dunno yet

Rules for gaming WW1 aircombat with miniatures

CONTENTS

0. PIECES-PARTS

0.10 INTRODUCTION

Generally, the rules are being made available to gain feedback from as great a pool of people as possible —either from reading or playtesting. They are most definitely *not* a finished product...not even close. Rather than infant, they would be better described as larval. Also: I am not a writer – it has been pointed out many times that I have little talent / success in expressing my ideas via print / pixels. I understand / recognize the burden this places on the reader in trying to make sense of the rules as presented, and truly appreciate the effort made to do so. Also Also: The numbers in the game are just best guesses to get by on so that the concept can be explored —no surprise will be registered on my part if you discover an error or inconsistency in any of the numbers.

That said (if you're not scared away yet), I would sincerely appreciate any comments / questions you may wish to send my way concerning the rules and/or your attempts to play a game using them. It is the discussion / critique of the *concept* that I am most interested in pursuing. I am by no means an expert (or even competent) at either game design or WW1 aircombat, so fire away and have no concern for my delicate sensibilities.

You may email me directly: donglewwe@gmail.com
or post on the discussion forum on The Wargames Website:
http://www.thewargameswebsite.com/forums/topic/gweirdas-odd-pov/

Please don't take the presentation of these rules (or the concept behind them) as proselytizing, or as advocating a boycott of other games or refuting the fun that can be had in meeting their challenges. I'm only trying to present a different kind of challenge to the aircombat gamer that doesn't involve time-motion or game mechanics that rely on moving / pointing the little models at each other. Sword fighting games don't require gamers with a casual interest to have / display fencing skills, and I don't see why aircombat games should purposefully (through intent or neglect) erect a –what I believe to be artificial- barrier of piloting / time-motion aptitude to those interested in gaming (i.e.: having fun with) the genre.

As to the pieces-parts required: It's assumed that whatever may be at hand is good enough to try things out. I'm happy to share the methods I've used for managing / recording the various states and effects – just drop me a line and I'll answer as best I can.

0.2 DESIGNER NOTES

0.21 GENERAL

These rules aim to put gamers in the heads of their warrior alter-egos, concerned with and deciding *what* to do, rather than in the bodies concerned with and deciding *how* to do it.

Instead of choosing which specific move / maneuver to use to position a model on the tabletop (as is common in most aircombat games) players in this game choose amongst tactical objectives (such as "attack that guy" or "be over there") and then decide on the risk level undertaken to achieve that goal. The success of an effort is determined in a manner like most/all RPGs, i.e.: by dice rolls that are influenced by pilot / aircraft quality and the level of risk chosen.

In addition to the difference in decisions made, the level of control held by players regarding the positioning of the models (and the degree of detail of the action displayed on the tabletop) is very different from -and significantly less than- that found in the games common to the genre in which a player's chief (if not only) concern / input involves the movement and positioning of models on the playing surface.

The point-of-view of this game is similar to that of many / most hand-to-hand skirmish games: Players control the general movement and actions of their character-warriors, but once in close combat their concern (and control / input) lies not in the specific details of each cut and thrust but instead with the overall tactical intent that I believe occupies the mind of the warrior being represented on the tabletop much more than the technical motions and actions of hand-to-hand combat —or, in the case of aerial combat: the movement and positioning (i.e.: flying) of the aircraft. I believe that pilots don't think much about flying (I didn't) —any more so than martial artists think much about hand / arm positioning or footwork (I didn't). I therefore believe that players shouldn't have to think much about flying either.

I recognize the oddity of this idea and have received quite a few doses of vitriol from aircombat devotees who bristle at the thought that they let go of the control stick. I ask that a deep breath be taken, the premise accepted that the training and experience of the little fellow in the model (not the player) can handle the nuts and bolts of flying the aircraft and that the question be asked: What are the essential decisions made by a pilot in a dogfight?

I don't think they're anything like those asked of players in most games that involve moving a model on the tabletop, the answers to which are things like "I'll do a wingover" or "Maneuver 27 is the thing to do". I think they're more along the lines of "I want to shoot at that guy" or "I need to get away!" As stated earlier: decisions on *what* to do, not *how* to do it —the details are left to the model's pilot (and the player's imagination). The issue concerning the progress of the game is answering tactical-level questions such as: Can I shoot? (-or be shot at)...if so, how good a shot is it? or: What's my position –good? ...bad? ...dangerous? That's all that really matters. The rest is just window-dressing -fun to imagine and great to flesh out the story (I'm all for both), but not something that is necessary to game the genre.

0.22 MOVEMENT

"Always in motion is the tabletop". In keeping with the idea that the game aims to be as far from Aerial Chess as can be, both the placement and movement of the models on the tabletop contain a fair amount of approximation / randomization. There is a purposeful 'Fog of Movement' built into the game. The goal is to create in players a sense of uncertainty in an arena where everything – themselves, their allies and opponents, and even the terrain itself- is constantly moving.

To this end, there is no representation made on the tabletop of an aircraft's specific position at a particular point in time. While general movement on the table is hex-based and is handled as with similar miniatures games (with the addition of a randomization factor), the hexes used represent large, amorphous areas (approximately 600' across –meant to be interpreted as combat / engagement range) within which any number of aircraft can exist.

The larger hexes make the position / display of the models on the table more abstract than in other games – the only things that can be said of any two models are whether they are in effective combat range of each other, or a rough idea of their separation. Because the movement allowance between hexes is randomized, and some models have no specific facing or pitch and can be moved randomly to an adjacent hex during the course of a move, players cannot tell by surveying the tabletop exactly where anything is or how long it will take to move a particular distance – this is intentional.

Models will not move on the table as predictable chess pieces. When one considers the quality of the machines of the time being handled by fallible (though skilled) men such precision-controlled movement seems unlikely if not outright impossible. Total chaos and unpredictability, however, is not the objective of the concept. The odds for the success of many/most moves are very good (or, in the case of simple turns and such: guaranteed). But the gremlins are always out there, and maneuver difficulty (e.g.: tight turns or aerobatics), poor pilot skill (either initial or modified by wounds), and/or aircraft quality (as with pilot skill: either initial or the result of damage) can combine to lessen the odds of success –which also increases the risks / dangers involved in failure- making it harder for a player to calmly plot future moves with a great deal of certainty.

The intent of this is to communicate to players a particular mood of a WW1 dogfight stemming from the unreliability of the machines involved and the inability of the pilots to control these aircraft (and themselves) in a predictable, calculated fashion. Risk and uncertainty yielding peril and opportunity: that is the mood that these rules attempt to create for players. Whether that can be the source of enjoyment / fun in the play of a game depends entirely on personal taste / preference.

0.23 COMBAT

Firing and damage is handled as in most other games. Dice are rolled (modified by both pilot skill and aircraft quality / status) to determine the number of hits, critical hits (affecting vital parts of the target), and possible jamming. An oddity of the rules is that a target may suffer an infinite number of hits. Barring a catastrophic critical hit, any number of rifle-caliber holes can be accumulated, and an aircraft will still be in the game –albeit restricted in maneuver. Sure kills are hard to come by and require persistence (most likely in the face of other enemy aircraft) or a lucky shot.

Specific (and singular) targeting is a key part of combat. A pilot must have a valid target spotted / logged in order to fire and may only fire on that particular target. In a crowded sky this can leave one vulnerable to other enemies and makes having a mate around to cover your back essential.

The main difference in how combat is treated relates to the physical positioning of the models on the tabletop during the course of play. Firing opportunities are indicated not by model position but are instead represented by an abstract, numerical rating (see 'Combat Value' in glossary) that shows which of any two aircraft hold the upper hand as far as position goes.

Players wishing to shoot at an enemy must -instead of pointing their model at the intended target model- succeed in skill rolls representing efforts to maneuver / move into a position that will gain them an abstract numerical advantage over their opponent. The amount of gain in position obtained in any turn is determined by the size of risk taken (from the pool of available options) and the success of the dice roll.

I readily concede that rolling dice and tracking numbers is not nearly as visually dramatic as placing one's model on the tail of another after completing a tricky High Yo-Yo maneuver, but I feel that relying on imagination to fill in that gap is not only possible but can be a part of a successful / satisfying game (as is demonstrated regularly in many -all?- role-playing gaming systems).

