AERIAL CRAPS

Bucket o' Dice version

Rules for gaming WW1 aircombat with miniatures

0. INTRODUCTION / DESIGN

0.0 INTRODUCTION

These rules are being made available to the general public in order to gain feedback from as great a pool of people as possible —either from reading or playtesting. They are most definately *not* a finished product...not even close. Rather than infant, they would be better described as larval. This means that finding discrepencies or errors or omissions is not to be regarded as "big news"...and don't even think about trying to count the typos! Also: the numbers in the game (modifiers, ratings, etc...) 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 said 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 actually 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 —at either game design or WW1 aircombat—so fire away and have no concern for my "delIcate sensibilities".

You may email me directly: brawlfactory@yahoo.com

or post on the discussion forum on the Miniature Wargaming site:
http://www.miniaturewargaming.com/index.php/forums/viewthread/1403/

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, as well as (and perhaps more importantly) provide a game system accessible to the casual gamer (such as at a convention or gameday) that doesn't present a steep learning curve (either of time-motion or game mechanics) so that trying out the genre is easier and more accessible: Swordfighting 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 (ie: having fun with) the genre.

0.10 DESIGN

0.11 GENERAL
These rules aim to present gamers with a touch of the uncertainty, risk, and/or fear associated with sitting at the controls of a fragile, flammable collection of sticks and cloth a mile or more above the trenches while someone in a similar contraption tries to put bullet holes in you. The calm, predictable movement of chess pieces is the antithesis of the odds-driven risk of a game of craps that lies at the heart of this design. This game has a mood-based objective that tries to put players in the <u>heads</u> of their warrior alter-egos: concerned with and deciding *what* to do, rather than in the <u>bodies</u> concerned with and deciding *how* to do it.

Instead of choosing which specific move / maneuver to use to position one's aircraft model on the tabletop (as is common in most –all?- 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 (attack, movement, observation, etc...) is determined by dice rolls that are influenced by pilot / aircraft quality and the level of risk chosen.

The level of control held by players (and the degree of detail of the action displayed on the tabletop) is significantly less than that found in the dominant, traditional, flight-sim games common to the genre in which a player's chief (if not only) concern / input involves the movement and positioning of the aircraft model 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 the "heat of battle" of close-in 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 (ie: flying) of the aircraft. I believe that pilots don't think about flying — anymoreso than martial artists think about hand / arm positioning or footwork. I therefore believe that players —who are gaming as pilots—shouldn't think much about flying either.

I realize the oddity of this premise (which is, in a sense: Flying isn't a required facet of aircombat) and have received quite a few doses of vitriol from aircombat devotees who bristle at the very thought of suggesting that they let go of the control stick. I only ask that a deep breath be taken, the premise accepted that the little fellow in the model (not the player) is piloting 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 "I'll do a wingover to line that guy up" or "maneuver 27 should allow me to escape" – which relate to the specific movement and positioning (ie: flying) of the aircraft.

I think they're more along the lines of "I want to shoot at that guy" or "I may break the plane but I'm going to pull HARD!" 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, IMO, to game the genre.

DESIGN (cont'd)

0.12 MOVEMENT
General movement on the table is hex-based, and is handled as with similar miniatures games (with the addition of a randomization factor described in "MOVEMENT TESTS"). The hexes (and altitude levels) used, however, represent large areas (approximately 500' across –meant to be interpreted as combat / engagement range) within which any number of aircraft can exist. The larger-scale hexes make the position / display of the models on the table more abstract than in other games: There is no representation made of an aircraft's specific position, and aircraft 'maneuvering' in a hex (as opposed to 'going somewhere') have no facing. Also, models do not display any particular flight attitude: the banking / pitching shown (if any) simply indicate the level of maneuver difficulty undertaken / vertical facing (respectively) of the aircraft. It is best for players to view the models as representative playing pieces (much as one would treat a miniature in another genre –a tank model or infantry figure, for example) rather than as displaying an exact configuration / position.

0.121 FOG OF MOVEMENT
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. However: total chaos and unpredictability is not the objective. 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 (such as tighter turns), poor pilot skill (either basic or modified by wounds), and/or aircraft quality (as with pilot skill: either basic or resulting from 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 feature is to communicate to players the 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 in a fluid arena where everything —themselves, their opponents and allies, and the terrain itself—is moving. Risk and uncertainty yielding peril and opportunity: that is the mood that these rules attempt to create for players.

0.122 MOVEMENT TESTS
The mechanism used to inject Fog of Movement into the game is the Movement Test (MT). Changes in facing (horizontal or vertical) as well as the abstract maneuvering done within a hex may require a dice roll to determine success based upon the difficulty of the movement chosen: these rolls are called Movement Tests. A more difficult movement chosen (ie: a riskier dice roll) results in a greater gain for success as well as a higher penalty for failure.

MTs have a numerical level: 0, 1, 2, or 3 = easy to hard — which can be roughly translated as: 0 = training school, 1 = basic flying, 2 = combat maneuvering, 3 = pulling the wings off.

The MT level affects target acquisition, signaling, collision, orientation, and firing (both by and against) —generally, the more difficult / violent the current movement done, the harder it is to do other things.

Pilot skill can be used to improve the benefits of a test or to cancel the effects of a failure.

