Engine file so that each aircraft in play has its own copy (name these in a way that identifies the aircraft easily). Open these documents and the aircraft data files for the nationalities involved. On the data files, find the columns applicable to the aircraft chosen to be in play. Copy the column for the desired aircraft and paste it into Column A on the game engine copy for that aircraft. Repeat for each aircraft in the game. For each aircraft file, enter the cruise speed given into D3 (the appropriate value is given in E23). Ensure that the starting heading reflects the actual heading of the aircraft (relative to the others in play—two aircraft starting out facing each other cannot both have a starting heading of “0”! Reduce the window for each file so that no data is showing and arrange screen for ease of use. You are now ready to play (as far as the computer is concerned).

• **Game Turn Procedure.** The game turn proceeds as follows:

A) For each aircraft file, copy column E, use a paste special (values only) to paste this information into column D. (This need not be done on turn 1)

A) All players adjust their controls as desired.

B) Players enter their control inputs into the engine file for their aircraft. When finished, command the program to recalculate (this is done manually).

C) All players move aircraft according the data presented by the engine file with the new control inputs Execute any potential shots

• **Situational Awareness and Initiative.** Built into stick MAs calculated by spreadsheet, except for two mods which must be applied manually.

• **Game Scales.** The game uses a constant 2 second game turn (which is based on the speed of human perception and decision abilities). Furthermore, altitude increments are 1/3 the hex scale. Players can set any desired hex scale and should choose one in which the aircraft being modeled will be expected to move around 3 hexes per turn. This size will vary from period to period. Hex scale desired (in feet) should be entered into cell E38. The altitude scale will be computed and automatically displayed in E39. All aircraft in play must have the same scale settings. Default is 100 yards (300 feet) per hex which is a good scale for mid-WW2 aircraft. For WW1 aircraft, 75 foot hexes works well (25 foot increments)

• **Accuracy of Portrayal.** Players need not become overly concerned with making sure their miniatures are at exactly the right roll angle, pitch angle, or altitude. One should strive to make the model match the spreadsheet’s values fairly well (so as to not give false information to the enemy), but the only miniature data with a real game effect is the exact location of the aircraft on the hex grid (for horizontal measurement purposes when a shot is attempted).

## Turning:

• **Facing Changes.** The spreadsheet gives the number of hexes moved and number of facing changes made. The facing changes are integrated into the movement from the last MP forward...in other words, an aircraft moving three with one facing change would make its one change in the last hex moved. No hex can get more than one facing change in it until all hexes have at least one, once all hexes have one, repeat the procedure for the second and so on. The following table gives the distribution of facing changes for an aircraft with 4 MPs for a number of combinations (to illustrate the desired pattern):

Facings	Hex 1	Hex 2	Hex 3	Hex 4
1	0	0	0	1
2	0	0	1	1
3	0	1	1	1
4	1	1	1	1
5	1	1	1	2
6	1	1	2	2
7	1	2	2	2

## Maneuvers:

• **Tailing.** No Tailing Effects at this time.

• **Same Hex / Same Altitude.** This game ignores collision potential and intentional collisions are not allowed. Head on attacks are handled normally, shots are made at the end of turn only, so no shot is allowed the turn of the pass.

• **Wing Teams.** No Wing Team Effects at this time.

## G-Force, Black Out, Damage, and Other:

• **G-Forces.** G-Force effects each turn are given on the spreadsheet and are calculated when the player tells his spreadsheet to recalculate. Recovery occurs through the program as well.

• **G-Force Effects:**

**Red Out.** Cannot Fire.

**Light Grey Out.** Some tunnel vision, not total. Apply modifiers, otherwise no effects.

**Grey Out.** Greater loss of vision, but still aware of surroundings. Apply modifiers (effect greater than Light Greyout, but not incapacitating). There is no additional effect. (Pilot can fire)

**Black Out.** Throttle remains as is, Rudder and Stick zero'd out. No stick changes or fire allowed while blacked out.

• **Black Out Recovery.** Unconsciousness in flight is followed by a period of confusion and reorientation. All of this is handled automatically by the spreadsheet. Confused pilots fly normally, but are subject to modifiers.

### **Basic Fire Combat:**

• **Shot Calculation.** Copy the firer and target a/c data columns from their spread sheets and enter the requested information into the Shot Calculator. If a shot can be made and the player decides to fire, execute the shot by finding the final modifier and adding it to the modifier for each gun group. The final modifier is added to a dice roll (one per group) to determine any hits that are made. Take the number of hits made for each crit number, divide by that crit number, total for all crits numbers in the shot, and truncate—the result is the number of crit hit rolls. After the shot is finished, go to the firer's a/c spreadsheet, enter the shot, The decel from the shot will take effect in the next turn.

• **Tracking Shots.** The player must have made an allowed, real shot against the same target in the previous turn.

### • **Bomber Defensive Guns.**

Use Flex Gun Shot Calculatr rather than fixed gun version. Eyeball fire coverages based on models. Execute each gun as you would fixed guns, best to work on all guns from one firing aircraft vs. one target at a time (before moving on to other firing aircraft). Only the hits from one firing aircraft's guns count toward crits at a time (don't add them all up, etc.).

### **Air to Air Rockets:**

No rules at this time

### **Bombs:**

No rules at this time

### **Modern Weapons (Missiles, Radar, and ECM):**

No rules at this time

### **Aircraft Damage:**

• **Aircraft Damage Factors.** A/C are given two damage numbers (cells E26 and E27) E27 is the number of hits it can absorb before becoming Severely Damaged. E26 is the number it can absorb before being destroyed. A/C become Severely Damaged or destroyed when they accumulate hits **exceeding** the listed numbers.

• **Restrictions on Severely Damaged A/C.** Effects are integrated directly into the program.

### **Special Damage Considerations:**

No rules at this time