wings™

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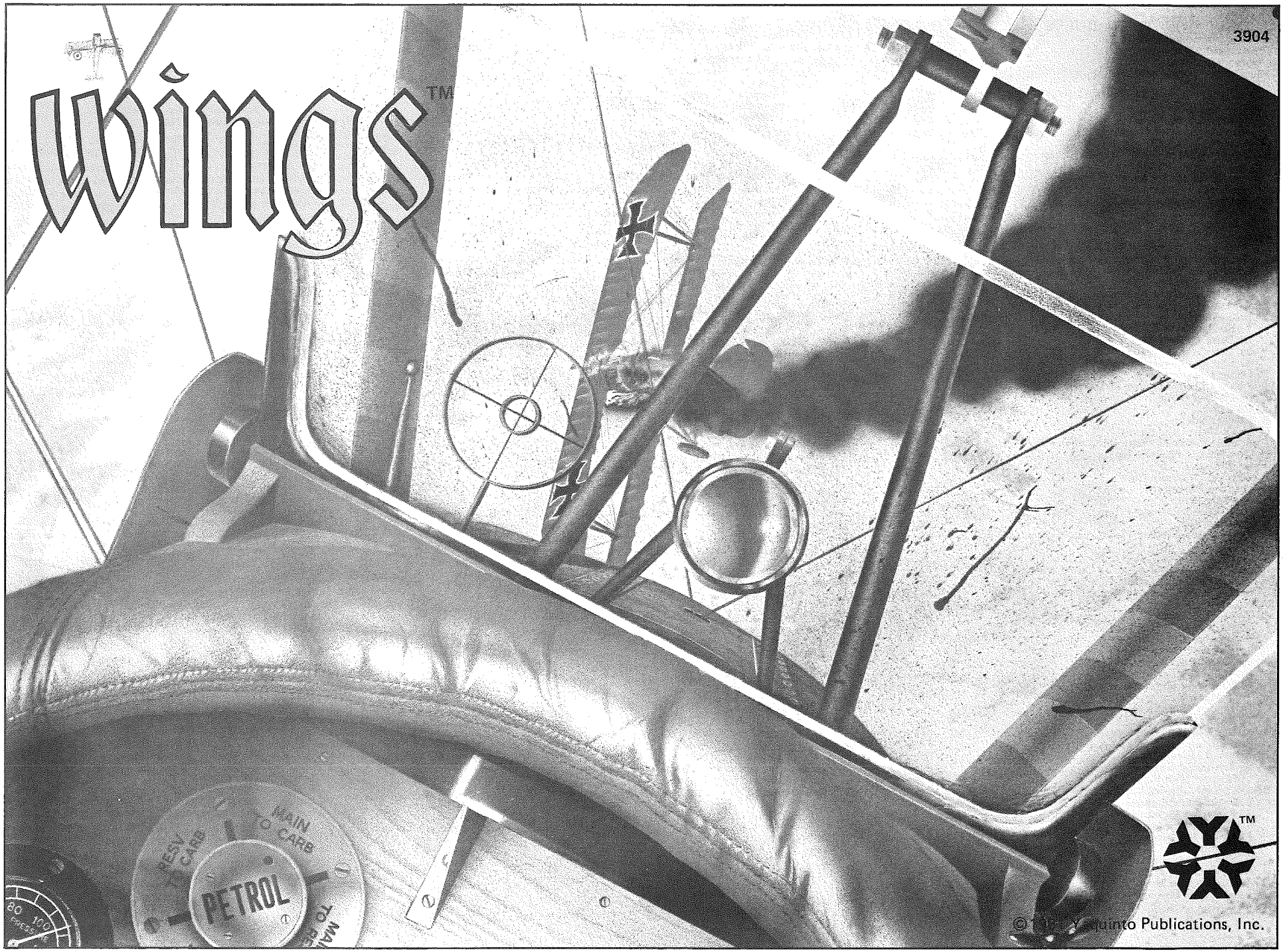

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INTRODUCTION TO THE RULES

"There shall be wings. If the accomplishment is not for me, for some other. . ." — Leonardo da Vinci

I. GENERAL INTRODUCTION

WINGS is a tactical game of air combat during World War One, concentrating on the period 1916—1918. The game includes many of the most important and/or interesting planes used by the combatants. The game can be played by one or more players, each commanding one or more individual planes. The game has information for setting up air actions of various types; these *scenarios* being very flexible, and giving a great variety of games that can be played using the same rules.

Since the game mechanics represent movement and combat in a three dimensional environment, some imagination and practice is required for players to visualize and understand the concepts which the game simulates. The mapboard represents not only hexes laid out side-by-side, but also a "depth" of thousands of feet. Units may occupy the same or adjacent hexes, and still be far apart if their altitudes are different. A plane does not necessarily fly straight and level, and, in this game, may be banked to one side or the other, have its nose pointed up or down, or even fly upside down.

These rules may seem to be long and complex, but their bulk is deceptive. The rules need not be memorized, but should be carefully and thoroughly read. To jog player's memories, the most commonly used and needed information is given on the Game Cards, the Data Cards, and the Command Sheets for easy accessibility during play. In fact, players will discover that learning the game consists of learning relatively few procedures, and understanding what the information on the Game Cards, Data Cards, and Command Sheets means. The rules should be used as a reference for questions that arise during the actual play of a game, and a Table of Contents is included for ease in locating needed rules. The rules do not have to be learned at one sitting. Games can and *should* be played using only the Basic Game Rules, until these are mastered and thoroughly understood. Then, learn the Advanced Game Rules, and play some games with those. The Optional Rules should be learned last, and selected Optional Rules introduced as the player's mastery of the game increases. The Duel Game Rules should be tried only by players who have fully mastered the Basic and Advanced Games and the Optional Rules, and desire a game of great complexity and detail. If players master each part of the rules before going into the next part, they will find that learning and mastering the rules will be much easier. There is no need for a new player to read further than the end of the Basic Game Rules before proceeding to the scenarios to begin setting up the first game.

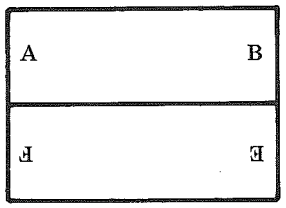
II. THE GAME SCALE

Each hex on the mapboard is roughly 40 yards from side to side. Each Plane, Gun, Balloon, etc. unit represents one actual item. Each Turn represents about four seconds of actual time. Each Altitude Level represents a real height of 25 feet. Each Speed Factor equals about 20 miles per hour.

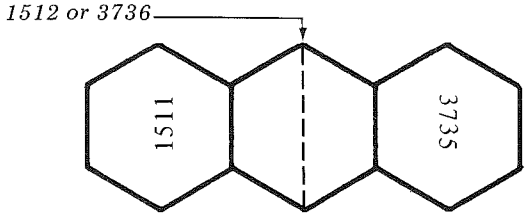
III. GAME COMPONENTS

The following components are used for the play of *WINGS*. Please inspect these components carefully, and familiarize yourself with them while reading through this section. Some components require some preparation before they can be used in a game, so follow the directions for preparing them.

A. MAPBOARD: The mapboard consists of three sections that, once broken carefully apart, can be rejoined together in a variety of ways. The mapboard shows a stylized view of the earth from the air. This view is strictly decorative, and only a few features have any effects on the play of the game. The mapboard sections form the playing surface on which the units are placed and moved. A hexagonal grid is printed on the mapboard to determine movement, facing, ranges, and the exact position of the units. An individual hexagon is called a "hex", and its six sides are called "hexsides". Each hex contains a white Line of Sight Dot (called a "Dot") used for firing and sighting. Most hexes also have a four-digit identification code that serves as its designation. The hexes where the mapboard sections join do not contain an identification number, as these numbers would change depending on how the mapboard sections are joined together. These hexes can be identified by referring to either of the adjacent hexes on the joining mapboard sections, as if they were a continuation of those hexes' numbering sequence. *For example, mapboard sections "AB" and "EF" are joined as follows:*



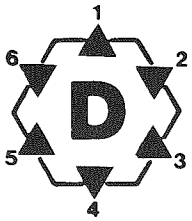
The unnumbered hex between hex 1511 on section "AB", and hex 3735 on section "EF" can be identified as either hex 1512 (a continuation of the sequence from hex 1511) or hex 3736 (a continuation of the sequence from hex 3735).



The mapboard features used in the game are as followers:

1. MAPBOARD SECTIONS: The mapboard has three sections, called, from the letters printed on them, sections "AB", "CD", and "EF". Each individual letter identifies half (split by the mapboard fold) of a mapboard section.

2. DIRECTIONAL HEXAGONS: The labeled hex on each half of a mapboard section is called a "Directional Hexagon", and provides a reference for every hexside on their mapboard section, as the numbered hexsides provide the manner in which the sides of all hexes in that mapboard section are identified. Each side of a hex is identified by a number, that number corresponding to the number assigned to that same side of the Directional Hexagon on that mapboard section.



3. CENTER HEXES: The two hexes that are in the center of each mapboard section are called the "Center Hexes", and are marked with a black six-sided star.

4. SET UP HEXAGON: The large hexagon printed on the mapboard is used for set up purposes in many scenarios. The sides of this hexagon are identified by Roman Numerals "I", "II", "III", "IV", "V", and "VI".

5. "ENDLESS" MAPBOARD: Unless surface terrain is used in a scenario, it is possible to avoid "flying" off the mapboard by adjusting the mapboard sections. Unused sections can be removed, and rejoined during the course of play at any edge or end where a unit might leave the playing area.

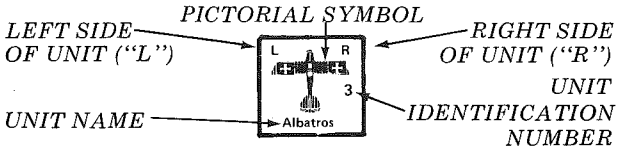
B. UNIT COUNTERS: Die-cut counters of contrasting colors are provided for the play of the game. There are two sheets of these counters, and, when punched out, they provide a variety of pieces of many sizes and shapes. These are the playing pieces, and they are called "units". Keep these units separated by color and type once punched out, as this greatly speeds the set up and play of the game.