DESIGN (cont'd)

0.13 COMBAT

Firing and damage is handled similarly to 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 aircraft), and possible jamming. An oddity of the rules is that an aircraft 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 (in the face of other enemy aircraft) or a lucky shot.

The main difference in how combat is treated relates to the physical positioning of the models on the tabletop during the course of play. The lack of display (and player input) regarding specific maneuvering / movement has a direct impact on how combat is handled. Firing opportunities are determined not by model position (which, since specific movements are not shown, is not representative of an aircraft's place in the sky), but are instead represented by an abstract, numerical game-mechanic of relative combat-values. There is still player input in regard to firing opportunities and/or evasion attempts to get out of an enemy's line-of-fire, but it is handled by dice rolls and numbers instead of the physical positioning of the models on the tabletop.

Thus in this game, players wishing to fire upon an enemy must —instead of choosing and executing movements to point their model at the intended target model—succeed in abstract Movement Tests that will gain them a numerical advantage over their opponent. Exactly how the shot is lined up is left to the little fellow in the model (and the player's imagination) —just as with other games in other genres, the details of the close-in fighting are not determined / displayed: only the results of the round of combat are resolved. I readily concede that rolling dice is not nearly as dramatic visually 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 other skirmish-level, ground combat systems).

0.131 COMBAT VALUE

Like the Movement Test, the Combat Value is a notably different concept that deserves elaboration.

Most every other aircombat game has players involved in physically positioning their models in order to determine firing possibilities. This game differs markedly in that whether a shot is possible or not is dictated by the presence of a Combat Value advantage held by the firing aircraft over its target.

The Combat Value is an abstract, numerical description of the firing position held by an aircraft on another. The size of the advantage reflects the quality of the position based on the variables of range and deflection: a low number can be viewed as at extreme range and/or large deflection, while a higher value can be thought of as point-blank range on a target's tail.

Besides its primary use in determining firing effects, the Combat Value is also used to modify movement order (to improve tailing odds) as well as movement distance (to allow a pursuing aircraft to maintain contact on a target).

DESIGN (cont'd)

0.14 PIECES-PARTS

0.141 GAMING AREA

The gaming surface should be divided into hexes which represent engagement / combat zones that represent areas approximately 500' across. The size of the hexes is determined by the miniatures used: they should be large enough to allow at least four to six models to occupy a single hex — though larger is better. Obviously, table size (and reach of the players) will restrict the hex size. To allow for a reasonable amount of maneuver space, it is recommended that a minimum of a 6 x 6 – hex area be available for most games –though greater space would be needed for a larger engagement, and "bigger is better" is a good rule-of-thumb to apply, especially in a genre where the combat arena is airspace! An "open sea" convention (shifting all the pieces an equal number of spaces) can easily be used to expand the playing area should the action move close to the edge of the table. Also: a separate hexboard (either blank or from an existing game such as AH's "Richthofen's War") can be used with counters to move units / aircraft in the initial stages of an encounter until they close to within table-distance.

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 no matter the scale of models used. This playing convention –used in conjunction with counters / figures to show the movement / position of flights of two or more aircraft on a smaller-scale, master-movement board—should allow players to game with these rules no matter the scale / size of miniatures available on any reasonable-sized gaming table.

Relevant terrain that should be shown on the table would include trench lines (which would affect pilot survival in a forced landing as well as possible ground fire) and bombing / observation targets (airfields, supply depots, roads, etc...) –these could / should be indicated with moveable / temporary pieces to allow for different scenarios as well as the shifting required in using the "open sea" convention noted above. Clouds (an important part of the "hide-and-seek" or just plain "hide" aspect of the genre) can be shown with either markers on the table surface indicating height / thickness in certain hexes, or with a more physical representation involving cotton or some such material on a stand (similar to those used for the aircraft) displaying the extent of the coverage. No matter the means of representation: terrain / clouds should in no way impair / interfere with the practical / efficient movement of the aircraft models on the playing surface.

The altitude of each aircraft needs to be shown (in 500' increments) with a provision for indicating whether the aircraft is in the level or leaving it, either with telescoping / multiple-section stands or counter / chit indicators. While possible, it is not recommended to have players keep track of their altitude in a log: every effort should be made to make the information available in plain view to the other players. As with the horizontal space / hexes: an "open sea" playing convention can be used to shift play / miniatures to a common altitude range –there is no reason to restrict changes in altitude to any more of a constraint than horizontal movement –until, of course, you bump up against terra firma...

DESIGN (cont'd)

0.142 MINIATURES
Models represent individual aircraft.

The size of models used is up to the players, but since base size is tied closely to this and directly affects the hex size and resultant table space available, smaller is definitely better. 1/72 models -- while common-- are, to put it bluntly, almost too large, and further cost / assembly disadvantages far outweigh any possible selection advantage. If entering the genre, the recommended choice is currently between three scales: 1/144, 1/300(1/285), and 1/600. The factors of cost, assembly / painting, and inventory selection pretty much align with the range: the bigger the model = the higher for all three.