0.24 DICE / NUMBERS

The game uses six-sided dice exclusively to keep things as simple (and accessible) as possible. This means that the granularity of performance and outcomes are much rougher than some desire. An example would be speeds which are digitized into ~11.33mph increments to allow for random movement allowances based on a single die roll. To be honest, a difference of 10 mph would be significant at the time (when the range of speeds is barely ten times that) and so using, perhaps, a d10 for this part of the game would better reflect the performance reality of the day. It's one of those nuts-and-bolts fiddly bits that can be worked on if/when the concept proves viable.

The same can be said of ratings and modifiers, which were assigned based on simplicity and ease of memorization. Where possible whole numbers were used and fractions kept to a minimum –keeping (if possible) to 'half'- and ranges relegated to basic progressions (e.g.: 1, 2, 3...). I will readily admit that these in no way represent the result of diligent math work on my part. I spent (wasted, really) much time years ago at the beginning of this venture seeking accurate data on the aircraft and their performance. Frustration (and the many answers to be found from various sources) led me to abandon that road and to instead concentrate on just getting something done that could be used to evaluate the key design concepts that differ from the other games available.

0.30 GLOSSARY

These are terms unique(?) to the rules – or at least 'do not mean what you think they mean'.

COMBAT VALUE (abbr: CV)
Number that rates the spatial advantage / disadvantage held relative to another aircraft regarding both the quality of shot that may be taken as well as the tailing bonus that may be carried into future turns. The values range from 1-10 or their reciprocals (negatives are possible because the CVs of two aircraft can be reciprocals – e.g.: +5 and -5- if they are targeting each other). The maximum of 10 is meant to put a limit on how good a position may be obtained and represents an aircraft on another's 'six' at very close range.

GOING SOMEWHERE
Movement status of a model that represents an aircraft that spends the turn moving in a particular direction. Models moving in this way will (given enough speed) move to an adjacent hex and/or level. The move may include a single change in direction (in 60° increments) and/or pitch (in step-level increments - see 2.41) as well as aerobatics that do not affect the overall direction of the movement within those increments (e.g.: slip, barrel roll, etc...).

MANEUVERING
Movement status of a model that represents an aircraft that spends the turn moving in no particular direction (i.e.: where the aircraft's facing and/or pitch is often changing during the turn). Models moving in this way may remain in their current hex or be moved to an adjacent hex. This move may include aerobatics or simply represent constant turning within the current hex.

MOVEMENT TEST (abbr: MT)
Dice rolls to determine the success of changes in facing / pitch or attempts in maneuvering , as well as the gain in CV (if any) for the move. A more difficult move (i.e.: one that requires a riskier dice roll) results in a greater CV gain for success as well as a higher penalty for failure.

MOVEMENT TEST LEVEL (abbr: MT#)
Movement Tests are rated by their difficulty / intensity and have a numerical level: 0, 1, 2, 3, or 4. This can be roughly translated as (0)training school, (1)basic flying, (2)combat flying, (3)pushing it, and (4)pulling the wings off. The level is written as "MTx" where x equals the numerical level (e.g.: MT1, MT3). The MT level affects initiative, orientation, target acquisition, and firing -generally, the more difficult / violent the current movement being done, the harder it is to do other things.

PILOT POINTS (abbr: PP)
Number that represents the overall capability to act effectively within a combat environment. The points may be used during a turn to modify dice rolls, improve the success or cancel the failure of skill rolls, and/or 'buy' dice with which to attempt various tasks. Each point may only be used once per turn. The points are restored at the beginning of each turn but are reduced by wounds and/or damage to the aircraft.

0.4 EQUIPMENT

0.41 GAMING AREA

The gaming surface is divided into hexes which represent engagement / combat zones that are approximately 600' across (meant to represent effective gunnery range).

The size of the hexes on the playing surface is influenced by the miniatures used as well as the table size (and reach of players). They should be large enough to allow at least four to six models to occupy a single hex, and to allow for a reasonable amount of space in which to game an encounter –a minimum of a 6 x 6 hex area is recommended, though this is highly dependent on the scenario.

An “open seas” convention (shifting all the pieces an equal number of spaces) can be used to adjust the playing area should the action move close to the edge of the table. Side-boards (in the form of single, larger hexes) can also be used (ala “Axis and Allies” battle boards) to accommodate the engagement of a greater number of aircraft crowding a single hex.

0.42 MINIATURES

The facing (horizontal and vertical), movement status, MT level, speed, altitude, target, combat value, and ID are characteristics of all aircraft that should be indicated with the model / stand and visible to all around the table. Logs can be used for any/all of these factors but avoiding the drag such place on play (by forcing players to ask each other for the information) is well worth the effort of devising / constructing / buying a public means of displaying the information on the gaming table.

- *Facing (horizontal)* should indicate one of the six adjacent hexes.
- *Facing (vertical)* should indicate the occupied level or an adjacent level.
- *Movement status* should indicate the aircraft's current movement type: either 'Going Somewhere' or 'Maneuvering'.

> *For both vertical facing and movement status, the pitching / banking of the model works well. There are many means of accomplishing this -methods range from magnets to alligator clips to flexible straws. An alternative to physically moving the models would be to use chits / markers to display the state of a model’s pitch and/or movement status.*

- *MT level* should indicate the aircraft's current level (range 0-4). I use magnetized colored chits (yellow, orange, red, brown). Level zero is the default status and requires no marker.

- *Speed* should indicate the aircraft's current speed (range = 0-15+). This can be done with some sort of dial or scale or chits.

- *Altitude* should indicate the height of each aircraft. This can be done either with telescoping / multiple-section stands or counter / chit indicators.

- *Target* should indicate whether the pilot has a current spot. If within the same hex the ID of the target should also be indicated.

- *Combat Value* should indicate the current CV held by the pilot on a current target.

- *ID* should indicate a unique label for each aircraft. This can be a single generic letter or numeral.

.043 AIRCRAFT LOGS
Each aircraft has stats that will need to be referenced, as well as things to be tracked through the course of play (e.g.: damage, Pilot Point use -I insert logs into sheet-protectors and mark with a grease pencil).

For initial games (that include a minimum of modifiers) all aircraft should be single-seat fighters that share the same, 'average' qualities, and all pilots should be 'average' as well. A log with these recommended stats is included after the appendices.

.044 QUICK REFERENCE SHEET
Included at the end after the aircraft logs. This contains many of the charts and such as well as the basics of the turn sequence and should serve to answer most questions concerning dice rolls / modifiers that arise during play.

1. HOUSEKEEPING PHASE

1.10 PILOT / CREW POINTS

Each allotment of pilot or crew points is reset to its starting amount minus points lost through wounds and/or damage to the aircraft.

1.20 MORALE

A pilot must take a morale check if at the beginning of the turn his aircraft is on fire, has its engine destroyed (or shut off), is out of ammunition, has a wounded pilot/crew, or has taken hits from an untargeted enemy in the previous turn. A pool of dice is rolled, and a single six is required to pass.

The number of dice is based on experience (1-5, *dismal→great)* and is modified by the pluck rating.

1.30 INITIATIVE

Each aircraft rolls one die and modifies it by pilot experience (*good* or *great* may add or subtract) and MT level (subtract 0, 1, 2, 3, or 4). A targeting aircraft may –upon its turn- adjust its initiative based on its current CV and/or tailing position.

1.40 CLOSE ENCOUNTERS / COLLISION

Any two aircraft that begin a turn in the same hex and level and have matching initiative numbers posted must make a Close Encounter check. Neither aircraft may be targeting the other.

Each aircraft rolls one die. Pilot Points may be paid to adjust the roll at the cost of one Point per ±1.

Modifiers: MT level = +1 /level, Speed = -1 /point <4 or +1 /point >5, Targeting = +3.