Each unit has a pictorial representation of what it represents. Numbers appear for further identification and differentiation. Plane units with a green background are Allied (used by Belgium, France, Great Britain, Italy, Russia, and the United States), while those with a tan background are Central Powers (used by Austria-Hun-

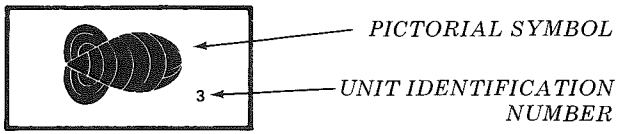
gary and Germany). Non-plane units have various colored backgrounds, and generally may be used by either side, depending on the scenario. The units contain some of the information needed to play the game. Carefully examine the examples below:

1. COMBAT UNITS: All Combat units have the ability to fire at opposing units.

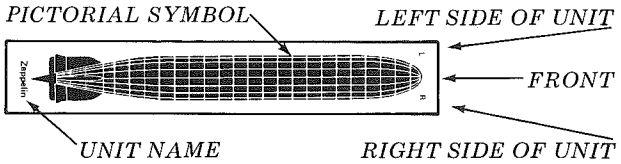
a. PLANE UNITS: "Planes" represent individual heavier-than-air aircraft.



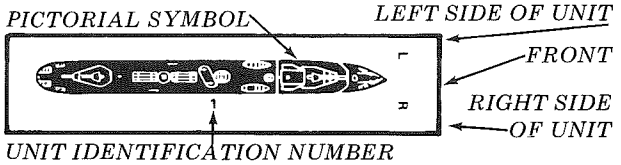
b. BALLOON UNITS: These represent individual tethered observation balloons. These units each occupy *two* hexes on the mapboard.



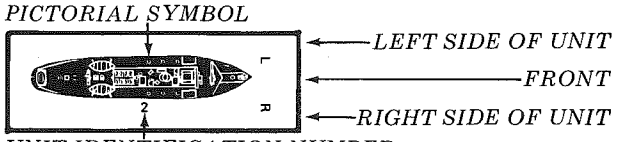
c. ZEPPELIN UNIT: This represents an individual lighter-than-air airship. This unit occupies *five* hexes on the mapboard.



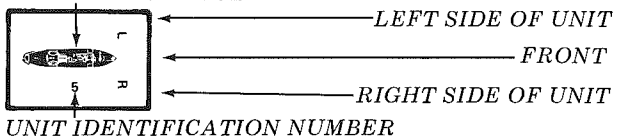
d. SHIP UNITS: These represent individual small ships.
(1) LARGE ESCORT SHIP UNIT: This represents an escort ship of destroyer or small light cruiser size. This unit occupies *three* hexes on the mapboard.



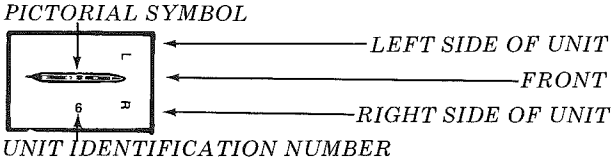
(2) ESCORT SHIP UNITS: These represent escort ships of about 150 to 250 feet in length. These units occupy *two* hexes on the mapboard.



(3) SMALL ESCORT SHIP UNITS: These represent secort ships that are under 150 feet in length.

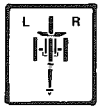


(4) SUBMARINE SHIP UNIT: This represents a submarine on the surface.



e. GUN UNITS: These represent a variety of different size guns located on the ground. All show the left and right sides of the units, and have an identification number.

HEAVY GUN
(Anti-Aircraft — "Archie" or Field Artillery).

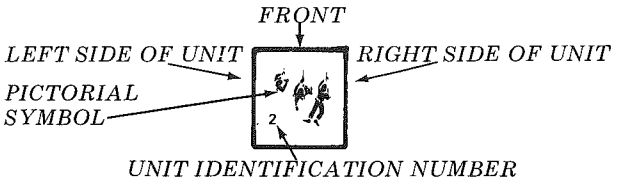


AUTOMATIC CANNON
(Fast-Firing — usually 20mm).

MACHINEGUN
(Automatic Weapons).

The fronts of all Gun units face the top of the page.

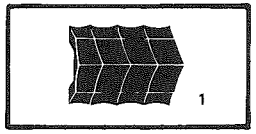
f. INFANTRY UNITS: These represent small bodies of rifle-armed infantrymen.



2. TARGET UNITS: Target units can be attacked, but have no ability to fire at opposing units.

a. INSTALLATION UNITS: These are immovable, man-made installations. All include only a Pictorial Symbol and an identification number.

NOTES: Hanger units may also be used to represent large buildings, or a Zepplin Shed.



HANGER UNITS
(occupy two hexes)

BUILDING UNITS

TRENCH UNITS

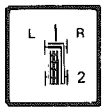
b. VEHICLE UNITS: These each represent individual vehicles. All show the left and right sides of the units, and have an identification number.

LIMBER UNIT

TANK UNIT

TRUCK UNIT

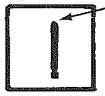
WAGON UNIT



The fronts of all Vehicle units face the top of the page.

3. MISCELLANEOUS UNITS: These units are used to record events and information during a game.

a. SMOKE UNITS: These record the locations of Smoke Screens.



b. TORPEDO UNITS: These record the locations of torpedoes after they are dropped.

c. FLAME UNITS: These record Fires.

d. BANK AND SEQUENCE UNITS: These record Bank Attitudes for planes, and are usually called "Bank units". In the Mass Game Rules, they are called "Sequence units".

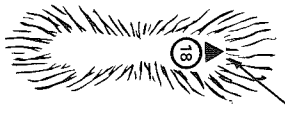
e. FLEXIBLE GUN UNITS: These record the facings of Flexible Guns on Planes.

f. BANK AND ALTITUDE UNITS: These also record Bank Attitudes for planes, and are usually called "Bank units". In the Mass Game Rules, they are called "Altitude units".

4. TERRAIN UNITS: These represent natural terrain features. Depending on their size, they can occupy one or more hexes on the mapboard. All include a Pictorial Symbol and (except for the lone Sun unit) an identification number. Units that occupy more than one hex also include a "Direction Arrow" (the Sun unit also has a Direction Arrow, but its use is different from the others).

a. GROUND TERRAIN UNITS: These represent natural ground features of sufficient height to affect "flying".

HILL UNITS



WOODS UNITS

DIRECTION ARROWS

b. SKY TERRAIN UNITS: These represent natural sky "terrain".

CLOUD UNITS

SUN UNIT

DIRECTION ARROWS

C. UNIT SORTING AND STORAGE TRAY: A compartmented plastic tray is included for the separation and storage of the units.

1. SORTING AND LABELING: Sort the smaller units into the pockets of the tray, placing one or two types of units in each pocket. The larger units are too big for the pockets, and should be spread out in the bottom of the game box under the tray for storage. It is helpful to label each pocket with a china marker. Sorting the units greatly speeds the set up of the game, and time spent sorting the units as they are punched out is time well spent.

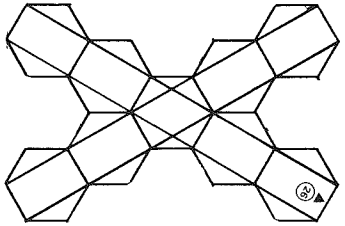
2. FLAT BOX STORAGE: If the game box is kept flat and upright for storage, simply lay the tray in the bottom of the box. Arrange the mapboards and other game components on top to completely cover the tray, and these will hold the units in their proper pockets.

3. BOX STORED ON EDGE: If the game box is not stored flat, or is usually carried on its side, care must be taken to prevent the units from falling out of their proper pockets. A cardboard "lid" should be made for the tray, secured at the sides with cellophane tape "hinges".

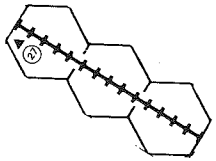
D. GAME CARDS: The Game Card contains the most used and needed information, charts, and tables required for playing the game. Two copies are included so that each side has one available for reference during a game.

E. SET UP CARDS: The Set Up Card contains the charts and tables used for game set up, as well as some less-used tables required for playing the game. Two copies are included so that each side has one available for reference during a game. The Set Up Cards also include *printed* Installation units. These must be carefully cut out from the card for use in play. Cut the cards along the dotted lines, then trim around the lines of each unit. These Installation units are:

LANDING FIELD UNITS



RAILLINE UNITS



F. COMMAND SHEET PAD: These sheets are used to record the orders for the units, and to record hits on them. Each player requires at least one sheet to play a game.

G. RULEBOOK: This booklet contains all the rules of play for *WINGS*, information on setting up scenarios, and additional reference material.

H. DATA CARDS: The 50 Data Cards give the individual information for each type of Plane unit included in the game. Each Data Card is individually numbered to help in identification (Note: There are gaps in the numbering sequence on these cards — a second game containing additional Data Cards to be released during 1982 or 1983 contains the missing numbers to complete the sequence). The Data Cards must be broken carefully apart to be used for play. Note that some types of units may be used with more than one Data Card, and that some Data Cards may be used with more than one type of unit. *For example, the "Nieuport" Plane units may be used with the Nieuport 11, Nieuport 12, or Nieuport 17 Data Cards (Numbers 6, 8, and 11).*

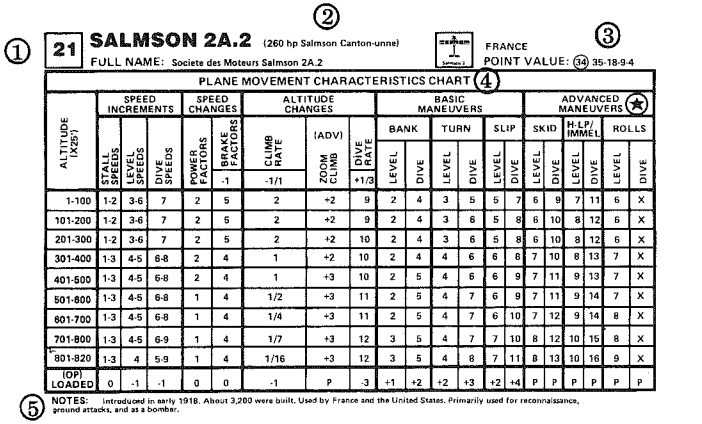
I. DICE: Two standard six-sided dice are included in the game, one white and one colored.