No matter the scale chosen, each model will have to be mounted in such a manner as to display both bank and pitch (up as well as down):
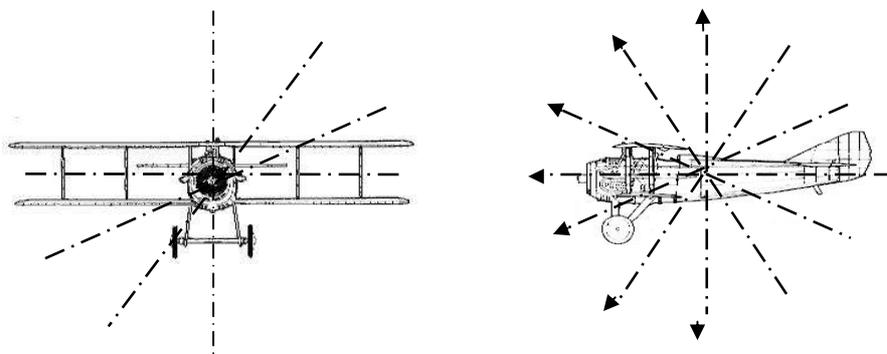
There seem to be as many means of accomplishing this as there are gamers --methods range from magnets to alligator clips to flexible straws...it matters not: as long as the model can be positioned to indicate distinct positions of both bank and up- / down- pitch.

An option to physically moving the models would be to use chits / markers to display the state of a model's pitch and/or bank status –so long as all the players can see the current status.

The speed for each aircraft should also be displayed by some means: some sort of dial or scale or chits that will allow any player to easily see how fast an aircraft is going.

In sum: the facing, altitude, speed, bank, and pitch of all aircraft 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 more "public" means of displaying the information on the gaming table.

In addition to the game information and statistics displayed, each aircraft / stand should have a number or other identifier to make targeting and aircraft-specific referrals easier during play.

DESIGN (cont'd)

0.143 PILOT RATINGS

EXPERIENCE
This rating reflects the ability to assess a situation and to formulate a plan of action, and is indicated by a modifier to the initiative roll: -2 = dismal, -1 = bad, 0 = average, +1 = good, and +2 = great.

FLYING
This rating reflects skill in handling the aircraft, and is indicated by a modifier to the dice pool of MTs: +2 = dismal, +1 = bad, 0 = average, 1 = good, and 2 = great. Dismal / bad skills add dice to the number required, while good / great skills treat a number of MT dice as if bought with Pilot Points.

SHOOTING
Skill in aiming / firing at a target, indicated by a modifier to the number of hits required for a 'Hits for Crits' trade: 6 = dismal, 5 = bad, 4 - average, 3 = good, and 2 = great.

PILOT POINTS
These represent available attention / energy based on experience / ability, and are indicated by an amount available on each turn: 1 or 2 = bad, 3 or 4 = average, 5 or 6 = good, and 7 or 8 = great.

0.144 AIRCRAFT RATINGS

STRENGTH
This represents structural sturdiness of the design, and is indicated by the number of damage boxes: 8-6-6-4 (26) = bad, 9-7-7-5 (30) = average, and 10-10-8-6 (34) = good.

MT BONUS
This represents the handiness / quality of flying character of the design, and is indicated by a modifier to the number of dice required for an MT, as well as the number of penalties assessed to Pilot Points and MTs in the filling of damage rows. For Pilot Points, 4 of 4 (1 each) is dismal, 3 of 4 (1,1,0,1) is bad, 2 of 4 (0,1,0,1) is average, 1 of 4 (0,0,1,0) is good, and 0 of 4 rows is great. For MT penalties, 6 in 4 (1,2,1,2) is dismal, 5 in 4 (1,1,1,2) is bad, 4 in 4 (0,1,1,2) is average, 3 in 4 (0,1,1,1) is good, and 2 dice in 4 rows (0,1,0,1) is great.

AEROBATICS
Nimbleness / agility of the design which is indicated by the modifier to the number of dice that can be added to an MT using aerobatics: -2 is dismal, -1 is bad, 0 is average, +1 is good, and +2 is great.

SPIN
Gentleness of stall and recovery characteristics of the design which is indicated by the modifier to the stall / spin check: -1 is bad, 0 is average, and +1 is good.

GUN
Number of rounds per minute fired, indicated by the multiplier of CV: .5 for any single vickers/spandau or hotchkiss with mechanical interrupter system, 1.0 for any single lewis or vickers/spandau without an interrupter system or two vickers/spandau with mechanical interrupter system, and 1.5 for any two vickers with CC interrupter system.

The bottom line in using any rating or modifier in the game is this: as long as all players involved agree on using a particular number, then it's okay.

1. HOUSEKEEPING PHASE

1.10 PILOT POINTS
At the start of the turn, each aircraft's allotment of Pilot Points is reset to its starting amount. The amount is reduced by any wounds and/or damage received to that point.

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

1.21 LOSS OF TARGET
If, at the beginning of a turn, a logged target is behind an aircraft (2.41) the target may be lost. Roll 1d (subtract one if target is on the tail of the aircraft – 2.41): A result less than five means the loss of the target. Pilot Points may be paid to gain a bonus to the roll (+1 for each Point spent).

If the target is lost, the aircraft must roll a spotting attempt to regain the target.