Sum rolls to get the Close Encounter Rating: <10 = 0, 10-11 = 1, 12-13 = 2, 14-15 = 3, 16+ = 4

If the Rating is greater than zero mark the aircraft as having a close encounter. They may make MTs *(during their turn in movement order)* to avoid a collision. For every CV point gained by either / both of the two aircraft to avoid collision *(as if targeting for combat)* the Rating is reduced by one *and the aircraft loses any current target.* If the Rating is reduced to zero no collision occurs. If the Rating is reduced to zero by the first aircraft, the second may move without regard to the collision threat.

If during their movement turns the two aircraft fail to reduce the Rating to zero they will collide. Both aircraft immediately take damage (prior to any combat): Each aircraft rolls a number of dice equal to the remaining Rating – these are treated as hits suffered in normal combat and include the chance of critical hits. Any targets held by either of the aircraft (if not already lost) are lost, and both pilots must take a morale check next turn (as if taken hits from an untargeted enemy).

1.50 COMBAT VALUE (CV) ADJUSTMENT

Any existing CV is adjusted based on the relative position and range to the target aircraft.

POSITION: If the target is behind (areas 4, 5, & 6) reduce pilot CV to zero.

RANGE: If the range to the target is one hex or altitude level* reduce CV by half. If the range to the target is more than one hex or altitude level* reduce CV to zero.

** ignore first altitude level if the target is below targeting aircraft*

MAXIMUM: Reduce adjusted CV to a maximum of 10.

2. MOVEMENT PHASE

2.10 MOVEMENT ORDER

Aircraft take turns moving in initiative order (low to high) within the following categories:
1) spinning or burning aircraft
2) aircraft whose pilots are attempting to reload, unjam, or who failed a morale check
3) targeting aircraft
4) non-targeting aircraft

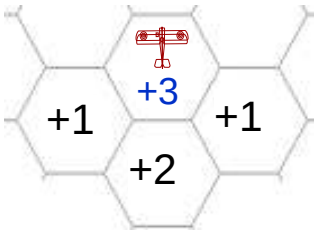
Ties within categories go to the higher altitude, the higher speed, or - if still tied- resolved by a roll-off

2.11 TAILING AND CV BONUSES

Upon its turn, an aircraft may adjust its initiative -in move order- via CV advantage and/or tailing. If the modified initiative exceeds the posted initiative of its target the aircraft is moved immediately before or after the target (player's choice). If the modified initiative matches, resolve as ties above.

CV advantage: If the target has declared a spot of its own the full CV may be added. If the target has no spot of its own only half of the targeting pilot's CV may be added.

Tailing: The diagram shows the number gained for CV and initiative by a targeting aircraft if it occupies one of the numbered hexes shown *and* has the target aircraft to its front (if not maneuvering).



The +3 bonus may only be gained if the targeting aircraft is maneuvering *and* the target aircraft is going somewhere, or if both aircraft are going somewhere *and* the targeting aircraft has an existing CV advantage.

⟶ *NOTE: Maneuvering aircraft have no facing, so no tailing bonuses can be gained on them.* ⟵

2.12 SPINNING

Spinning aircraft move vertically in the current hex in a normal dive as per the normal movement rules with the exception that it remains in the current hex and only gains one point of speed for the dive.

RECOVERY: Recovery may be attempted at the end of the move. Recovery is made by rolling a six on a die. Pilot points are used to buy dice (on a 1-for-1 basis). All dice must be rolled together.

If successful, the pitch remains in a normal dive and the facing of the aircraft is determined randomly. This facing may be modified by pilot points, if available, by one hexside per point used.

2.13 EXTINGUISHING FIRE

If an aircraft is on fire an attempt may be made to put it out: Roll 1d if a shallow dive, 2d if normal, and 3d if steep. Additional dice may be bought with Pilot Points (on a 1-for-1 basis). The number of dice is modified by the Pilot's Flying Skill. All dice must be rolled together. No other action may be taken.

- Each result of six extinguishes the fire of the highest row of damage boxes that has suffered fire damage (any filled boxes remain ineligible for future damage marks).
- Each result of one indicates the fire has increased: Fill in two damage boxes per one rolled. Pilot Points may be used (on a 1-for-1 basis) to cancel these ones to eliminate their effect.

2.14 RELOADING

If the pilot is reloading, the aircraft is moved straight and level in its current direction or, if currently *maneuvering*, as determined randomly.

To reload, a six must be rolled on a die. Dice cost one pilot/crew point each. Only one roll may be made per turn and all dice must be rolled together. Crew get a bonus of one die.

If the first attempt is unsuccessful the number of dice rolled may be increased by the ordinal number of additional (consecutive) attempts (ie: one for the first, two for the second, three for the third, etc...).

If three ones are rolled in an attempt the magazine/drum is lost. Remaining pilot/crew points (if any) may be used to cancel any of the ones rolled (on a one-for-one basis) to reduce their number to less than three and avoid the loss. If another magazine/drum is available the reloading process may be begun again on a following turn (with the loss of any consecutive attempt bonus dice).

2.15 UNJAMMING

A pilot (or crew) may attempt to fix a jammed gun. The procedure for unjamming is the same as described above for reloading except that the additional dice gained for consecutive attempts is one per turn regardless of the number of turns.

If three ones are rolled in an attempt the gun is broken and may not fire for the rest of the game. Remaining pilot/crew points (if any) may be used to cancel any of the ones rolled (on a one-for-one basis) to reduce their number to less than three and avoid the breakage.

2.16 FAILED MORALE

For failed checks in cases of fire, engine out, no ammunition, or wounding the aircraft must move towards a friendly edge and/or off the table by the (most apparent) safe route – roll to determine path if more than one option is available.

For failed checks when hits have been taken from an untargeted enemy roll 1d, subtract one for every hit more than two, and apply the result shown below:

≤ 0 = Maneuver, level 2 MT, remain in current hex (if speed >12 move to random adjacent hex)
1-3 = Maneuver, level 1 MT, remain in current hex (if speed >6, move to random adjacent hex)
4-6 = Move / turn in random direction (take MT if speed requires)

2.17 BROWNOUT

The aircraft is moved straight and level in its current direction (including pitch) or, if currently *maneuvering*, as determined randomly.

To recover, a six must be rolled on a die. The number of dice rolled equals the number of turns the attempt has been made. Pilots with 'good' or 'great' experience add one or two dice (respectively).

2.20 SPEED

Actions taken during a move are made based on an aircraft's starting speed.

All adjustments to speed (via power, drag, and/or movement) are tracked through the course of the move and yield an ending speed. Actions taken after movement (such as combat) as well as effects on performance (such as stall / spin checks) are made based on an aircraft's ending speed.

An aircraft's ending speed becomes its starting speed for the following turn.

2.21 MINIMUM AND MAXIMUM SPEEDS

Aircraft have a minimum speed, maximum speed, and maximum dive speed. IMPORTANT NOTE: These numbers vary as the result of the current movement test level, altitude, and/or damage.

Aircraft that end their move at or below minimum speed must immediately take a stall / spin test.

Aircraft that end their move above maximum speed must immediately roll for drag.
Diving aircraft *(including maneuvering aircraft that move to a new level)* subtract the step level of their dive (-1 for shallow, -2 for normal, or -3 for steep) from the roll.

Aircraft that end their move above maximum dive speed must immediately take a stress test.

2.22 SPEED INCREASE (Power and Diving)

Power: Roll 1d modified by the power rating. One point of speed is gained if the result is >2.

Aircraft at minimum speed *and* MT level 0 add one to any power roll made.
Aircraft at one less than maximum level speed subtract one from any power roll made.
Aircraft at or above maximum level speed may not use power to increase speed.

Diving: An aircraft that changes its pitch to a dive gains speed equal to the step level of the dive minus one (0 for shallow, +1 for normal, +2 for steep). An aircraft spending the entire turn diving (this includes a maneuvering aircraft that moves into a new altitude level) gains speed equal to the step level of the dive (+1 for shallow, +2 for normal, +3 for steep).

2.23 SPEED DECREASE (Drag, Climbing, and Movement Tests)

Drag: Roll 1d modified by the drag rating and/or dive status*.