J. OTHER: Not included in the game, but necessary for play, is a pencil for each player. Pencils are recommended over pens to allow erasing.

IV. INTERPRETING THE DATA CARDS

The Data Cards display the individual information needed to move and fight your Plane units. A single Data Card serves as a reference for *all* Plane units of that type which a player has on the mapboard. Each Data Card has information printed on *both* sides of the card, all of this information relating to the same type of plane. Please examine the following sample Data Card carefully:

FRONT



① 21 **SALMSON 2A.2** (260 hp Salmson Canton-unne) ② FRANCE ③ POINT VALUE: (34) 35-18-9-4

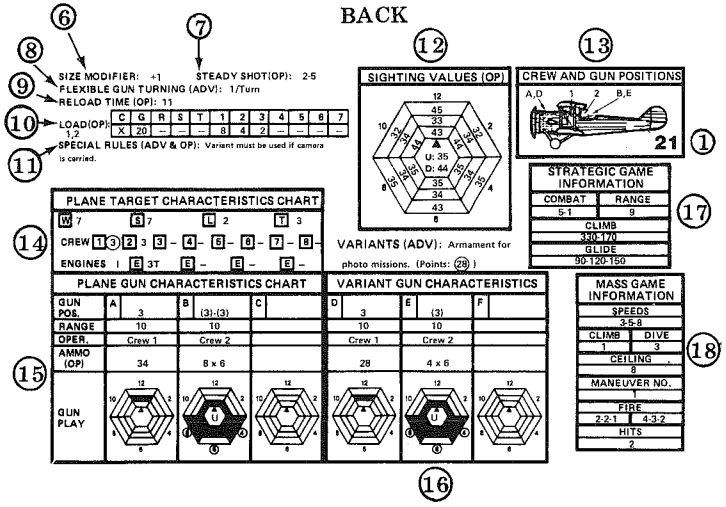
FULL NAME: Societe des Moteurs Salmson 2A.2

PLANE MOVEMENT CHARACTERISTICS CHART ④

ALTITUDE (X25')	SPEED INCREMENTS: STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	SPEED CHANGES: POWER FACTORS	BRAKE FACTORS	ALTITUDE CHANGES: CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BASIC MANEUVERS: BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	ADVANCED MANEUVERS ★: SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-6	7	2	5	2	+2	9	2	4	3	5	5	7	6	9	7	11	6	X
101-200	1-2	3-6	7	2	5	2	+2	9	2	4	3	6	5	8	6	10	8	12	6	X
201-300	1-2	3-6	7	2	5	2	+2	10	2	4	3	6	5	8	6	10	8	12	6	X
301-400	1-3	4-5	6-8	2	4	1	+2	10	2	4	4	6	6	8	7	10	8	13	7	X
401-500	1-3	4-5	6-8	2	4	1	+3	10	2	5	4	6	6	9	7	11	9	13	7	X
501-600	1-3	4-5	6-8	1	4	1/2	+3	11	2	5	4	7	6	9	7	11	9	14	7	X
601-700	1-3	4-5	6-8	1	4	1/4	+3	11	2	5	4	7	6	10	7	12	9	14	8	X
701-800	1-3	4-5	6-9	1	4	1/7	+3	12	3	5	4	7	7	10	8	12	10	15	8	X
801-820	1-3	4	5-9	1	4	1/16	+3	12	3	5	4	8	7	11	8	13	10	16	9	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-3	+1	+2	+2	+3	+2	+4	P	P	P	P	P	P

⑤ NOTES: Introduced in early 1918. About 3,200 were built. Used by France and the United States. Primarily used for reconnaissance, ground attacks, and as a bomber.

BACK



⑥ SIZE MODIFIER: +1 ⑦ STEADY SHOT(OP): 2-5
⑧ FLEXIBLE GUN TURNING (ADV): 1/Turn
⑨ RELOAD TIME (OP): 11
⑩ LOAD(OP): 1,2 — C G R S T 1 2 3 4 5 6 7 / X 20 – – – 8 4 2 – – – –
⑪ SPECIAL RULES (ADV & OP): Variant must be used if camera is carried.

⑫ SIGHTING VALUES (OP): 12; 45, 33, 43; 10, 32, 34, 14, 2; 36, 54, 41, 23; U: 35, D: 44; 35, 34, 43; 6, 4

⑬ CREW AND GUN POSITIONS: A,D 1 2 B,E — 21 ①

STRATEGIC GAME INFORMATION: COMBAT 5-1; RANGE 9; CLIMB 330-170; GLIDE 90-120-150 ⑰

⑭ PLANE TARGET CHARACTERISTICS CHART: W 7, S 7, L 2, T 3; CREW 1 ③ 2 3 3 – 4 – 6 – 8 – 7 – 8 –; ENGINES 1 E 3T E – E – E –

VARIANTS (ADV): Armament for photo missions. (Points: ㉘)

⑮ PLANE GUN CHARACTERISTICS CHART / VARIANT GUN CHARACTERISTICS

GUN POS.	A	B	C	D	E	F
	3	(3)-(3)		3	(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	34	8 x 6		28	4 x 6	
GUN PLAY	12, 2, 4, 6, 8, 10	12, 2, 4, 6, 8, 10, U	12, 2, 4, 6, 8, 10	12, 2, 4, 6, 8, 10	12, 2, 4, 6, 8, 10, U	12, 2, 4, 6, 8, 10

⑯

MASS GAME INFORMATION ⑱: SPEEDS 3-5-8; CLIMB 1; DIVE 3; CEILING 8; MANEUVER NO. 1; FIRE 2-2-1 | 4-3-2; HITS 2

FRONT

① DATA CARD NUMBER: This is the Data Card's identifying number. Cards are grouped by country of origin, and numbered in sequence by date of introduction. This number is also repeated on the back of the Card.

② IDENTIFICATION: The plane name, country of origin, engine size, manufacturer, and the correct type of Plane unit or units to be used with the card is given here. The "front" of all the Plane unit pictures on the Data Cards points to the top of the card.

③ POINTS: These are the point values for this type of plane. Five numbers are given:

a. COMBAT POINT VALUE: The first and circled number is the plane's "Combat Point Value". This is a numerical evaluation of the plane in comparison to the other planes in the game. This numerical evaluation is *not* perfect, as there are so many variations due to altitude, the rules used, the mission, etc., but, generally speaking, matchups of plane types with the same or close Combat Point Values will provide a well-balanced game.

b. VICTORY POINT VALUES: There are four numbers given for "Victory Point Values". The first of these four numbers is the "Total Victory Point Value" of the entire plane and crew. This is the only one used for games using only the Basic Game Rules. The second of these four numbers is the "Plane Destroyed Victory Point Value", the third is the "Serious Damage Victory Point Value", and the fourth is the "Light Damage Victory Point Value" — these last three are all explained in the Advanced Victory Points section of the rules.

c. VARIANT POINTS: Variants (variations from the standard plane configuration on the Data Card) have Points listed also. If only the circled Combat Point Value is displayed for a Variant, this means that the Variant's Victory Point Values are identical to those of the standard plane. If different, they *are* listed.

④ PLANE MOVEMENT CHARACTERISTICS CHART: This portion of the Data Card displays the information necessary to move and maneuver the plane. The movement characteristics of all planes vary according to their current altitude. The movement characteristics of a plane that apply during a Turn are those which are on the same line as the plane's altitude at the start of that Turn (the plane's "Initial Altitude"). *For example, a plane at an altitude of "350" will move and maneuver using the movement characteristics found on the line to the right of the "301-400" altitude range.* Only these will apply during that Turn, even if the plane changes altitude into a different altitude range during the Turn.

a. ALTITUDE: The left-hand column of the Plane Movement Characteristics Chart gives a series of altitude ranges, starting at "1", and working up to that plane's "Ceiling" (the *maximum* Altitude Level at which the plane can move). Note that each Altitude Level equals 25 actual feet. *For example, 200 Altitude Levels equals 5,000 actual feet in height.* Players do not have to concern themselves with the actual height in feet while playing a game. They need only consider the number of Altitude Levels.

b. SPEED INCREMENTS: These columns display the various increments into which the plane's Speed Factors fall. *For example, on the sample Data Card, at the altitude range "301-400", the Stall Speed Increment is "1-3" Speed Factors, the Level Speed Increment is "4-5" Speed Factors, and the Dive Speed Increment is "6-8" Speed Factors.*

c. SPEED CHANGES: The numbers in the Speed Change columns display the *maximum* number of Power or Brake Factors that can be applied to the plane during any one Turn. At the very top of the Brake Factors column is an additional number ("-1" on the sample Data Card) called the "Engine Off Brake Factor" which is explained in the Advanced Game Rules — it is not used in the Basic Game.

d. ALTITUDE CHANGES: These columns display the Climb and Dive Rates for the plane. The fractions at the tops of the Climb and Dive columns show the Speed Factors which can be lost or gained by changing altitude, and are called, respectively, the "Climb Rate Fraction" and the "Dive Rate Fraction". The numbers actually in the columns show the "Climb Rates" and "Dive Rates". The middle column in this section, "Zoom Climb", is not used in the Basic Game, but is explained in the Advanced Game Rules.

e. BASIC MANEUVERS: These columns show three Maneuvers that the plane can perform. The numbers in these columns show the *minimum* number of hexes that a plane must enter before it can execute a certain Maneuver. For each Basic Maneuver, the "Level" or "Dive" column under it is used, depending on the plane's Initial Speed.

f. ADVANCED MANEUVERS: These columns show three more Maneuvers that the plane can perform, and have the same meanings as the numbers in the Basic Maneuvers section. These Maneuvers are explained in the Advanced Game Rules, and are not used in the Basic Game. Some Data Cards (as in the sample) have a circled star (✪) next to the words "Advanced Maneuvers". This is ignored in the Basic Game Rules, and is explained in the Advanced and Optional Rules.

g. LOADED: The bottom line of the Plane Movement Characteristics Chart contains modifiers to be used when the plane is "loaded" with bombs or other heavy objects. This line is not used in the Basic or Advanced Games, but is explained in the Optional Rules.