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

1.22 SPOTTING
To spot a target, roll 1d: a score of 4 or better is required to succeed.

Modifiers to the spotting roll:

Spotting Aircraft status: add/subtract spot rating, subtract MT level #
Target Position: on tail (2.41) = subtract 3, up sun = subtract 4
Target Range: subtract 1 for every two hexes beyond one (round down)
    (add one hex to range for every two levels of altitude difference)
Pilot Points: Add 1 to roll for each Point spent

1.23 MARKING
If an aircraft has a target logged, the defensive value of its movement on other aircraft that may be targeting it is decreased (2.65). For this reason, any aircraft that has a target logged should be marked / indicated as such. NOTE: An aircraft that fails a spotting roll is considered to be devoting attention to the task of spotting and will suffer the same penalty to its defensive movement and should also be marked.

1.24 FRIENDLY TARGET – FORMATION FLYING
A friendly aircraft (not beyond one hex / level range and moving in the same direction) may be spotted / logged as a target – making it the targeting aircraft'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.

1.30 COMBAT VALUE (CV) ADJUSTMENT

Aircraft that have logged a target will track CV bonuses / penalties during the course of the coming turn: these additions / subtractions will result from carryover, position, and movement.
The adjustments for carryover and position are handled in this step (in that order).

An aircraft's CV is target specific --if/when an aircraft logs a new target, its CV is reset to zero. Exception: When a new target is chosen that has an existing CV bonus on the aircraft then the aircraft's new CV is the negative of the target's CV and need not be tracked separately.

1.31 CARRYOVER

If the same target is kept from the previous turn an aircraft may retain some or all of its existing CV.

The existing CV (if positive) is:

- reduced to zero if the target is behind the aircraft (2.41)
- reduced to zero if the range to the target is beyond 2 hexes

1.32 POSITION

This is based on the relative position of an aircraft to its target (denoted by the aircraft in the diagram)*. The numbered hexes indicate the bonus gained by the targeting aircraft if it occupies that hex. The facing and/or maneuvering status of the targeting aircraft has no effect on the position bonus. Aircraft that are targeting each other should apply their respective bonuses based on their relative positions.
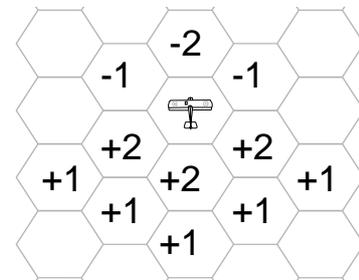
* NOTE: Aircraft maneuvering in a hex have no facing,
  and therefore no "behind". No position bonus may be gained
  if targeting such an aircraft.

SAME-HEX POSITION BONUS: If the targeting aircraft is both maneuvering and in the same hex as the target aircraft (which is not maneuvering) it gains a +3 position bonus to its CV.

1.40 INITIATIVE

Each aircraft rolls one die and modifies it by the pilot experience.

1.41 CV ADJUSTMENT (TAILING)

If an aircraft's target has declared a target of its own, the targeting aircraft's CV may be added to its initiative roll; if the aircraft's target has no target of its own, then only half of the targeting aircraft's CV (rounded up) may be added to its initiative roll. If the adjusted initiative is greater than that of the target's, then the aircraft moves immediately after its target. NOTE: No CV bonus of the target on another is used in the comparison. The tailing aircraft need only exceed the normal, posted initiative (die roll modified by experience) of its target.

This rule may create "chains" of tailing in which each aircraft is set to follow its target. Should a circle occur (in which each aircraft follows another in a continuous loop) a simple roll-off should be used to determine which aircraft will go first: then each of the others will follow in tailing order.

INITIATIVE (cont'd)

1.42 CLOSE ENCOUNTERS / COLLISION

Any two (or more) aircraft that begin a turn in the same hex and altitude and have matching initiative numbers posted (not accounting for any tailing adjustments) must make a Close Encounter check. At least one of the aircraft must be maneuvering in the hex, and neither aircraft may be targeting the other – if either of these conditions is not met there is no risk of collision and no Close Encounter check need be done.

1.421 CLOSE ENCOUNTER CHECK

Each aircraft rolls one die. The sum of the two rolls determines the Close Encounter Rating, which equals the number of Movement Test levels that must be made by the two aircraft that turn to avoid a collision. Pilot Points may be paid to adjust the roll at the cost of one point per plus or minus.

Other modifiers to the dice rolls are: Current MT level = +1 / level
Current Speed = +1 / point > 6
Currently Targeting (different aircraft) = +3

Close Encounter Rating (based on sum of modified rolls above):

<10 = **0**, 10-11 = **1**, 12-13 = **2**, 14-15 = **3**, 16+ = **4**

1.422 COLLISION AVOIDANCE

If the Close Encounter Rating is zero(0) no collision threat exists and the issue is resolved / ended. Otherwise, the aircraft involved should be marked / noted as having a Close Encounter, and may make MTs (during their turn in movement order) to avoid a collision. For every level of MT made by either / both of the two aircraft during the course of their movement the Close Encounter Rating may be reduced by one at the player's choice. If any such reduction in the Rating occurs, the aircraft loses any currently held target. If the Close Encounter Rating is reduced to zero no collision occurs. If the Rating is reduced to zero by the first aircraft to move, the second may move without regard to the collision threat.

1.423 COLLISION

If (during the course of their movement) the aircraft fail to reduce the Close Encounter 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 Close Encounter Rating – these are treated as hits suffered in normal combat (3.20), and include the chance of critical hits. In addition, any targets held by either of the aircraft (if not already lost in attempting to avoid the collision) are lost.