** If in a shallow dive subtract 1 from the roll, a normal dive subtract 2, and a steep dive subtract 3.*

One point of speed is lost if the result is >2, and two points are lost if the result is >6.
If the roll is voluntary an aircraft rolling >6 may choose to lose only one of the two points.

Climbing: An aircraft that changes its pitch to a climb loses speed equal to the step level of the climb minus one (0 for shallow, -1 for normal, -2 for steep). An aircraft spending the entire turn climbing (this includes a maneuvering aircraft that moves into a new altitude level) loses speed equal to the step level of the climb (-1 for shallow, -2 for normal, -3 for steep).

Movement Test: Aircraft that take an MT may suffer a speed loss and/or be required to make a drag roll because of the test, and pilot points may be used with aerobatic dice to reduce speed.

2.30 MOVEMENT POINTS (MP)

The amount an aircraft moves each turn is based on an allotment of movement points. An aircraft's allotment of MP is based on the sum of its starting speed and a die roll and may be modified by pilot points and/or CV points (tailing or being tailed by a target aircraft). The allotment is also adjusted by/for vertical movement if the aircraft is climbing or diving.

An aircraft must use its entire allotment of movement points in its move.

2.31 DETERMINING NUMBER OF MOVEMENT POINTS

At the beginning of an aircraft's turn to move a die is rolled and the result added to the starting speed to determine the MP allotted that turn:

Sum < 4 = **0** MP, 4 – 9 = **1** MP, 10 – 15 = **2** MP, 16 – 21 = **3** MP, 22+ = **4** MP

Aircraft in a formation all use a single MP roll by the leader added to their own individual speeds.

MANEUVERING: Aircraft that are currently maneuvering subtract 2 from the MP roll.

CLIMBING / DIVING: The number of MP allotted for each type of movement (horizontal and vertical) is determined by the same MP die roll but may differ from each other.

To determine the horizontal MP for an aircraft in a normal climb/dive subtract 3 from the MP roll, and if in a steep climb/dive subtract 6 from the MP roll.

To determine the vertical MP for an aircraft in a shallow climb/dive subtract 6 from the MP roll, and if in a normal climb/dive subtract 3 from the MP roll.
(NOTE: The MP roll of a climbing aircraft is modified by its climb rating to determine the vertical MP allotment.)

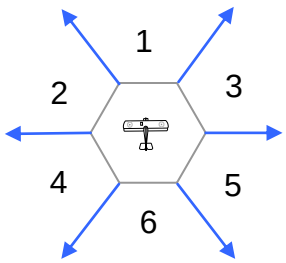
CV BONUS (Tailing): If the aircraft has an existing spot and CV bonus on another *(and the target aircraft has already moved),* the player may add or subtract half the CV (round down) to the MP roll.

PILOT POINTS: Player may add or subtract one from the MP roll for every two points spent.

2.40 MOVEMENT

An aircraft spends each of its allotted MP either 'going somewhere' or 'maneuvering'. An aircraft with more than one MP allotted may use the two types of movement in any order. If more than one MP is available, facing/pitch changes attempted may be 'spread over' two hexes to use the lesser of required MT levels (2.50), e.g.: two 60-degree facings may be used in two hexes to execute a 120-degree turn by succeeding in a single, 60-deg facing movement test.

The adjacent hexes are numbered as shown in the diagram to the right.



The areas of space surrounding the aircraft share the labels – the edges of the areas are formed by extending the shared edges of the numbered hexes (roll a die to assign ownership of hexes split by the extended edges).

'Front' is areas 1, 2, and 3; 'Behind' is areas 4, 5, and 6; 'Nose' is 1; 'Tail' is 6; and 'Left' and 'Right' are 2 and 4, and 3 and 5, respectively.

2.40 MOVEMENT (cont'd)

2.41 GOING SOMEWHERE

Aircraft moving in this fashion are shown facing an adjacent hex and level – if climbing or diving they are further subdivided as either shallow, normal, or steep.

VERTICAL MOVEMENT: Any change in the pitch of an aircraft that is *going somewhere* must be declared at the beginning of its move – there is no MP cost for the pitch change, and if the required movement test is passed the model will move to a new level (if enough vertical MP are allotted by the MP roll). If the move includes a facing change, the pitching movement test is resolved with it.

AEROBATICS: Aircraft that are going somewhere that do not attempt a facing or pitch change may choose to take a movement test to gain CV. The test level may not exceed one less than that required for maneuvering and only aerobatic, penalty, and/or pilot bonus dice may be rolled.

AIRCRAFT THAT ARE CURRENTLY GOING SOMEWHERE are moved into the adjacent, faced hex/level at the cost of one MP. After the model is moved (including zero hexes) it may change its facing to any of the adjacent hexes. There is no MP cost for making a facing change.

AIRCRAFT THAT ARE CURRENTLY MANEUVERING first determine the facing/pitch of the model randomly (1-6 for facing; 1-2 down, 3-4 level, 5-6 up for pitch). This result may be adjusted based on the current CV if the target aircraft is in a different hex (for facing) or level (for pitch) by shifting the facing/pitch one hexside/step (climb-level-dive) in player's choice for each CV point held. The result may also be adjusted by paying pilot points at the cost of one PP for each hexside/step, but the pool of available PP is first reduced by the current MT level of the aircraft. *(NOTE: This pool reduction does not use the PP, but only temporarily removes them from the amount available for this application.)*

After the facing/pitch is determined the status of the aircraft is changed to *going somewhere* and the model is moved into the adjacent, faced hex/level at the cost of one MP.

2.42 MANEUVERING

Aircraft moving in this fashion are shown with the wings of the model banked *(or by some other indicator).* The aircraft is assumed to have no particular facing or pitch.

AIRCRAFT THAT ARE CURRENTLY GOING SOMEWHERE remain in their current hex/level at the cost of one MP.

AIRCRAFT THAT ARE CURRENTLY MANEUVERING may either remain in their current hex/level or move to an adjacent hex/level at the cost of one MP.

Currently *maneuvering* aircraft that choose to remain in their current hex/level may change their movement type to *going somewhere*. A *maneuvering* MT is taken and –if successful- the model is marked to indicate the new status and set at any facing/pitch within the current hex.

Currently *maneuvering* aircraft that choose to move into an adjacent hex/level must first determine the facing/pitch of the model randomly *(as detailed above in 2.41, including adjustment).*
The aircraft is then moved into the resulting adjacent hex/level in either *going somewhere* or *maneuvering* status (player choice). The MT level required is one less than the one indicated on the MT Table *(and may <u>not</u> be increased or decreased).* Aircraft that have changed their status to *going somewhere* may not make a facing/pitch change in the new hex.

2.50 MOVEMENT TEST (MT)

Aircraft that maneuver or change pitch/facing may be required to take a movement test to succeed. Multiple actions (i.e. - facing plus pitch change) should be tested at the highest test level required plus penalty dice equal to the level of the other test. Only a single test may be taken in each hex.

A movement test involves rolling a number of dice dependent on the level dictated by the MT Table (2.51) and is affected by the aircraft speed, intended task, and -sometimes- player choice.

MOVEMENT DICE: Movement dice are required dice - a player must roll all of the listed amount.

AEROBATIC DICE: Aerobatic dice are optional dice – a player may roll some, none, or all of the listed amount. The available pool of aerobatic dice is adjusted by the aircraft aerobatic rating and the pilot's flying skill. Aerobatic dice are treated as movement dice regarding the gain of CV bonuses.

BONUS DICE: Bonus dice are optional dice that come from aircraft move ratings and/or pilot flying skill ratings - players may choose to roll some, none, or all of the available pool. Bonus dice may be used to replace existing movement dice or to remove *(not replace)* existing penalty dice. In addition to this use, bonus dice from pilot flying ratings may be used as additional movement dice.

PENALTY DICE: Penalty dice are required dice that come from aircraft move ratings, pilot flying skill ratings, aircraft damage taken during play (either as an accumulation of hits or of critical hits to the controls), or from pitch-down or multiple-task tests. Penalty dice are treated as movement dice for the determination of test failure only - no CV bonuses are gained by them.

POWER DIE: A Power die should be rolled with the test – players have the option to ignore its results.