NOTES ON THE PLANE MOVEMENT CHARACTERISTICS CHART:
"X": An "X" indicates that a Maneuver may not be performed by that plane, or that an altitude range is not used because it is above the plane's Ceiling.
"P": Found on the "Loaded" line. Indicates "Prohibited", and shows that something is impossible while the plane is Loaded.
Parenthesis: Many columns contain two numbers — the normal one, and one in parenthesis. The number in parenthesis usually refers to some Variant, and is used as mentioned in the plane's *Special Rules*. The numbers in parenthesis are *not* used in the Basic Game.

⑤ NOTES: This mentions when the plane was first available for combat, production information, what nations used the plane, its primary uses in combat, and any nicknames it may have had.

BACK

⑥ SIZE MODIFIER: This affects firing *at* the plane, and tells how relatively large a target the plane makes.

⑦ STEADY SHOT: These two numbers affect firing by the plane. This is not used in the Basic and Advanced Game Rules, but is explained in the Optional Rules.

⑧ FLEXIBLE GUN TURNING: This displays the number of hexsides a Flexible Gun on the plane may be turned during one Turn. It is not used in the Basic Game, but is explained in the Advanced Game Rules.

⑨ RELOAD TIME: This displays the number of "Impulses" required to reload the plane's Gun or Guns. It is not used in the Basic or Advanced Game Rules, but is explained in the Optional Rules.

⑩ LOAD: This displays the possible Loads that a plane can carry into the air. It is not used in the Basic or Advanced Game Rules, but is explained in the Optional Rules. The letters and numbers mean the following:

C: Camera. Cameras were heavy and bulky, and would be carried *instead* of some other Load. An "S" indicates that the plane can carry a Camera.
G: Grenades. The number under the "G" indicates the number of Grenades the plane can carry. Grenades can be carried alone, or *in addition to* a Load of "1" or "2" Bombs also Loaded on the plane.
R: Rockets. The number under the "R" indicates the number of Rockets the plane can carry (only the Allies used Rockets).
S: Smoke Candles. The number under the "S" indicates the number of Smoke Candles the plane can carry.
T: Torpedo. If a "1" appears under the letter "T", the plane can carry one Torpedo.
BOMBS: The sizes of Bombs are rated by the numbers "1" through "7". The number under each of these numbers indicates the number of each size Bomb a plane can carry. The Bomb numbers indicate bombs of approximately the following sizes:

"1": 16-30 pounds.
"2": 40-70 pounds.
"3": 90-180 pounds.
"4": 200-400 pounds.
"5": 500-700 pounds.
"6": 1650 pounds.
"7": 2200 pounds.

The number or numbers directly under the word "Load" are the identifying numbers of the Crewmen required to Drop or Jettison the Load.

(11) SPECIAL RULES: These are any special or unusual rules that apply to any way in which the plane differs from normal. Many are self-explanatory, while others receive mention in the appropriate sections of the Advanced or Optional Rules. They are not used in the Basic Game.

(12) SIGHTING VALUES DIAGRAM: This is not used in the Basic and Advanced Game Rules, but is explained in the Optional Rules.

(13) CREW AND GUN POSITIONS DIAGRAM: This is a side view of the plane. Arrows point out the locations of crewmen and gun positions on the plane, numbered and lettered to correspond to the information in the Plane Target Characteristics Chart. The front of the plane is always to the left of the picture.

(14) PLANE TARGET CHARACTERISTICS CHART: This displays the number of hits required to destroy the various parts of the plane. These parts are identified as follows:

[W] : Wings [S] : Structure (Fuselage)

[L] : Fuel Tank or Lines [T] : Flight Controls or Surfaces

CREW: Individual Crewmen are numbered. Pilots (the Crewmen who normally "fly" the plane) have their numbers circled. The Crewmen are listed in their seating arrangement from the front of the plane. *For example, Crewman "1" sits in front of Crewman "2", while Crewman "3" sits behind Crewman "2".*

ENGINES: Engines are listed from left to right according to their locations from the left side to the right side of the plane. Other information about the engines is listed by a series of letter codes.

a. ENGINE TYPE: A letter placed directly next to the word "Engine" describes the type of engine used by the plane:

I: Inline Engine (Water-cooled).
R: Rotary Engine (Air-cooled).

b. ENGINE PLACEMENT: The number (always "3") shows the number of hits required to destroy the individual engine. The number is always followed by a letter that describes the engine placement:

P: Pusher Engine. Placed with the propeller to the rear to "push" the plane through the air.
T: Tractor Engine. Placed with the propeller to the front to "pull" the plane through the air.

c. ENGINE POSITION: The Engine Placement Letter is often followed by another letter or letters that describes the engine's position on the plane.

LW: Left Wing. The engine is located in the wing area, to the left of the fuselage.
RW: Right Wing. The engine is located in the wing area, to the right of the fuselage.
W: Wing. The engine is located in the wing area, above the fuselage.
No Letter: The engine is located in the fuselage. All planes used in the Basic Game have an engine located in the fuselage.

(15) PLANE GUN CHARACTERISTICS CHART: This gives information regarding the plane's Guns.

a. GUN POSITION, VALUE, MOUNTING, AND TYPE: This information is all displayed on the line opposite the words "Gun Pos.".

(1) GUN POSITION: The letters "A", "B", and "C" identify the possible Gun Positions on a plane. Most planes do not use all three of these Gun Positions. If the word "OR" appears, it indicates that the player has a choice of which Gun Position to use on an individual plane. If the words "AND/OR" appear, it indicates that the player has a choice of Gun Positions or the plane can also carry Guns in both Gun Positions. If the words "AND SOME ALSO CARRIED" appear, it indicates that the player has the choice of carrying additional guns.

(2) GUN VALUE: The Gun will have a value of either "2" or "3", or be identified as a Cannon ("CN").

(3) GUN TYPE: The examples below show how the types of guns are identified and differentiated:

3 **Fixed Machinegun:** Immovably mounted. Identified by the Gun Value number appearing alone. Only these are used in the Basic Game.

(3) **Flexible Machinegun:** Mounted so as to swing through a horizontal and vertical arc. Identified by the Gun Value number being in parenthesis.

[3] **Slide Machinegun:** Mounted so as to swing through a vertical arc. Identified by the Gun Value number being in brackets.

[3] **Fixed Heavy Machinegun:** Immovably mounted. Identified by the Gun Value number being enclosed by a box.

([3]) **Flexible Heavy Machinegun:** Mounted so as to swing through a horizontal and vertical arc. Identified by the Gun Value number being enclosed in both a box and parenthesis. This is not found on planes, only in ground locations.

(CN) **Fixed Heavy Cannon:** Immovably mounted. Identified by the Cannon letters ("CN") being enclosed by a circle.

((CN)) **Flexible Light Cannon:** Mounted so as to swing through an arc. Identified by the Cannon letters being enclosed in both a circle and parenthesis.

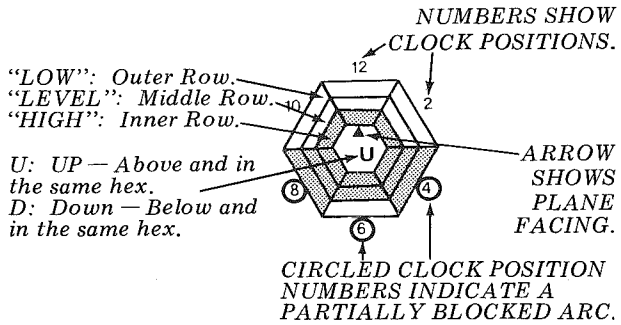
(4) GUN MOUNTING: If two or more Guns are in the same Gun Position, they are joined together by a dash ("-") to show that they move and/or fire together.

b. GUN RANGE: This is the maximum range that the Gun or Guns in a Gun Position may shoot. Cannon have two ranges. The first is their range for air-to-air combat, and the second (in parenthesis) is their range against targets on the ground.

c. OPERATING CREWMAN: This information is displayed on the line opposite the word "Oper.". This gives the identifying number of the Crewman or Crewmen who can operate (fire and load) the Gun or Guns in each Gun Position.

d. AMMUNITION (AMMO): This is the amount of ammunition available in the Gun Position. If lines are deleted between Gun Positions, this indicates that the listed Ammunition may be used by any of those Gun Positions. This is not used in the Basic or Advanced Games, but is explained in the Optional Rules.

e. GUN PLAY DIAGRAM: The shaded "Arcs" show where the Guns in a Gun Position may fire.



In the Basic Game Rules, all planes have a 12 o'clock Level arc for the Play of their Guns. Additional information is given in the Advanced Game Rules.

(16) VARIANT GUN CHARACTERISTICS: Alternate armaments (if any) are displayed. The same format as the Plane Gun Characteristics Chart is used. Additional information regarding the Variant is listed above this Chart. Note that some large planes have no Variant Gun Characteristics, but, instead, have an expanded Plane Gun Characteristics Chart. No Variants are used in the Basic Game Rules, the information being given in the Advanced Game Rules.

(17) STRATEGIC GAME INFORMATION: With the exception of the "Glide" information (covered in the Optional Rules), this section of the Data Cards is not explained in this rulebook. This section will be explained when the second game in this series is published.

(18) MASS GAME INFORMATION: This information is used *only* for games played using the Mass Game Rules, and is explained in that part of the rulebook.

SET UP AND PREPARATION FOR PLAY

I. SCENARIO AND SIDE SELECTION

A. SCENARIO SELECTION: Select a scenario from the Scenario section of this rulebook. All the specific information necessary for set up is listed in the scenarios. For a *first* game, Scenario 1A is suggested, if the game is played solitaire, or Scenario 2A, if an opponent is available.