1.424 RAMMING

It can be inferred from the rules above (both in the use of Pilot Points to modify the Close Encounter check as well as the use of an MT taken –if any- to avoid a collision) that a player may choose to force a Close Encounter and/or collision. If deliberate ramming is desired / allowed by all players, an aircraft taking a Movement Test may add –rather than subtract- any MT level made by it to the existing Close Encounter Rating.

1.50 MAINTENANCE

Pilots may service and/or repair their aircraft / guns. If any of the following actions are attempted no other actions (including turning, maneuvering, combat, etc...) may be done this turn –the aircraft must move straight-and-level*. If currently maneuvering, the direction of the aircraft is determined randomly. In addition, any existing target held is lost.

   *Exception: Diving is allowed for fire-extinguishing.

An aircraft that attempts / performs one of the following maintenance actions is moved in this step (in initiative order) instead of during the Movement Phase. Any aircraft targeting an aircraft that moves in the Maintenance Phase (that would otherwise move immediately following it) is also moved in this phase after its target. Such movement counts as this turn's move for those aircraft, and they may not move again during the Movement Phase.

1.51 RELOADING

The pilot may reload a gun (if so equipped) that has used up (or diminished) its original supply.

To reload a gun, a six(6) must be rolled on a die. The cost of each die rolled is one Pilot Point. Any number of the available Pilot Points may be spent, but only one roll may be made per turn and all dice must be rolled together – any Pilot Points used for reloading may not be used for any other action this turn.

If the attempt is unsuccessful, the number of dice rolled on the second (consecutive) attempt on the following turn is increased by two, increased by three on the third attempt, and so on.

If, while attempting to reload, three ones are rolled simultaneously the gun is broken and may not fire again for the rest of the game. Remaining Pilot Points (if any) may be used to cancel any of the ones rolled (on a one-for-one basis) – if the number of ones rolled is thus reduced to less than three the breakage is avoided and does not occur.

1.52 UNJAMMING

If a gun has been jammed in a previous turn the pilot may attempt to remedy the jam. The procedure for unjamming is the same as described above for reloading (including the risk of breakage).

1.53 SPREADING / EXTINGUISHING FIRE

An aircraft that is on fire suffers fire damage: 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 may not be marked in later turns. Once all the boxes are filled the aircraft is considered to be destroyed. NOTE: While it occurs in this phase, the fire spreading roll does not count as a maintenance action.

After the damage roll, an attempt may be made to put out the fire by diving – this action counts as a maintenance action and the aircraft is moved in this phase as dictated above. Roll 1d if a shallow dive, 2d if a normal dive, and 3d if a steep dive. Each result of six(6) on a die extinguishes the fire of the highest row of damage boxes that has suffered fire damage. Each result of one(1) on a die indicates the fire has increased: Fill in three damage boxes for each one rolled. If both (6 and 1) are rolled both effects take place.

Extra dice may be rolled at the cost of two Pilot Points per die. Such dice do not cause spreading if a one(1) is rolled. Any Pilot Points used in this step may not be used for any other action this turn.

2. MOVEMENT PHASE

2.10 ORDER
Aircraft that have not already moved in the Maintenance Phase take turns moving in initiative order within the following categories: Stalled or Spinning Aircraft, Targeting Aircraft, and Non-targeting Aircraft. Ties go (in order) to the aircraft at the higher altitude, or at the higher speed. If still tied, resolve by roll-off. In all cases, an aircraft that is targeting another (and whose initiative –modified by its CV, if any- exceeds the posted initiative of its target) is moved immediately after its target.

2.20 SPEED
Actions taken by an aircraft (such as turns or maneuvers) during its move are made based on its starting speed. All adjustments to speed (via power / drag, and/or movement) should be tracked through the course of its move and will yield an ending speed. Actions taken after movement (such as combat) as well as effects on performance (such as stall / spin checks) are done / determined based on an aircraft's ending speed.

2.21 MINIMUM AND MAXIMUM SPEEDS
Aircraft have a minimum, maximum level, and maximum dive speed. These numbers may vary as the result of the current Movement Test level and/or damage. Matching or exceeding these speeds may trigger a required test (such as Stall or Stress) at the end of an aircraft's move.

2.22 SPEED INCREASE (Power and Diving)
To gain speed via power, roll 1d and modify the result by the aircraft's power rating and/or damage status: One point of speed is gained if the result is >2, and two points are gained if the result is >6. An aircraft rolling >6 may choose to gain only one of the two points. An aircraft at its listed minimum speed adds 1 to the roll, and an aircraft trying to reach its maximum level speed subtracts 1 from the roll. No aircraft may use power to gain speed beyond its maximum level speed.

An aircraft making a shallow dive gains one point of speed, if making a normal dive it gains two points, and if making a steep dive it gains three points – this increase is mandatory.

2.23 SPEED DECREASE (Drag, Climbing, and Movement Tests)
To lose speed via drag, roll 1d and modify the result by the aircraft's drag rating and/or dive status*: One point of speed is lost if the result is >2, and two points are lost if the result is >6. An aircraft rolling >6 may choose to lose only one of the two points. (Exception: If engine hit, destroyed, or off)

   *An aircraft making a shallow dive subtracts 1 from the roll, if making a normal dive it
    subtracts 2 from the roll, and if making a steep dive it subtracts 3 from the roll.