2.51 MT TABLE

Cross-reference speed and task to find the MT level required

speed / task	<3	3	4	5	6	7	8	9	10-11	12-14	15-17	18+
60°,2 steps*	P	0	1	1	1	2	2	2	3	3	4	X
120°,3 steps*	P	1	1	1	2	2	2	3	3	4	X	X
180°,4 steps*	0	1	1	2	2	3	3	3	4	X	X	X

* for pitching up only - roll one penalty die if pitching down > 3 steps

- infer rows above 2-step for 1-step change and below 4-step for 5- or 6-step changes

- reduce MT level shown by one if pitching up from level or climbing status

- may shift up one row if facing change made while climbing or diving (normal or steep pitch)

Maneuvering Tests use the bottom row of the table:

- may choose higher than indicated MT level (unless moving to new level or hex)

- *must use* one less than indicated MT level if moving a hex

2.50 MOVEMENT TEST (cont'd)

2.52 MT LEVEL

In addition to governing the dice rolls for a test, the MT level of an aircraft affects initiative, orientation, target acquisition, and firing. Aircraft remain at the current test level until a new test is taken.

When taking a movement test consult the table below to find the number of movement dice to be rolled, the maximum aerobatic dice that may be rolled, the CV points gained, what rolls result in CV bonuses or test failure, and effect on speed for the test level required / chosen.

lvl	move	aero	CV bonus	MT failure	spd*
0	0	1	6s	2x **1**s	NE
1	1	2	6s	**1**s	p -1
2	2	3	5s & 6s	**1**s	-1
3	3	1	**4**s,**5**s,& **6**s	**1**s & **2**s	-3
4	4	0	**4**s,**5**s,& **6**s	**1**s,**2**s,& **3**s	-6

***** lose 1 point of speed for every two aero dice rolled

2.53 PITCH-DOWN CHANGES

An aircraft that is *going somewhere* attempting to lower its pitch by more than 3 steps must roll a penalty die for every two steps greater than 3 of pitch change (rounded down) – this may be as the only roll required in the hex or in addition to a test for any facing change made.

2.54 CV GAINS AND APPLICATIONS

One CV point is gained for each movement die and for every two aerobatic dice rolled in a Test.

A pilot / crew point may be paid to double a CV point gained in a test. Pilot points may also be paid to add to the CV total gained in a test - the cost of a CV point added is based on a pilot's flying skill:
-2 skill = 5 PP cost, -1 skill = 4 PP cost, 0 skill = 3 PP cost, +1 skill = 2 PP cost, +2 skill = 1 PP cost.

If the aircraft is testing while going somewhere or testing for maneuvering in a hex adjacent to (or in an altitude below) their target the CV gained in the test is halved. Aircraft testing for maneuvering beyond a range of one hex or altitude level gain no CV for the test.

CV gained by pilots who have a current spot on a target are both added to the current player's CV and subtracted from the CV of those that have targeted the current aircraft. CV gained by pilots who do not have a current spot are only subtracted from those that have targeted them.

DEFENSIVE CV APPLICATION: Pilots with a current spot on the testing aircraft reduce their CV by the CV gained in the test *only if* the pilot of the testing aircraft has a current spot on them. If the testing pilot has no spot on them then they reduce their CV by half of the CV gained in the test.

CREW CV APPLICATION: A player may choose to apply the CV gained in a test to a crew of his aircraft (in place of - not in addition to- the pilot). Both pilot and crew must have a current spot on the same target. The CV applied to the crew is divided by the MT level of the test.

Enemy Crew with a current spot on the testing aircraft reduce their CV by half the CV gained.

2.50 MOVEMENT TEST (cont'd)

2.55 SPEED EFFECTS

In addition to the speed reductions indicated on the MT table in 2.52, a PP and an (unused) aerobatic die (or two PP) may be paid to reduce speed by one point. This may be done for a maximum of two speed points, and the resulting total speed loss in any single turn may not exceed one third of the aircraft's starting speed (rounded up).

2.56 FAILURE EFFECTS

All of the effects of a failure roll on any movement, aerobatic, or penalty die may be cancelled by the use a PP (on a 1-for-1 basis). The effects of any uncancelled rolls is detailed below.

CV gain: Each failure on the roll of any movement, aerobatic, or penalty die results in the halving of the total CV gained in the test. *(NOTE: This is cumulative, and may result in no gain for the test.)*

Stress: Roll 1d for each failure on all test *dice (except bonus dice),* sum the rolls, and divide the sum by five *(rounded down)* - if the result is greater than one the aircraft must take a stress test, with a penalty of -1 on the stress test roll for every point greater than one.

Movement type: Failure rolls on any dice in a test have no effect on the movement type - the aircraft remains in the status chosen for the test (going somewhere or maneuvering).

Additional failure effects are dependent on the type of die rolled in the test.

Movement dice: Failure on a movement die in testing while *going somewhere* results in a reduction in the number of hexsides and/or steps attempted in the test. If the number of failures is greater than these, lower the aircraft's pitch by one step and/or increase speed loss by one for each excess failure.

Failure on a movement die for an aircraft testing while *maneuvering* results in the move of the model to a random adjacent hex. Any previously moved aircraft that have a current spot on the shifted aircraft may shift along with it. If there is more than one failure, treat the excess rolls as those in *going somewhere* tests, reducing the aircraft's speed or pitch *(which may result in a level change).*

Aerobatic dice: Failure on an aerobatic die results in a one-point speed loss. This result has a maximum application of two - any additional failures on aerobatic dice (beyond two) are treated as failures on a movement die.

Bonus dice: Failures on bonus dice have no effect.

Penalty dice: Failure on a penalty die is treated as a failure on a movement die.

2.57 FOG OF MOVEMENT EFFECTS

Maneuvering aircraft that test to remain in their current hex are shifted to an adjacent hex if any doubles are rolled on the test. This does not include failure results or results on bonus dice. The number rolled on the matching dice determines the hex that the aircraft is shifted into (see 2.41).

Pilot points may be paid to cancel any of the matching dice (on a 1-for-1 basis) to eliminate this effect (but has no impact on the other effects of the cancelled die).

Any other aircraft that have a current spot on the shifted aircraft are shifted along with it.

2.60 STRESS TEST

Any aircraft attempting a level 3 or 4 MT, ending its move at a speed greater than their maximum dive speed, or suffering an MT failure stress result, must test for stress damage. This test takes place upon completion of the triggering MT (regardless of success) or at the end of the aircraft's move, and any effects are applied immediately. Roll 2d:

< 0 = destroyed, 0-1= fill current & next row of boxes, 2- 3 = fill current row of boxes, 4+ = none

modifiers: damage = -1 /filled row, speed = -1 /pt > max dive, MT4 = -3, aircraft strength = variable

2.70 STALL / SPIN TEST

Any aircraft that ends its move at a speed at or below its minimum speed (modified by MT level) must test to avoid stalling or spinning. This test takes place at the end of the aircraft's move and any effects are applied immediately. Roll 1d:

At min.speed: 1= spin, 2-3= stall, 4+= NE. At < min.speed: 1-3 = spin, 4-6 = stall.

Modifiers: Aircraft spin rating = variable, speed = -1 / point below minimum, flying skill = variable
Pilot points may be used to modify the roll at the cost of one point per ±1 modifier

2.71 STALLING

Stalled aircraft lose any spot they may have and may not spot or fire this turn.

The pitch of the model is set to a shallow dive (no speed is gained). If maneuvering, the status is changed to going somewhere (facing is determined randomly - no modification allowed).

2.72 SPINNING

Spinning aircraft lose any spot they may have and may not spot or fire this turn.

The model is marked as spinning and is pitched to a normal dive.

2.80 BROWNOUT TEST

Any pilot attempting a level 4 MT must test to resist succumbing to a brownout. The test takes place upon completion of the triggering MT (regardless of success) and its effects are applied immediately.

BROWNOUT TEST: Roll a number of dice equal to the sum of starting pilot points (less wounds) plus experience. A roll of a 6 is required on at least one die to pass. If failed, they lose any spot possessed and they may not spot or fire until recovered.