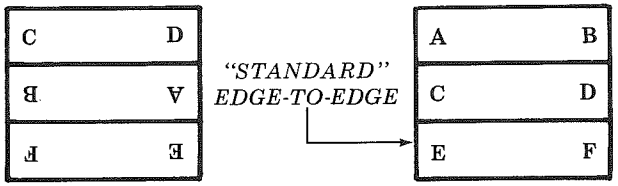
B. DETERMINING SIDES: Which player will be on which side is never determined until after the mapboard is set up. The Sequence of Scenario Set Up and information on how to determine sides is covered in the Scenario section of this rulebook.

II. MAPBOARD SET UP

A. PLAYING AREA: *WINGS* can be played on any smooth level surface, but a large table is best. There should be room on the table for the mapboard and all other needed game components to be spread out properly.

B. MAPBOARD SECTION PLACEMENT: There are two basic ways in which the mapboard sections may be placed together to form the full mapboard for the start of a game.

1. EDGE-TO-EDGE: The mapboard sections are placed together so that their longer sides are touching. Sample Edge-to-Edge mapboard set ups are shown below:



2. END-TO-END: The mapboard sections are placed together so that their shorter sides are touching. A sample End-to-End mapboard set up is shown below:

C. TERRAIN AND TARGET UNIT PLACEMENT: Information telling which of these units are used, and where they should be placed is listed in the individual scenarios. Not all of these units are used in every scenario, and only *general* locations given — *exactly* where these units are to be placed is left to the players. The following system can be used to indicate *exactly* where *any* units are to be placed, but is not employed in the scenarios as exact placement can be very tedious and time-consuming.

1. Each Hill, Woods, Cloud, Railline, and Landing Field unit contains an identifying number code and a Direction Arrow (if multi-hex sized). To list the exact placement of a unit more than one hex in size, list the four-digit hex identification number of the hex in which the part of the unit containing the number is placed, and the direction (referring to the Directional Hexagon in that section of the mapboard) in which the arrow points. *For example, the notation "2111-5" gives the hex number as "2111" and the direction as "5" (based on Directional Hexagon "A", as hex "2111" lies in that part of the mapboard section).*

2. The hex identification number is sufficient for *all* units that occupy only one hex to show their exact locations.

3. To show the exact locations of all other units that occupy more than one hex, but have no arrow printed on them, *all* hex numbers that the unit occupies must be noted.

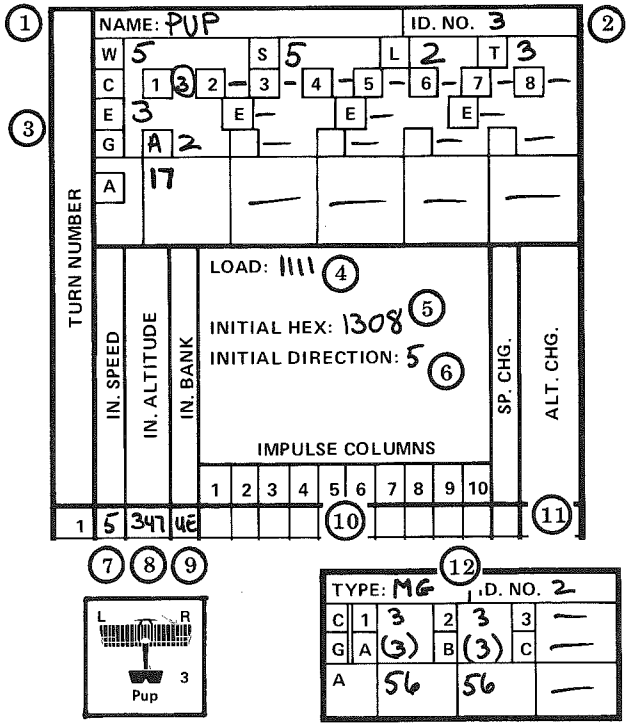
4. MULTI-LEVEL HILLS: Hill terrain units may be stacked one on top of another (always smaller units on top of larger units) to more graphically show their heights. In addition, other units may also be stacked on top of the Hill units. The Altitude Levels of stacked units are added together.

D. COMBAT UNIT PLACEMENT: After determining sides and the Combat units to be used, the needed Data Cards should be obtained for easy reference during the game. Where the units are placed on or enter the mapboard, and their starting altitudes are listed in the individual scenarios. Place Bank units on all Plane units. Place Flexible Gun units on all Plane units that require them (not used in the Basic Game).

E. FINAL PREPARATIONS: Lay out a Command Sheet for each player in a convenient spot where it can be written on, yet concealed from the view of players on the other side. The Game Cards and dice should be laid out in convenient locations for easy use.

III. COMMAND SHEET PREPARATION

The Command Sheets contain a list of Order Notations (not all used in the Basic Game Rules) and other useful information used in plotting orders in the Combat Unit Columns. The primary feature of the Command Sheets are three "Combat Unit Columns". Each Combat Unit Column is used to plot the orders for one Combat unit (normally a Plane unit) on the mapboard. One Combat Unit Column must be filled out for each unit a player will be controlling. The Plane unit and the Combat Unit Column below show a Combat Unit Column correctly filled out for this Plane unit at the start of a game.



(1) NAME: The name of the unit the column is to be used for is placed in the space to the right of the word "Name".

(2) IDENTIFICATION NUMBER: The number of the unit is placed in the space to the right of the words "Id. No.".

(3) HIT RECORD: The Hit Record section is used to record damage to the plane during a game. The numbers and letters written in at this time are copied from the Plane Target Characteristics Chart on the plane's Data Card (for this sample, Data Card 35). The Gun and Ammo information is copied from the Gun Characteristics Chart, including filling in the letters of the Gun Positions. Note: The letter "A" means "Ammunition", "C" means "Crew", and "G" means "Guns".

(4) LOAD: If the plane carries a "Load" (explained in the Optional Rules), it should be listed here. This plane carries four "1" Size Bombs.

(5) INITIAL HEX: If the unit starts on the mapboard, the hex in which it is to be initially placed should be noted here.

(6) INITIAL DIRECTION: The direction in which the unit will face (based on the appropriate Directional Hex) should be noted here.

⑦ INITIAL SPEED: This is the Initial Speed of the plane at the start of the game. This may be any number of Speed Factors that falls into the Level Speed Increment.

⑧ INITIAL ALTITUDE: This is the Initial Altitude of the plane at the start of the game, given in Altitude Levels. This is either given, or methods for determining it are given in the individual scenarios.

⑨ INITIAL BANK: This is the Initial Bank of the plane at the start of the game, given as an appropriate notation. Planes may begin a game in any desired Bank.

⑩ IMPULSE COLUMNS: Each column, called an "Impulse", can be used for plotting orders during the game. Nothing is written in these while the Command Sheets are being prepared.

⑪ SPEED AND ALTITUDE CHANGES: These columns are used for plotting Speed Changes (in the "Sp. Chg." column) and Altitude Changes (in the "Alt. Chg." column) during the game. Nothing is written in these columns while the Command Sheets are being prepared.

⑫ GUN UNIT HIT RECORDS: As explained in the Optional Rules, these are filled out similarly to the Hit Records in the Combat Unit Columns, but are used for Gun units.

THE BASIC GAME RULES

I. INTRODUCTION TO THE BASIC GAME RULES

WINGS is basically a two-player game using a simultaneous system for movement. Each player uses his units to attempt to accomplish the objectives of the scenario being played.

The Basic Game Rules cover the play of *WINGS* in a simple and introductory form, and only a portion of the units included can be used for games using these rules. *WINGS* is a game that requires practice and experience to master. Every Turn, players must check the Initial Speeds, Altitudes, and Banks of their various planes, as well as their previous notations. Checking the information on their Data Cards, the situation must be evaluated and decisions on possible moves made. These decisions are then translated into notations on the Command Sheet. Movement is then made, firing and damage is resolved, and the process begins again for the next Turn. Until this process is mastered, players should stick with the Basic Game.

Not all units and Data Cards are used for games using the Basic Game Rules. Only Data Cards 6, 11, 13, 18, 19, 23, 27, 35, 41, 45, 50, 56, 61, 68, 72, 75, 78, 82, 86, 98, and 100 and the Plane units used with them, and the Zeppelin unit are needed for play using the Basic Game Rules.

II. THE BASIC GAME SEQUENCE OF PLAY

The game starts when all set up and preparation is completed. The game is played in "Turns". The number of Turns in any game varies, depending on the scenario. Each Turn is divided into four "Phases", which must be performed in the sequence listed below.

A. THE ORDER PLOT PHASE: All players secretly write the orders for each of their units for the current Turn on their Command Sheets. This writing of a series of letter and number notations is called "plotting" orders. Each notation indicates specific actions that the unit will perform during the Turn.

B. THE NEW INITIALS PLOTTING PHASE: After the orders for the current Turn are plotted, the new Initial Speed, Initial Altitude, and Initial Bank, which resulted from the plotted orders, are entered in the next line of each unit's Combat Unit Column.

C. THE PLOTTED ORDER EXECUTION PHASE: When all players have finished writing, all units are *simultaneously* moved *exactly* as their orders were plotted in their Combat Unit Columns.

1. Actually trying to move everything at once is usually impractical, so the players may move the units in any convenient order until all are moved.

2. If players wish, Command Sheets may be exchanged prior to moving the units. This is not essential, but does help keep things honest.

3. Any Collisions caused by the movements are resolved during this Phase, after all units have been moved.

D. THE GUNFIRE PHASE: Each player now executes all of his Gunfire. The Gunfire is resolved, all hits are marked, and all destroyed units removed from play.

III. GENERAL GAME PROCEDURES AND RULES

The following all play a part in several different Phases of a Turn. They are grouped together in this section to avoid repetition.

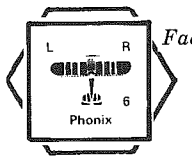
A. READING THE DICE: Two normal, six-sided dice are required to play the game, one colored, and one white.