An aircraft that did not dive this turn and that ends its move at a speed above its maximum level speed must roll for drag and take all the speed loss dictated by the roll.

An aircraft making a shallow climb loses one point of speed, if making a normal climb it loses two points, and if making a steep climb it loses three points – this decrease is mandatory.

An aircraft that takes a Movement Test may lose speed as a result of the test (2.612).

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 Movement Points is based on the sum of its starting speed and a die roll – which is modified by Pilot Points and/or CV Bonus (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 Movement Points allotted that turn:

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

2.311 ADJUSTMENTS TO MP ROLL

PILOT POINTS: Pilot Points may be used to reduce the MP roll at the cost of one Point per -1.

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

2.312 CLIMBING / DIVING

Aircraft that are (or will be) climbing or diving will move both horizontally and vertically in the turn. The number of Movement Points allotted for each type of movement is determined by the same die roll but may differ from each other. (eg: An aircraft could have two horizontal and one vertical MP allotted in the same turn.)

To determine the horizontal Movement Points allotted to an aircraft in a normal climb / dive subtract 1 from the MP roll, and if the climb / dive is steep subtract 2 from the MP roll. Shallow climbs / dives have no effect on horizontal Movement Point allotment.

To determine the vertical Movement Points allotted to an aircraft in a shallow climb / dive subtract 3 from the MP roll, and if the climb / dive is steep add 3 to the MP roll. The vertical Movement Points allotted to an aircraft in a normal climb / dive are the same as that determined for horizontal Movement Points.

CLIMB BONUS: The MP roll of an aircraft that is (or will be) climbing is modified by the aircraft's climb rating to determine the allotment of vertical (not horizontal) Movement Points for that turn.

2.32 DECLARATION OF INTENT (optional)

Players are required to state (and attempt) the use of the first Movement Point for that turn before rolling to determine the allotment of Movement Points.

2.40 MOVEMENT TYPES
An aircraft spends each of its allotted MP either 'Going Somewhere' or 'Maneuvering'. An aircraft with more than one MP allotted may combine the two types of movement in any order.
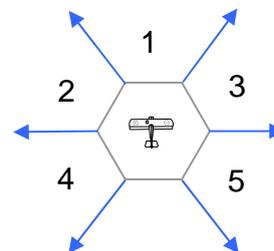
2.41 GOING SOMEWHERE
Aircraft that are moving in this fashion are shown with the wings of the model level, and the model must be facing an adjacent hex.
The adjacent hexes are numbered as shown in the diagram to the right.

The areas of space surrounding the aircraft are also labeled – 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).

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

An aircraft that is Going Somewhere will move straight ahead into the adjacent hex it is facing at the cost of one MP. When the aircraft is moved it may change its facing (turn) within the new hex to any of the adjacent hexsides. There is no MP cost for making a facing change, though it may require a Movement Test (2.60) – if so, the model should be marked to indicate the MT level used (2.61).

2.42 MANEUVERING
Aircraft that are moving in this fashion are shown with the wings of the model banked. The aircraft is considered to have no particular facing.

An aircraft that is Maneuvering remains in its current hex at the cost of one MP. This may require a Movement Test (2.60) – if so, the model should be marked to indicate the MT level used (2.61).

2.421 LEAVING HEX WHEN MANEUVERING
Aircraft that are currently maneuvering that wish to leave the hex may do so by either changing to Going Somewhere status or by remaining in their Maneuvering state. In either case, the current facing of the aircraft is determined randomly (1d). This facing is then adjusted by Pilot Points, the current CV (if any), and the aircraft's current MT level:

> Pilot Points = adjust facing by one hexside in player direction for each one Point spent
> CV = adjust facing by one hexside in player direction for each CV point
> MT level = subtract a number of hexside adjustments made above equal to the level rating

GOING SOMEWHERE: The aircraft moves into the adjacent hex determined by the facing above at the cost of one MP – any facing changes / turns desired may be made as with a normal move.

MANEUVERING: The aircraft moves into the adjacent hex determined by the facing above at the cost of one or two MP: If only one MP is used the CV bonus gained in any MT taken is halved.

2.422 CHANGING FROM MANEUVERING TO GOING SOMEWHERE IN THE SAME HEX
Aircraft that are currently maneuvering that wish to change their movement type to Going Somewhere in the current hex may do so by expending an MP as if maneuvering (taking an MT if required) and then leveling the wings of the model and pointing it towards an adjacent hex.

2.50 CLIMBING / DIVING

In addition to the model indicating whether it is Going Somewhere or Maneuvering, aircraft will also have a vertical-movement status that is shown by the pitching of the model. An aircraft can be either level, climbing (nose pitched up), or diving (nose pitched down) – the latter two states are further subdivided / classified as being either shallow (30° pitch), normal (60° pitch) or steep (90° pitch).