An aircraft with a pilot suffering brownout moves at its current speed and facing / pitch (determine randomly if currently maneuvering) and may not take any other action until recovered.

Recovery is done after movement and is accomplished by rolling a 6 as in the initial test. An additional die is added to the pool rolled for each successive turn attempting recovery. Upon recovery all actions (in the usual turn sequence) are allowed.

3. TARGETING PHASE

3.10 SPOTTING

A target (aircraft or ground) may be spotted / logged by each pilot or crew – this is optional, there is no requirement to spot / log a target. Only one target may be logged / held on a given turn. Once spotted, a target remains logged as such unless / until lost or is voluntarily relinquished.

3.11 LOSS OF TARGET

If at the end of movement a pilot's target is behind his aircraft the target is lost, and he must roll a spotting attempt to regain the target.

3.12 SPOTTING

To spot a target a number of dice are rolled. A roll of '6' is required on at least one die to succeed. The pool starts with two dice –additional dice may be bought with pilot / crew points (at a 1:1 cost). The number of dice is then modified by:

Pilot Experience: ± number of dice equal to rating
Aircraft Spot Rating: ± number of dice equal to rating
Aircraft MT level: subtract number of dice equal to current MT level
Target Position: behind = subtract 1 die, on tail = subtract 3 dice (ignore if rear crew)
Target Range: add 1 die if less than 5 hexes, subtract 1 die if 10-15 hexes, subtract 3 dice if greater than 15 hexes (add one hex to range for every two levels of altitude)

If a target is already held, attempting to spot a different target causes the existing target to be lost.

A CV is target specific --if/when a pilot / crew has logged a new target, its CV is reset to zero. Exception: When a pilot spots a new target that has an existing CV on his aircraft then his new CV is the negative of the target's CV.

3.13 MARKING

If a pilot has a target logged, the defensive value of movement on other aircraft that may be targeting him is decreased. For this reason, any aircraft whose pilot has a target logged should be marked / indicated as such. NOTE: A pilot that fails a spotting roll is considered to be devoting attention to the task of spotting and will suffer the same penalty to his defensive movement and should also be marked.

3.14 FRIENDLY TARGET – FORMATION FLYING

A friendly aircraft (not beyond one hex / level range and currently *going somewhere*) may be spotted / logged as a target – making it the targeting pilot's leader. If successfully acquired, the aircraft is moved at the same time (and in the same manner) as its leader. Any MTs or other performance checks (such as power rolls) must be made by each individual aircraft.

4. COMBAT PHASE

4.10 FIRING

Combat and any resulting damage is considered to be simultaneous.

4.11 VIABLE TARGETS

The firing aircraft (or crew) must hold a current spot on the target. If spotted this turn the attack is resolved as a snapshot.

If the firing aircraft is *going somewhere* the target must also be *going somewhere* and be either in the same hex and level as the firer, or –if in a different hex or level- the firing aircraft must be facing the target's hex and/or level.

If the firing aircraft is *maneuvering* the target must be in the same hex and level.

4.12 FIRING PROCEDURE

The attacking player determines the number of dice to be rolled, and then rolls for hits. A hit is scored for each '6' rolled. The target player then rolls for damage and applies the effect(s).

ATTACK DICE: The attacker chooses a number from zero to the current CV* (reducing the current CV by same -maximum of 5). This number may be increased by using PP at a ratio based on shooting skill: dismal = n/a, poor = 4:1, average = 2:1, good = 1:1, great = 1:2 (skill = PP:dice). The result is then multiplied by the gun rating.

*For a snapshot, the CV is the result of subtracting the target's initiative from the firer's initiative.

This product is then modified (in order) by range, deflection, and burst size:

Range - one hex or 2 levels = ½ dice, > one hex or 2 levels = no attack (subtract 1 level if above)
Deflection – halve dice for each facing/pitch difference (except opposites)
Burst Size*– one = ½ dice, two = all dice, three = +½ dice, four = 2x dice (*snapshot* = size one)
* burst size = the maximum is the lesser allowed by MT-level sum:
0 = size four burst, 1 = size three burst, 2 = size two burst, 3-4 = size one burst, 5+ = no shot

All modifications of the dice pool are cumulative, and all fractions are rounded down.

4.13 HEAD-TO-HEAD SHOTS

In cases where aircraft have a positive CV on each other, firing is considered to occur in a head-on situation. The current CV available for each is modified by the combined speed of the two aircraft: If sum is between 10 and 15 multiply CVs by one half, and if greater than 15 multiply by one quarter. All targets and CV are lost for both aircraft.

4.15 JAMMING

An aircraft must check for jamming on each gun firing a size two, three, or four burst.
Roll dice equal to the size of the burst: A result of two 1s indicates the gun is jammed.

4.16 AMMUNITION

Mark off a number of boxes equal to the burst size used. No gun may fire a burst size greater than the current number of ammunition boxes held.

4.10 FIRING (cont'd)

4.17 CREW-SERVED WEAPONS

ARC-OF-FIRE: Flexible-mount guns allow fire into more than one adjacent hex. The specifics would have to be determined for each aircraft individually, but generally:

If the target is at the same level, front-mounted guns can fire into the front three hexes, and rear-mounted guns can fire into the three rear hexes. If the target is in a higher level, all flexible-mount guns can fire into all six adjacent hexes.

CV BONUS: The base CV of an observer is the same as the gun rating and is marked / tracked once a successful spot is made. Observers may not adjust their CV through any actions of their own. Pilots of the observer's aircraft may adjust the observer's CV during the aircraft's move:

If the pilot has targeted the same enemy, additions are made while at an MT level of 0 (no MT dice rolled) and using Pilot Points to buy dice (on a one-for-one basis) and rolling those to gain a CV bonus for the observer – the gain is the same as taking an MT. Subtractions are made by taking an MT: any CV bonus gained for the pilot / aircraft are subtracted from the observer's CV.

If the pilot has not targeted the same enemy, subtractions are made by taking an MT: ½ of any CV bonus gained for the pilot / aircraft is subtracted from the observer's CV.

Pilots of enemy aircraft may adjust the observer's CV during their moves:

If the aircraft has targeted the observer's aircraft, subtractions are made by taking an MT and using all or some of the CV bonus gained to reduce the observer's CV. Any CV bonus used in this fashion may not be used to add to the target aircraft's own CV. If this adjustment reduces the observer's CV to zero or less, the observer loses his spot and may not fire.

If the aircraft has not targeted the observer's aircraft, subtractions that result from any MT made by it are made fractionally in the same manner as the normal CV penalty (2.65).

4.20 DAMAGE

The target player rolls 1d for each hit: a result of 1-5 indicates the number of damage boxes to be marked off on the target's log (4.21), and a result of 6 indicates a critical hit (4.22).

NOTE: Before rolling for damage, the firer may use hits to buy a critical hit. The cost depends on the firing skill: dismal = 6 hits, bad (or flexible gun) = 5 hits, average = 4 hits, good = 3 hits, great = 2 hits

All damage from non-critical hits should be applied prior to rolling for the effect of critical hits.

4.21 DAMAGE BOXES

Mark each box with a single, diagonal slash – when the top row is filled move to the next until all rows are filled, then return to the top row and mark with a second slash (creating an 'X').

When a row is filled the aircraft suffers the Pilot Point and MT penalty (if any) indicated on the Log (any excess Pilot Point penalty results in additional MT penalty).

The maximum dive speed is reduced by 1 for every two rows filled, and the MT-level trigger for the Stress Test (initially MT 3) is reduced by 1 for every four rows filled.

4.22 CRITICAL HITS (roll 2d)

2 = aircraft destroyed
3 = engine destroyed, -1 speed each turn
4 = fuel hit, make fire roll at +1 each turn
5 = engine hit, roll drag each turn at -1 *
6 = engine hit, roll drag each turn *
7 = structural damage (mark current and next rows)
8 = control damage, +2 penalty dice to MTs
9 = control damage, +4 penalty dice to MTs
10 = pilot wounded, -½ pilot points
11 = pilot wounded, -all pilot points
12 = pilot killed

* any future power rolls made are done at a -1 penalty

Smoke: For any engine or fuel results roll 1d. A result of 4+ = smoking. Subtract 2 Pilot Points.
Fire: If aircraft smoking (or if fuel hit) roll 1d. A result of 6+ = fire. Subtract 2 more Pilot Points.