1. SINGLE DIE: Either die can be rolled when the rules call for a *die* roll. The spots on the die are read normally.

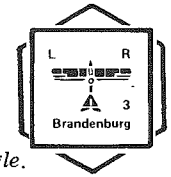
2. TWO DICE: Both dice are rolled whenever a *dice* roll is called for by the rules. When rolled, they are read in the order colored die, white die to form combined numbers from "11" (lowest) to "66" (highest). *For example, if the colored die showed a "6", and the white die showed a "3", the dice number rolled is read as "63".*

3. DICE ROLL MODIFIERS: Whenever a Modifier applies to a dice roll, it always affects only the number rolled on the *colored* die. *For example, if a "4" shows on the colored die, and a "-1" Modifier applies to the dice roll, the colored die roll number would become a "3".*

B. UNIT FACING: The "front" of all Plane units is shown on their Data Cards — the front of each unit faces the top of the Data Card in the Unit Identification picture. The fronts of other units are shown in the Introduction to the Rules, section III.B. Units must at all times be facing towards a definite hex*side*, not towards the angle of a hex. Be very careful with the placement of units with regards to their facing, especially when more than one unit is present in the same hex, so that no chances for confusion exist.



CORRECT
Facing a Hexside.

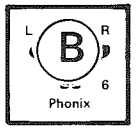


INCORRECT
Facing a Hex Angle.

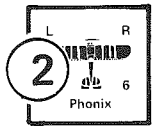
C. STACKING — UNITS PER HEX LIMITATIONS: Each hex is considered to be many thousands of feet in depth. Any number of "flying" planes may occupy the same hex at the same time, as long as each unit is at a different Altitude Level — units at the same Altitude Level will Collide. For units on the surface, there are no limits on the number of units that may occupy the same hex at the same time, and they do *not* Collide.

D. BANK UNITS: Even though Plane units have their Bank Attitudes recorded on their Command Sheets, it is a useful visual aid to place Bank units on top of the Plane units to show their current Bank Attitudes. Bank units are used to indicate Bank Attitudes as follows:

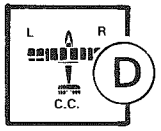
UPRIGHT LEVEL BANK



UPRIGHT LEFT BANK

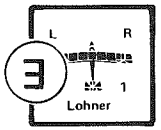


UPRIGHT RIGHT BANK

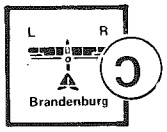


Note that the Bank units are right-side-up, and the tops of the numbers or letters on the Bank units are towards the front of the Plane units.

PERPENDICULAR LEFT BANK

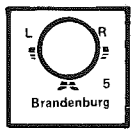


PERPENDICULAR RIGHT BANK

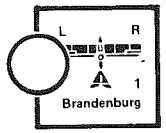


Note that the Bank units are right-side-up, and that the numbers or letters on the Bank units are towards the back of the Plane units.

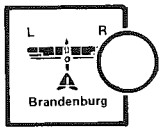
INVERTED LEVEL BANK



INVERTED LEFT BANK



INVERTED RIGHT BANK



Note that the Bank units are inverted (upside-down).

E. CONTROLLING PLAYER DEFINITION: A player *always* performs all moves and dice rolls for the units of the side he commands. Thus, a player is *always* the "controlling player" for his own units.

IV. THE ORDER PLOT PHASE — HOW TO MOVE

All planes are considered to be moving simultaneously when movement is executed. The orders for each unit must be secretly plotted in its Combat Unit Column before any orders are actually executed. Players should mark on their Command Sheets in pencil to facilitate erasing. Carefully check over the plotted orders to ensure their correctness after all notations are written.

A. GENERAL RULES OF MOVEMENT: Plane units may move from hex to hex and from one Altitude Level to another, within the rules restrictions.

1. GROUND ALTITUDE LEVEL: In the Basic Game, the Ground Altitude Level is always considered to be "0". Therefore, planes must move at Altitude Level "1" or above at all times to be considered to be "flying".

2. INITIAL ALTITUDE EFFECTS ON MOVEMENT: The numbers found on the same line with the plane's Initial Altitude on the Plane Movement Characteristics Chart on the Data Card are the ones used during the Turn, even if gaining or losing Altitude Levels during the Turn would shift the plane's altitude onto a new line.

3. ALTITUDE LEVELS: The mapboard provides a two-dimensional playing surface that players must visualize as having "depth". For game purposes, this depth is divided into "Altitude Levels". Planes move from an Altitude Level to an adjacent Altitude Level. *For example, a Plane unit at Altitude Level "100" could go up one Altitude Level to "101", or down one Altitude Level to "99".*

4. SPEED FACTORS: Each plane has a number of "Speed Factors" to expend during the course of a Turn. The number of Speed Factors available during a Turn is equal to the plane's Initial Speed for that Turn. Speed Factors are expended as new hexes are entered and/or as Maneuvers are executed.

a. One Speed Factor is expended per new hex entered.

b. One Speed Factor is expended in certain Maneuvers (i.e. turns), even if no new hex is entered.

c. Orders must be plotted so that *all* Speed Factors of a plane's Initial Speed are expended during the Turn, either by entering new hexes, by performing Maneuvers, or any legal combinations of these.

d. One order notation indicating the expenditure of one Speed Factor is plotted in each Impulse Column. Thus, the number of Impules used to plot orders for a Turn will be the same as the number of Speed Factors noted in the Initial Speed Column. *For example, if the Initial Speed is "5", orders must be plotted in Impulse Columns "1", "2", "3", "4", and "5".*

5. GENERAL MOVEMENT RESTRICTIONS: Planes may be moved in any direction or combination of directions and/or change Altitude Levels, as long as the Speed Factors are available to make the movement, and legal Maneuvers allow the movement.

a. Movement from hex to hex, and from Altitude Level to Altitude Level must be consecutive — a unit may not skip hexes or Altitude Levels.

b. A plane is always moved either into the hex it faces, or, in the case of some Maneuvers, into some specific hex based on where the Plane unit faces.

c. A plane may *never* be moved such that its Initial Speed for the following Turn will be "0", or less.

B. SPEED INCREMENTS: The three columns falling under the "Speed Increments" section show the three different Speed Increments for the plane. The numbers listed in these columns show the range of Speed Factors falling in each Speed Increment. A Plane unit's Initial Speed at the start of a Turn determines which of these Speed Increments will be used in plotting orders for the plane.

1. STALL SPEED: This is the lowest Speed Increment. Plane units with an Initial Speed falling in this range lack the lift to maintain normal "flight". The highest number in this Speed Increment is the plane's Maximum Stall Speed. Since the lift for normal flight is absent, planes moving at Stall Speed will "stall", and perform a "Spin Maneuver". In a Spin Maneuver, a plane uncontrollably falls earthward while spinning rapidly. Procedure for a Spin Maneuver is as follows:

a. Plot the Spin Maneuver notation ("SP") in the appropriate number of Impulse Columns in the plane's Combat Unit Column. *For example, if the Initial Speed is "2", the order is plotted as follows:*

1	2	3
SP	SP	

A plane in a Spin Maneuver must also be plotted to Dive at its Maximum Dive Rate for the Initial Altitude. The increase in speed from this Dive is what will eventually end the Spin Maneuver. Power or Brake Factors may be applied during a Spin Maneuver, if desired.

b. To execute a Spin Maneuver, move the plane unit straight forward the number of hexes equal to its Initial Speed. Then roll one die — the number rolled is the number of hexsides the front of the Plane unit must be turned through. The Plane unit is turned to the right if it is in one of the Right Bank Attitudes, to the left if it is in one of the Left Bank Attitudes, and in the direction of the controlling player's choice if it is in one of the Level Bank Attitudes.

2. LEVEL SPEED: This is the middle Speed Increment. Plane units with an Initial Speed falling in this range are at normal flight speeds. Planes moving at Level Speed perform Maneuvers based on the numbers listed in the "Level" columns under each Maneuver.

3. DIVE SPEED: This is the highest Speed Increment. Plane units with an Initial Speed falling in this range are using gravity to exceed normal flight speeds. The highest number in this Speed Increment is the plane's "Maximum Dive Speed". Planes moving at Dive Speed perform Maneuvers based on the numbers listed in the "Dive" columns under each Maneuver. Planes whose Initial Speed falls in the Dive Speed Increment must, during the Turn, be Dived at least three Altitude Levels (enough to increase speed, although this can be counteracted by Brake Factors or expended in Maneuvers), or be made to decrease speed into a lower Speed Increment.

C. SPEED CHANGES — POWER AND BRAKE FACTORS: The two columns falling under the "Speed Changes" section show the plane's ability to increase or decrease speed during a Turn. The Initial Speed of a plane must be held to between "1" and its Maximum Dive Speed. Power and Brake Factors are often needed to hold speeds in this range. Power and Brake Factors may not be accumulated from Turn to Turn, and the listed numbers are available for use *every* Turn.

1. GENERAL SPEED CHANGE RULES: The Initial Speed of a plane may be increased as a result of Diving or the use of Power Factors. It may be decreased as a result of Climbing, the use of Brake Factors, or the performance of certain Maneuvers. All of these Speed Changes apply only for computing the Initial Speed for the *following* Turn; they have no effects on the current Turn being plotted.

2. POWER FACTORS: Power Factors (notation "P") may be used to compensate for Speed Factors that would be lost through Climbing or Maneuver, or to increase speed for the following Turn. Power Factors for a plane whose new Initial Speed would fall in the Dive Speed Increment may not be plotted unless the plane is also plotted to Dive at least three Altitude Levels during the same Turn. Each Power Factor adds one Speed Factor to the plane's new Initial Speed. The number of Power Factors plotted during any Turn may not exceed the number listed (this number may also be reduced through damage).

3. BRAKE FACTORS: Brake Factors (notation "B") may be used to compensate for Speed Factors that would be gained through Diving, or to decrease speed for the following Turn. Each Brake Factor subtracts one Speed Factor from the plane's new Initial Speed. The number of Brake Factors plotted during any Turn may not exceed the number listed (this number may also be reduced through damage).