An aircraft will move vertically (using the vertical MP allotment from 2.312) based on the pitch chosen at the beginning of its movement turn. Changes in pitch (if any) may require a Movement Test to succeed (2.60). Any changes in pitch must be declared prior to any other movement – no change in pitch may be done after an aircraft's move is completed. (Exceptions: MT Failure 2.66, Stall / Spin 2.80)

If the vertical MP allotment is greater than required to move to a new level, the aircraft may reduce its pitch after completing the move – the MT test for such a move should be treated in the same way as a two-task move (2.611).
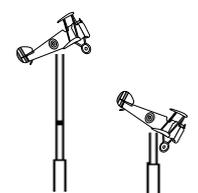
2.51 ALTITUDE LEVELS

Aircraft within an altitude level will be marked / indicated as being in one of three states: In the level, diving out of the level, or climbing out of the level. A single vertical Movement Point allows an aircraft to move from 'in the level' to either diving or climbing out of the level, or from either diving or climbing out of the level to 'in the level' of the adjacent level (below or above, respectively).
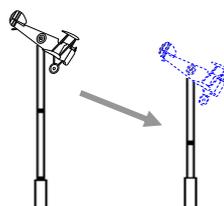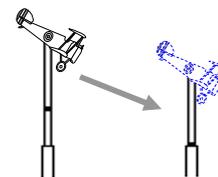
POSTIONS WITHIN LEVELS   MOVEMENT WITHIN / BETWEEN LEVELS
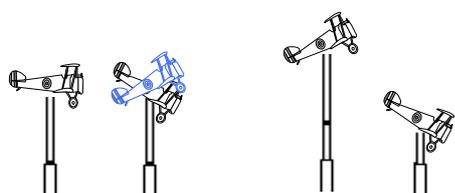
In Level   Leaving Level   In Level to Leaving Level   Leaving Level to In Level
(level or climb / dive)   (climb / dive)

NOTE: Only climbing or diving aircraft may be leaving a level - level aircraft are always 'In Level'.

2.511 LEAVING A LEVEL

Aircraft that are indicated as leaving a level at the beginning of their move MUST use their first vertical Movement Point to climb / dive into the adjacent level regardless of any change in the vertical facing made prior to movement. If a return to the current level is desired, a second MP (either that turn or later) and a successful pitch change are required. Exception: If the vertical MP allotted for a turn is zero, the aircraft may change its vertical facing to the opposite state (climb to dive or dive to climb) and alter its status / position to 'in the level' (provided MT required is passed).

2.51a ALTITUDE LEVELS (optional)

Ignore the 'Leaving' aspect: aircraft will only be in a given level (which are now treated as 200' instead of 500'). Combat may occur between adjacent levels at no range penalty or facing requirement.

2.60 MOVEMENT TEST (MT)
Aircraft changing their pitch/facing and/or maneuver while using an MP may have to take an MT to succeed. An MT involves rolling a pool of dice – any 1s rolled indicate a failure (2.66).

2.61 MT LEVEL
The number of dice called for in an MT determines the MT level of the aircraft. This is based on the number indicated in the MT Table (or the number of dice chosen by a player for a 'maneuver' MT if greater than the indicated amount) and not by the number rolled.

One or two is level one, three through six is level two, and seven or more is level three.

The model is marked to indicate the level regardless of the result of the test. The aircraft remains at this level until a new (or no) test is taken using another MP either in the current or a following turn.

2.611 MT LEVEL TABLE
Cross-reference speed (at start of turn) and desired action to find the number of dice to be rolled.
The number shown in the table is then modified by the aircraft's MT bonus and/or current damage.

speed	1	2	3	4	5	6	7	8	9	10
turn 60°/ pitch 2 steps	-3	-2	-2	-1	0	1	1	2	2	3^1
turn 120°/ pitch 3 steps	-2	-1	0	1	1	2	3	5	9	13^2
turn 180°/ pitch 4 steps	-2	0	1	2	3	5	7	9	13	x
maneuver*	-2	-1	0	1	2	3	5	7	9	13^2

*Aircraft testing to maneuver may roll more dice (up to any amount) than shown in the table.

[1] add two dice per speed point >10   [2] add four dice per speed point >10

Aircraft pulling out of a dive use the row for the number of steps equal to the pitch change plus one.

Two-task movement (eg: turn plus a pitch change) is resolved with a single roll, and is tested with the larger of the two dice pools from the table plus dice equal to the MT level of the other task.

2.612 POWER / SPEED EFFECTS
Aircraft taking a level 2 MT increase their minimum speed by one, and by three if a level 3 MT.

For every two dice indicated on the MT Table (round down) the aircraft loses one point of speed.
If there is a (one die) leftover, the aircraft suffers a -1 penalty to any power roll made that turn.
Two Pilot Points may be used to cancel one of these effects (once per MT).

2.62 AEROBATICS
Using aerobatics adds dice to the pool of an MT. The number added may not exceed the MT level plus one (modified by aircraft's aerobatic rating). Dice added are treated as normal MT dice (ie: qualify for CV bonus, induce speed loss, and risk failure) but do not affect the MT level.

2.63 PILOT POINTS
Pilot Points may be used to add dice to the pool of an MT. The number added may not exceed the number called for on the MT Table plus the number added using aerobatics. These dice qualify for CV bonus but have no other effect (eg: on speed loss and/or failure).

MOVEMENT TEST (cont'd)

2.64 CV BONUS
Aircraft that succeed in an MT (ie: roll no 1s) add an amount to their CV equal to half (rounded down) of the sum of the number of dice called for on the MT Table plus: dice added to a maneuver-in-place test, dice added with aerobatics, and/or dice added with Pilot Points. Also, for every natural six(6) rolled in the test the aircraft adds one to its CV. Dice added to the number rolled because of damage taken (3.20, 3.21) or aircraft / pilot quality (A2) do not qualify for a CV bonus.