4.24 SPREADING FIRE

If an aircraft has been on fire for the entire turn, roll 1d and fill the number of damage boxes equal to the roll, beginning with the bottom row. Fire damage fills –rather than marks- damage boxes. Boxes that have been filled are not eligible to be marked in later turns – any marks that would normally be made in a filled box are made in the next row.

A1. AIRCRAFT / PILOT RATINGS

K.I.S.S. Ratings have been reduced to a basic Likert scale and are very mechanical. Accidental historical accuracy is welcomed, but not implied / intended. Playtesting (if any) will certainly modify these figures. The bottom line question is, IMO: Do the modifiers affect player decisions in a manner that creates game-critical choices so that they affect the outcome in a satisfying way?

A2.10 PILOT / CREW RATINGS

EXPERIENCE Ability to assess a situation and/or formulate a plan of action, indicated by a modifier to the spotting and initiative rolls: -2 = dismal, -1 = bad, 0 = average, +1 = good, and +2 = great.

FLYING Skill in handling the aircraft, indicated by a modifier* to Movement Test rolls:
-2 = dismal, -1 = bad, 0 = average, +1 = good, and +2 = great.

* negative modifiers add penalty dice, positive modifiers add bonus dice

Also: special bonus(es) may be given regarding use of PP to modify MTs and/or stall/spin tests.

SHOOTING Skill in firing at a target, indicated by the multiplier applied to Pilot/Crew Points added to attack dice: 0 = dismal, .25 = poor, .5 = average, 1 = good, 2 = great

as well as by the number of hits required for a 'Hits for Crits' trade:
6 = dismal, 5 = bad, 4 = average, 3 = good, and 2 = great

PILOT (or CREW) POINTS (PP/CP) Time / attention available for tasks based on experience / ability, indicated by an amount allocated on each turn: 0-1 = dismal, 2-3 = bad, 4-5 = average/okay, 6-7 = good/very good, and 8+ = great.

PILOT (or CREW) MORALE Measure of eagerness regarding danger and/or risk, indicated by a modifier* to morale tests and/or willingness to obey commands: -2 = dismal, -1 = poor, 0 = average, +1 = good, +2 = great.

* modifier may be in the form of addition/subtraction to either a roll or the number of dice rolled

A2.20 AIRCRAFT RATINGS

SPOT Number of degrees obscured by wings in profile view, indicated by a modifier to the spotting roll: -3 = 180+, -2 = 150-180, -1 = 12-150, 0 = 90-120, +1 = <90

POWER { [(25 / (power loading/efficiency)) – 1] / .5 } -1, indicated as modifier to power roll.

DRAG Drag Coef x Area / 3000, indicated by modifier to drag roll: -1 = <1.24, +1 = >1.75, +2 = >2.5

CLIMB Modifier to MP roll based on fpm: <150 = -4, -300 = -3, -450 = -2, -600 = -1, -750 = 0, -900 = +1, -1050 = +2, -1200 = +3, -1350 = +4, -1500 = +5, -1650 = +6, -1800 = +7, -1950 = +8

SPEED Based on mph: <34 = 0, -46 = 1, -57 = 2, -68 = 3, -80 = 4, -91 = 5, -102 = 6, -114 = 7, -125 = 8, -136 = 9, -148 = 10, -159 = 11, -170 = 12, -182 = 13, -193 = 14, -204 = 15, -216 = 16, ...

MT BONUS Flying character of the design, indicated by a modifier to MT rolls (in the form of bonus or penalty dice) as well as penalties assessed to MT rolls and Pilot Points in the filling of damage rows.

The numbers shown in the chart below indicate the modifiers to MT rolls and number of Pilot Points lost if that row is filled. (NOTE: Effect is -1 for each when rows are filled for the second time.)

RATING:	DISMAL	POOR	AVERAGE	GOOD	GREAT
START:	MT -2, PP 0	MT -1, PP 0	MT 0, PP 0	MT +1, PP 0	MT +2, PP 0
ROW 1:	MT -3, PP 2	MT -2, PP 1	MT -1, PP 0	MT 0, PP 0	MT +1, PP 0
ROW 2:	MT -4, PP 3	MT -3, PP 2	MT -1, PP 1	MT -1, PP 0	MT 0, PP 0
ROW 3:	MT -5, PP 4	MT -4, PP 3	MT -2, PP 2	MT -1, PP 1	MT -1, PP 0
ROW 4:	MT -6, PP 5	MT -5, PP 4	MT -3, PP 3	MT -2, PP 2	MT -1, PP 1

AEROBATICS Agility of the design, indicated by a modifier to the number of aerobatic points that may be added to an MT: -2 = dismal, -1 = bad, 0 = average, +1 = good, and +2 = great.

SPIN Gentleness of stall and recovery characteristics of the design, indicated by a modifier to the stall / spin check: -2 = dismal, -1 = bad, 0 = average, +1 = good, +2 = great.

GUN Number of rounds fired, indicated by a multiplier of the CV in an attack:
1.0 = any single Vickers/Spandau or Hotchkiss with mechanical interrupter system (~450rpm)
1.5 = any single gun with a CC interrupter system or one without an interrupter system (~700rpm)

NOTE: Modifiers are summed, so that, for example, two mechanical interrupter guns have a 2 rating.

AMMO Seconds of fire indicated by number of size-one bursts: Lewis = 4 or 8, Parabellum = 20, Belt = variable – generally 20 to 30.

STRENGTH Structural sturdiness of the design, indicated by the number of damage boxes in rows on the log (6 = dismal, 7 = bad, 8 = average, 9 = good, and 10 = great) as well as a modifier to the roll for stress tests (-2 for dismal, -1 for bad, 0 for average, +1 for good, +2 for great).

A2.0 OPTIONAL RULES

TRANSFERING OFFENSIVE CV GAINS

In addition to the usual application of CV gains where the points are applied to both a testing pilot's CV tally and a targeting pilot or crew's CV tally, testing pilots may also pay PP to transfer some of the CV points gained in a test to use them defensively against an untargeted aircraft. Doing this would be *in place of* applying those points offensively (i.e.- a CV point transfered in this manner may not also be added to one's own tally). If more than half of the adjusted CV points gained in a test are transfered in this manner the pilot's current spot is lost.

The PP cost of transfering CV points in this manner is based on a pilot's experience:

Pilot Experience	PP Cost	CV Points Transfered
-2	3	1
-1	2	1
0	1	1
+1	1	2
+2	1	3

VOLUNTARY LOSS OF TARGET

SPOTTING

ANNOYANCE SHOTS

Mark each aircraft that has taken hits from an untargeted enemy with the number of hits - This number will be used to trigger and modify a morale check made next turn.

RIFLE FIRE

The base number of attack dice is equal to half the sum of allocated CV and observer points. The modifications for range, deflection, and shot type are as above. The modification for burst size is: one = no shot, two = ½ dice, three = all dice, four = +½ dice. A hit requires two 6s to be rolled.

Only one hit may be scored in a rifle attack. The effect is determined by rolling on the critical hit table – results of 2, 7, 8, and 9 are ignored.

REMAINING IN FIGHT AFTER LOSS OF PILOT POINTS

A3.0 TIPS TO SPEED PLAY

A3.1 ROLLING FOR MOVEMENT TESTS

A player may choose to not roll for an MT if the pilot has sufficient Pilot Points to cancel any possible number of failures. Procedure:

- Pay PP equal to the number of dice that would be rolled (including penalty dice).
- Gain minimum CV allowed for a successful test – may match with PP (if available).

The aircraft is still considered to be at the appropriate MT level and should be marked as such.
All power / speed costs must be paid, as well as any penalties incurred for initiative, spotting, etc...