4. CUMULATIVE SPEED CHANGES: All Speed Changes are cumulative, and are applied to the following Turn's Initial Speed. *For example, a plane with an increase of two Speed Factors and a decrease of three Speed Factors from all causes would have a cumulative speed loss of one Speed Factor.* Brake and Power Factors may never both be used by a plane during the same Turn.

D. ALTITUDE CHANGES — DIVING AND CLIMBING: The three columns falling under the "Altitude Changes" section show the plane's ability to change its altitude during a Turn. The "Zoom Climb" column is not used in the Basic Game — its use is explained in the Advanced Game Rules. A plane may never Climb *and* Dive during the same Turn. Climb and Dive Rate numbers may not be accumulated from Turn to Turn.

1. THE CLIMB RATE COLUMN: This column displays the information needed to gain altitude.

a. CLIMB RATE FRACTION: The fraction at the top of the column shows how much speed is lost when the plane Climbs. *For example, "1/2" indicates that the plane will lose one Speed Factor for every two Altitude Levels Climbed.* This speed loss also occurs if only a portion of this change is made. *For example, a plane with a Climb Rate Fraction of "1/3" will lose one Speed Factor if one, two, or three Altitude Levels are Climbed. If four Altitude Levels were Climbed with this plane, two Speed Factors will be lost.*

b. NORMAL CLIMB RATE: The numbers found in the column show the number of Altitude Levels the plane can normally Climb during one Turn. A plane may Climb less than the number of Altitude Levels listed. *For example, a "3" indicates that the plane may Climb up to three Altitude Levels per Turn.* If the Normal Climb Rate is a fraction, the plane climbs less than one Altitude Level per Turn. *For example, a "1/3" indicates that the plane may Climb one Altitude Level only during every third Turn since its last Climb.*

2. THE DIVE RATE COLUMN: This column displays the information needed to lose altitude.

a. DIVE RATE FRACTION: The fraction at the top of the column shows how much speed is gained when the plane Dives. All planes have a fraction of "1/3". This indicates that the plane will gain one Speed Factor for every three Altitude Levels Dived. This speed gain does *not* occur if only a portion of this change is made. *For example, no Speed Factors are gained if only one or two Altitude Levels are Dived. If three, four, or five Altitude Levels are Dived, only one Speed Factor is gained, etc.*

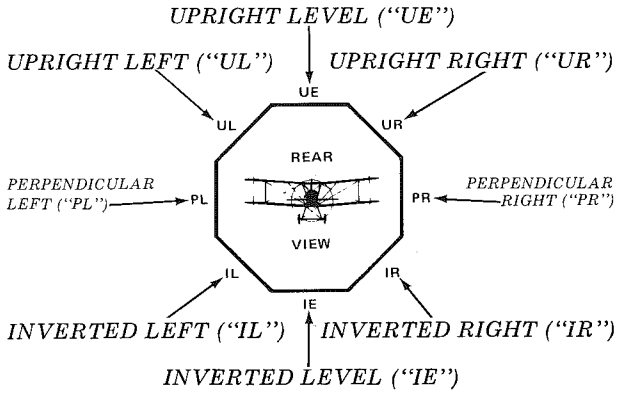
b. DIVE RATE: The numbers found in the column show the maximum number of Altitude Levels the plane can Dive during any one Turn, or its "Maximum Dive Rate". A plane may Dive less than the number of Altitude Levels listed.

E. BASIC MANEUVERS: The three Maneuvers falling under the "Basic Maneuvers" section show the Maneuvers that a plane can perform under the Basic Game Rules. Collectively, all the Maneuvers discussed here are called "Basic Maneuvers". The numbers listed in each column show the *minimum* number of hexes that a plane must enter before executing a Maneuver. The plane may be plotted to enter *more* hexes than the minimum number listed. A number in the Level or Dive column is used depending on the Speed Increment into which the plane's Initial Speed falls. All Maneuvers are plotted in the Impulse Columns through the use of dashes, numbers, and letter notations. The number of hexes to be entered in order to perform a Maneuver must all be moved prior to writing the Maneuver number or letter notation. A Maneuver started on one Turn may be completed on a later Turn.

1. STRAIGHT AHEAD MANEUVER: A "1" indicates that the plane will enter the next hex directly in front of the Plane unit. This notation can be repeated for as many hexes as the plane is to be moved Straight Ahead. No hexes need be entered prior to plotting this Maneuver, and it can be performed while in any Bank Attitude. Each Straight Ahead Maneuver expends one Speed Factor, but causes no loss of Speed Factors to the next Turn's Initial Speed.

2. BANK MANEUVERS: A plane can make a Bank Maneuver either to the left ("BL") or to the right ("BR"). A Bank Maneuver will change the plane's Bank Attitude. The information for this Maneuver is found in the "Bank" columns on the Data Cards. There are eight "Bank Attitudes". The Bank Attitude of a plane can determine what other Maneuvers it can perform. Viewed from behind, the Bank Attitudes, with their abbreviations, are as follows:

BANK ATTITUDE DIAGRAM



The Upright Left, Upright Right, and Upright Level Bank Attitudes are all collectively called "Upright Bank Attitudes".

The Perpendicular Left and Perpendicular Right Bank Attitudes are both collectively called "Perpendicular Bank Attitudes".

The Inverted Left, Inverted Right, and Inverted Level Bank Attitudes are all collectively called "Inverted Bank Attitudes".

The Upright Left, Perpendicular Left, and Inverted Left Bank Attitudes are all collectively called "Left Bank Attitudes".

The Upright Right, Perpendicular Right, and Inverted Right Bank Attitudes are all collectively called "Right Bank Attitudes".

The Upright Level and Inverted Level Bank Attitudes are both collectively called "Level Bank Attitudes".

a. To indicate a Bank Maneuver, the plane must be plotted with the required number of dashes, followed by the Bank Maneuver notation. If the required number of dashes is "0", then no dashes need preceed the Bank Maneuver notation, although the Plane unit must still be moved forward one hex while performing the Maneuver.

b. A plane that performs a Bank Maneuver will be changed to an adjacent Bank Attitude. *For example, a plane in an Upright Left Bank Attitude ("UL") that performs a Bank Right Maneuver ("BR") will end in an Upright Level Bank Attitude ("UE"), as that is the next Bank Attitude to the right on the Bank Attitude Diagram.*

c. A plane can always make either a Bank Left or Bank Right Maneuver, regardless of its current Bank Attitude.

d. A Bank Maneuver notation expends one Speed Factor, but causes no loss of Speed Factors to the next Turn's Initial Speed.

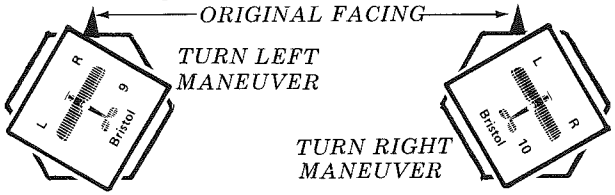
3. TURN MANEUVERS: A plane can make Turn Maneuvers either to the left ("TL") or to the right ("TR"). A Turn Maneuver will change the direction in which the plane faces. The information for this Maneuver is found in the "Turn" columns on the Data Cards.

a. A plane must be in one of the Right Bank Attitudes to perform a Turn Right Maneuver. A plane must be in one of the Left Bank Attitudes to perform a Turn Left Maneuver. Planes in one of the Level Bank Attitudes may *not* perform a Turn Maneuver.

b. A plane that performs a Turn Maneuver will have the front of the Plane unit changed to face a hexside adjacent to its original facing.

c. To indicate a Turn Maneuver, the plane must be plotted with the required number of dashes, followed by the Turn Maneuver notation.

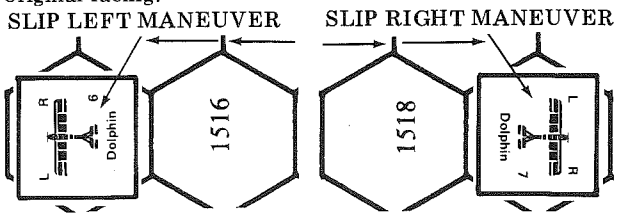
d. A Turn Maneuver notation expends one Speed Factor, and causes the loss of one Speed Factor to the next Turn's Initial Speed.



4. SLIP MANEUVERS: A plane can make Slip Maneuvers either to the left ("SL") or to the right ("SR"). A Slip Maneuver will cause the plane to shift its position to one side of its current course. The information for this Maneuver is found in the "Slip" columns on the Data Cards.

a. A plane must be in one of the Right Bank Attitudes to perform a Slip Right Maneuver. A plane must be in one of the Left Bank Attitudes to perform a Slip Left Maneuver. Planes in one of the Level Bank Attitudes may *not* perform a Slip Maneuver. Also, during a Turn in which a Slip Maneuver is performed, the plane must be plotted to Dive at *least* three Altitude Levels per Slip Maneuver performed.

b. A plane that performs a Slip Maneuver will be shifted into an adjacent hex (see diagram below), and retain its original facing.



c. To indicate a Slip Maneuver, the plane must be plotted with the required number of dashes, followed by the Slip Maneuver notation. Also, be sure to plot a Dive of at least three Altitude Levels.

d. A Slip Maneuver notation expends one Speed Factor, and causes the loss of one Speed Factor to the next Turn's Initial Speed.

F. ORDER NOTATIONS: Each player uses a Command Sheet or Sheets for plotting the orders of the planes he controls. A system of notations is used in marking these orders. Notations marked "A" (Advanced Game), "OP" (Optional Rules), or "D" (Duel Game) in parenthesis are not used in the Basic Game. All players must learn and use this notation system, so that any other player that examined the Command Sheet could understand the orders.

1. MOVEMENT ORDERS: The Movement Orders for each plane are plotted in the "Impulse Columns" section of each Combat Unit Column.

a. There are ten numberd Impulse Columns. Each Impulse Column is used to mark a notation that shows the expenditure of one Speed Factor. The number of Impulse Columns used during a Turn should equal the plane's Initial Speed for the Turn. Excess Impulse Columns are left blank.

b. Dashes ("–") are used to mark required hexes prior to marking the Maneuver notation. For all Basic Maneuvers, each dash is executed as a move directly forward into the next hex. *For example, if a plane had a "3" for a Turn number, and a Turn Right Maneuver is plotted, it would be marked as below:*

FOUR IMPULSE COLUMNS HAVE BEEN USED.