The CV bonus for a maneuvering MT is only gained if the range to the target is less than two.

Two Pilot Points may be paid after the test to increase the CV bonus by one.

2.65 CV PENALTY
Aircraft that have targeted the currently-moving aircraft reduce their CVs by all or some of the bonus gained (if any) by the currently-moving aircraft based on the targeting relationship of the two aircraft:

- If the current aircraft has the aircraft targeted, the reduction amount is the entire bonus gained.
- If the current aircraft has a different aircraft targeted, the reduction amount is ¼ the bonus gained.*
- If the current aircraft has no aircraft targeted, the reduction amount is ½ the bonus gained.*
     * round all fractions down

2.66 FAILURE
Any 1s rolled during a test count as a failure. Pilot Points may be used to cancel 1s (on a one-for-one basis). For each (uncancelled) failure roll 1d, sum the roll, and apply the result:

sum of roll	1-5	6-8	9-10	11-12	13-14	15-16	17+
CV	0	0	-1	-1	-2	-2	-3
move	-1	-1	-2	-2	-2	-3	-3
speed	0	-1	-2	-2	-2	-2	-3
stress	n/a	n/a	0	-1	-1	-2	-2

    CV: reduction in CV
    move: if turning, result is reduction in number of hexsides turned
            if changing pitch, result is reduction in number of steps moved
            if maneuvering, face aircraft as per spin recovery (2.821) and move into hex.
    speed: addition to any speed loss incurred from the test
    stress: modifier applied to a mandatory stress test (or to an existing test if required)

If a test involved multiple actions the player chooses the application of the result in the "move" column. If the "move" penalty is greater than the number of hexsides / steps / maneuver actions attempted, lower the aircraft's pitch by one step and/or increase speed loss by one for each extra penalty (player's choice).

Failing an MT does not end an aircraft's movement: if it has MP remaining it continues its turn.

2.70 STRESS TEST

Any aircraft attempting a level 3 MT or ending its move at a speed greater than their maximum dive speed must test for stress damage. This test takes place upon completion of the MT 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: current damage = -1 / filled row, speed = -1 / pt > max dive+1, MT dice = -1 / die > 8

2.80 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
               Pilot Points may be used to modify the roll at the cost of one point per ±1 modifier

2.81 STALLING

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

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

2.82 SPINNING

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

The model is marked as spinning, is pitched to a normal dive.
On the following turn's movement it moves vertically in its current hex as per the normal movement rules with the exception that no speed is gained for the dive.

2.821 SPIN RECOVERY

Recovery may be attempted at the end of the move. Recovery is made by rolling a six(6) on a die. Pilot Points are used to buy dice, and the dice must be rolled together. If successful, the pitch remains in a normal dive and the facing of the aircraft is determined randomly (modified by PP if available).

3. COMBAT PHASE

3.10 FIRING
An aircraft must have current spot and hold at least a one-CV advantage on its target.

Some or all of the CV is multiplied by the gun rating – this equals the number of dice rolled in the attack. Dice may then be added using Pilot Points. The total is modified by range and burst size:

   Range - one hex = ½ dice, > one hex or level = no attack (+1 to range if one level below target)
   Burst Size* – one = ½ dice, two = all dice, three = +½ dice (player may choose smaller burst size)

      *burst size max is lesser allowed by speed difference or MT-level sum:
         speed difference – 0-2 = size three burst, 3-4 = size two burst, 5+ = size one burst
         sum of MT levels: 0-1 = size three burst, 2 = size two burst, 3+ = size one burst

3.11 JAMMING
If three ones(1s) are rolled in an attack a gun jams, if four ones are rolled two guns jam (if only one gun, jam is permanent). Pilot Points may be used to cancel ones (on a one-for-one basis). Ones rolled in an attack on dice that were bought with Pilot Points do not count towards jamming.

3.12 CV LOSS
The first five points of CV used to attack are lost. Any amount greater than five (or those not used to attack) are retained and carried over to the following turn.

3.20 DAMAGE
A hit is scored for each 6 rolled in an attack. Roll 1d for each hit: a result of 1-5 indicates the number of damage boxes to be marked off on the target's log, and a result of 6 indicates a critical hit (3.22).

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.

3.21 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. In addition, 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.

3.22 CRITICAL HITS (roll 2d)
2 = aircraft explodes   8 = control damage (+2 dice to MTs)
3 = engine destroyed* (roll drag +2 each turn)   9 = control damage (+4 dice to MTs)
4 = engine hit* (-2 to power rolls)   10 = pilot wounded (-½ points, round up)
5 = fuel leak (treat as #3 or as smoking)   11 = pilot wounded (-all points)
6 = engine hit* (-1 to power rolls)   12 = pilot killed
7 = structural damage (mark current and next rows)

   * roll 1d: 4-6 = smoke, -2 Pilot Points. If smoke, roll 1d each move: 6 = fire, -2 more Pilot Points

A1. CREW-SERVED WEAPONS

A1.0 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.

A2.0 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: +1 point for every two dice rolled (rounded down) and +1 for every natural 6. 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).