AIRCRAFT _____ SPOT ____ GUN ____

MOVE ____ AERO ____ SPIN ____ PWR ____ DRAG ____ CLIMB ____

MIN at MT0 ____ MT1 ____ MT2 ____ MT3 ____ MT4 ____ MAX ____ DIVE ____

ID # _____ PILOT POINTS ☐☐☐☐☐☐☐☐ EXP _____

TARGET _____

DAMAGE ☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____

☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____ DIVE ____

☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____

☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____ DIVE ____

NOTES: _____

ID # _____ PILOT POINTS ☐☐☐☐☐☐☐☐ EXP _____

TARGET _____

DAMAGE ☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____

☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____ DIVE ____

☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____

☐☐☐☐☐☐☐☐☐☐ PP ____ MT ____ DIVE ____

NOTES: _____

AIRCRAFT *Imaginary Generic Fighter* SPOT *0* GUN *1*

MOVE *0* AERO *0* SPIN *0* PWR *0* DRAG *0* CLIMB *0*

MIN* at MT0 *1* MT1 *1* MT2 *2* MT3 *4* MT4 *6* MAX *7* DIVE *10*

ID # _____ PILOT POINTS ☐☐☐■■■■■ EXP *0*

TARGET _____

DAMAGE ☐☐☐☐☐☐☐☐■■ PP *n/e* MT *1* **

☐☐☐☐☐☐☐☐■■ PP *-1* MT *1* DIVE *9 (7)*

☐☐☐☐☐☐☐☐■■ PP *-2* MT *2*

☐☐☐☐☐☐☐☐■■ PP *-3* MT *3* DIVE *8 (6)*

NOTES: _____

ID # _____ PILOT POINTS ☐☐☐■■■■■ EXP *0*

TARGET _____

DAMAGE ☐☐☐☐☐☐☐☐■■ PP *0* MT *1*

☐☐☐☐☐☐☐☐■■ PP *-1* MT *1* DIVE *9 (7)*

☐☐☐☐☐☐☐☐■■ PP *-2* MT *2*

☐☐☐☐☐☐☐☐■■ PP *-3* MT *3* DIVE *8 (6)*

NOTES: _____

* *These are minimum speeds when at noted MT level*

***These numbers show current (not cumulative) modifiers when damage row is filled for first time.*
PP = Pilot Point loss and MT = penalty dice on MTs (= one each when filled second time with 'X')

REFERENCE SHEET

What follows can be copy-pasted onto an 11" x 14" format (no margins)
and then printed 2-pages-per-sheet on a standard 8½" x 11" sheet of paper.
The resulting side-by-side pages can then be cut into two 5½" x 8½" sheets.

1. HOUSEKEEPING

- PP/CP restoration, Morale, Initiative (±Exp, - MT lvl), Collision, CV adjustment

2. MOVEMENT

Order: 1) spin, fire, reload/unjam, failed morale 2) targeting 3) non-targeting

MOVEMENT POINTS 1d+spd: < 4 = **0**, 4-9 = **1**, 10-15 = **2**, 16-21 = **3**

- Climb / Dive: Horizontal MP = -3 to roll if normal, -6 if steep
  Vertical MP = -6 to roll if shallow, -3 if normal (± climb modifier)
- Maneuver: -2 to roll if maneuvering
- Pilot Points / CV: ±1 to roll for every 2 points spent / possessed

SPEED CHANGE

- Power/Drag: 1d >2 = ±1, >6 = -2 (Drag only: player choice)
  Power: +1 if at min.speed and MT0, -1 if at one less than max.speed
  Drag: subtract pitch level from roll if diving
- Dive / Climb: ± final pitch level if entire turn (pitch level-1 if changed this turn)

MT TABLE

Cross-reference speed and task to find the MT level required

task \ speed	<3	3	4	5	6	7	8	9	10-11	12-14	15-17	18+
60°, 2 steps*	**P**	**0**	**1**	**1**	**1**	**2**	**2**	**2**	**3**	**3**	**4**	**X**
120°, 3 steps*	**P**	**1**	**1**	**1**	**2**	**2**	**2**	**3**	**3**	**4**	**X**	**X**

180°, 4 steps*	**0**	**1**	**1**	**2**	**2**	**3**	**3**	**3**	**4**	**X**	**X**	**X**

* for pitching up only: roll single Penalty die if pitch-down change >3 steps

- 1-step changes infer row above 2-step (and below 4-step for >4 steps)

- reduce MT level shown by one for pitch changes made from level or climbing status

- may shift up one row if facing change made while climbing or diving (normal or steep pitch)

Maneuvering Tests use the bottom row of the table:

- may choose higher than indicated MT level (unless moving to new level or hex)

- *must use* one less than indicated MT level if moving a hex

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MT LEVEL

lvl	move	aero	bonus	failure	spd*
0	0	1	6s	2x **1**s	NE
1	1	2	6s	**1**s	p -1
2	2	3	5s & 6s	**1**s	-1
3	3	1	**4**s,**5**s,& **6**s	**1**s & **2**s	-3
4	4	0	**4**s,**5**s,& **6**s	**1**s,**2**s,& **3**s	-6

Gain 1 CV per move die rolled

Gain 1 CV per two aero dice rolled

Pay PP to match CV gains (1:1)

Pay PP to cancel fail rolls (1:1)

Halve CV gain for facing / pitch MT or
if maneuvering range to target = 1

Opponents reduce CV (by ½ if active aircraft has no or different target)

* lose 1 point of speed for every two aero dice rolled

MT FAILURE

MOVE: -1 facing / pitch attempt per failure, or move to adjacent hex if maneuvering.
(excess failures reduce speed and/or pitch - max.speed loss = 2)

CV: Reduce current CV by half for each failure rolled

STRESS: Roll & sum 1d / failure, divide by 5: test if ≥1 (-1 to test for each point >1)

STRESS TEST (2d) If end turn above max.dive speed and/or attempt level 3 or 4 MT

< 0 = destroyed, 0-1= fill current & next row, 2- 3 = fill current row, 4+ = NE

modifiers: MT4 = -3, damage = -1 / filled row, speed = -1 / pt > max dive, aircraft strength

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STALL / SPIN CHECK (1d ± flying, -1 /speed < min, ± PP)

@ min.spd: 1 = spin, 2-3 = stall, 4+ = NE. < min.spd: 1-3 = spin, 4-6 = stall

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3. TARGETING

- Spotting: Roll 2d, '6' = success. Pay PP/CP for more dice

Modifiers: ± spot rating, ± exp, - MT level, -1 behind, -3 tail. Range +1<5, -1 10-15, -3 >15

- If existing target is behind (areas 4, 5, 6) it is lost and pilot must roll spot to regain.

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4. COMBAT (simultaneous - must face target if not maneuvering)

- Base number of dice = CV* x Gun rating (CV for Snapshot = diff in initiatives)

* pay PP to add CV based on **shoot skill** (PP /1pt CV): **-2** = 5, **-1** = 4, 0 = 3, **+1** = 2, **+2** = 1

- Modify # of dice (in order) by: Range (½ if 1), Deflection (½ if facing diff 2+), and

Burst Size*: 1 = x½, 2 = x1, 3 = x1½, 4= x2 (Snapshot burst size = 1)

*by **MT-level sum: 0** = size 4, **1** = size 3, **2** = size 2, **3-4** = size 1, **5+** = no shot

HITS scored on 6s. Roll for each: 1-5 = damage boxes, 6 = critical hit

Hits for Crits. dismal = 6, poor (or flexible) = 5, average = 4, good = 3, great = 2

CRITICAL HITS (2d6)

2 = aircraft destroyed

3 = engine destroyed[1], -1 speed each turn

4 = engine[1], roll drag each turn

5 = fuel[1], as #3, or as #4 *and* as smoking +2

6 = engine[2], as #3 if roll 1-3 on power roll

7 = structural damage (fill current+next rows)

8 = control damage, +2 penalty dice to MTs

9 = control damage, +4 penalty dice to MTs

10 = pilot wounded, -½ pilot points

11 = pilot wounded, - all pilot points

12 = pilot killed

[1] roll 1d: 4-6 = smoke, -2 PP. If smoke, roll 1d each move: 6 = fire, -2 more PP

[2] ignore result if aircooled engine

JAMMING : roll #d (# = shot size). Jam if two ones rolled - may cancel with PP