–	–	–	TR

c. Whenever dashes are plotted, the Maneuver notation must be plotted at the same time, even if it will take place during a later Turn.

d. A dash notation expends one Speed Factor, but causes no loss of Speed Factors to the next Turn's Initial Speed.

2. ALTITUDE CHANGES: The Altitude Change Orders for each plane are plotted in the "Alt. Chg." column of each Combat Unit Column.

a. Combine a Climb or Dive notation with the number of Altitude Levels to be changed. *For example, the notation "D3" would order a Dive of three Altitude Levels.*

b. Mark "0" if no changes are ordered.

3. SPEED CHANGES: The Speed Change Orders for each plane are plotted in the "Sp. Chg." column of each Combat Unit Column.

a. Combine a Power or Brake notation with the number of these Factors to be used. *For example, the notation "B2" would order the use of two Brake Factors.*

b. Mark "0" if no Power or Brake Factors are used.

V. THE NEW INITIALS PLOTTING PHASE

After a plane's orders are plotted, the effects of these orders on a new Initial Speed, Initial Altitude, and Initial Bank for the next Turn must be calculated. These will apply to the plane after its orders are executed, as well as providing essential information for the plotting of the next Turn's orders. These "New Initials" are written on the line for the *next* Turn.

A. NEW INITIAL SPEED: Calculate by subtracting all speed losses and adding all speed gains to the previous Turn's Initial Speed.

B. NEW INITIAL ALTITUDE: Calculate by subtracting all Altitude Levels lost through Diving, or by adding all Altitude Levels gained through Climbing to the previous Turn's Initial Altitude.

C. NEW INITIAL BANK: Calculate by comparing any Banking Orders plotted to the previous Turn's Initial Bank.

VI. THE PLOTTED ORDER EXECUTION PHASE

During this Phase, the Plane units must be moved *exactly* as their orders were plotted. If the players are exchanging Command Sheets, this should be done before any units are moved. If not exchanged, the Command Sheets should at least be laid out in full view. Although the movement is considered to be simultaneous, one player should move, then another, etc., in any convenient order. This allows one player to check moves while the other makes them, and helps accuracy. Continue until all units have been properly moved.

A. COLLISIONS: Possible Collisions are checked after all movement has been made, including adjustments for illegal orders.

1. COLLISION WITH THE GROUND: Any plane found to be at an Altitude Level of "0", or less, has crashed into the earth and is destroyed and removed from play.

2. PLANE-TO-PLANE COLLISIONS: After all movement, if two or more Plane units are found to be in the same hex *and* at the same Altitude Level, they are considered to have Collided. They are destroyed and removed from play.

B. ILLEGAL ORDERS: Incorrectly plotted orders will occur occasionally, with notations marked for impossible moves, or problems caused by Gunfire damage. As it is now too late to replot the orders, and they must be changed, the following procedures must be followed to correct the illegal orders. Change movements and notations to reflect the changes.

1. INITIAL SPEED EXCEEDED: Erase all notations plotted in Impulse Columns numbered higher than the Initial Speed number. If this causes a change in a plotted Maneuver that extends into later Turns, erase those notations also. Any plotted dashes that are left without an accompanying Maneuver notation should be changed to a "1". These changes may also cause changes to the New Initials for the next Turn.

2. CLIMB OR DIVE RATE EXCEEDED: Adjust the Climb or Dive notation to the maximum legal Rate, and adjust the next Turn's Initials as needed.

3. MANEUVER IMPROPERLY PLOTTED: If a plane is plotted with insufficient dashes to execute a Maneuver, or an impossible Maneuver is plotted (i.e. a Turn Right orders plotted while in one of the Left Bank Attitudes, or a Slip Maneuver plotted without the required Dive), change all the dashes and the illegal Maneu-

ver notation to a "1". Adjust the next Turn's Initials as needed.

4. POWER OR BRAKE FACTORS EXCEEDED: Adjust the Power or Brake notation to the maximum legal number, and adjust the next Turn's Initials as needed.

5. INITIAL SPEED UNDER-USED: Add a "1" in all Impulse Columns that contain no notations that are numbered as high as the Initial Speed number.

6. MAXIMUM DIVE SPEED EXCEEDED: This can result from changes in Initials or be due to damage that reduced the Maximum Dive Speed, or put two hits on the Pilot. The plane is destroyed and removed from play.

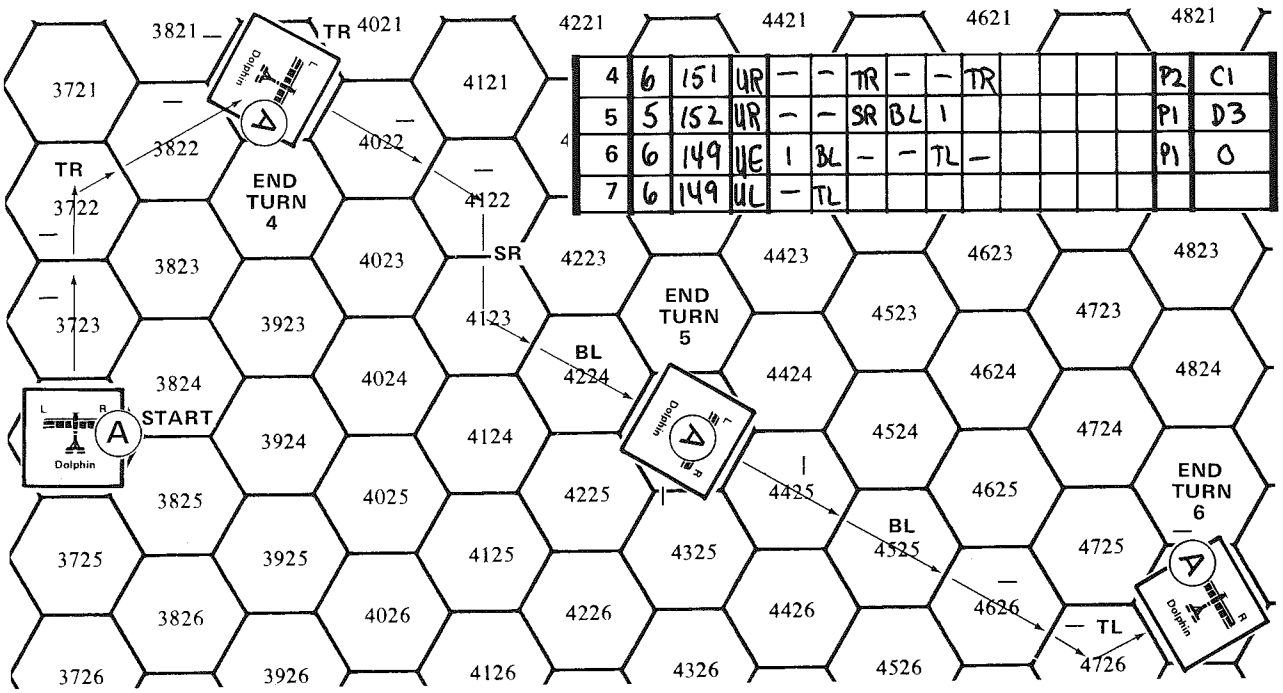
7. INITIAL SPEED OF "0" OR LESS: Adjustments to Initials can cause this. The plane is destroyed and removed from play.

C. BANK UNIT ADJUSTMENT: Adjust the Bank units on the planes to show any changes in their Bank Attitudes.

D. SAMPLE ORDER NOTATIONS AND ORDER EXECUTION: A number of sample Turns are plotted below, along with the movement this would cause on the mapboard. Comments on each Turn are given below.

TURN FOUR: The plane moves forward two hexes and performs a Turn Right Maneuver; it then moves forward two more hexes and again performs a Turn Right Maneuver. One Altitude Level is Climbed, and two Power Factors are used. The two Turn Right Maneuvers and the Climb each cause a loss of one Speed Factor, but the two Power Factors counteract two of these losses. Thus, the new Initial Speed is one less than the previous one. The new Initial Altitude is one Altitude Level higher than the previous one, thanks to the Climb. There is no change in the Bank Attitude.

TURN FIVE: The plane moves forward two hexes and performs a Slip Right Maneuver; it then moves forward one hex while performing a Bank Left Maneuver; movement ends with a Straight Ahead Maneuver as an additional hex is entered. Three Altitude Levels were Dived, as this was required to perform the Slip Maneuver, and one Power Factor is used. The Slip Right Maneuver causes the loss of one Speed Factor, but the Dive and the one Power Factor add one Speed Factor each, for a net gain of one Speed Factor. Thus, the new Initial Speed is one more than the previous one. The new Initial Altitude is three Altitude Levels lower than the previous one, thanks to the Dive. The Bank Attitude has shifted one to the left, to an Upright Level Attitude, and the Bank unit is moved accordingly.



4	6	151	UR	—	—	TR	—	—	TR					P2	C1
5	5	152	UR	—	—	SR	BL	1						P1	D3
6	6	149	UE	1	BL	—	—	TL	—					P1	0
7	6	149	UL	—	TL										

TURN SIX: The plane moves Straight Ahead one hex; it then moves forward another hex while performing a Bank Left Maneuver (this Maneuver shifts the Bank Attitude to an Upright Left Attitude, and the Bank unit is moved); it then moves forward two more hexes and performs a Turn Left Maneuver (legal with the new Bank Attitude); the Turn ends with another hex entered as the start of another Turn Left Maneuver that will not be performed until the second Impulse of Turn Seven. The new Initials are calculated normally, and note that there is no speed loss for the second Turn Left Maneuver, as it is not executed during Turn Six. It will cause a speed loss during Turn Seven, and will, therefore, affect the Initial Speed for Turn Eight.

VII. THE GUNFIRE PHASE — HOW TO FIRE — THE MARKING AND EFFECTS OF HITS

After all plotted orders have been executed, players have the opportunity to engage in combat by firing their plane's Guns, if possible. During this Phase, Gunfire is resolved and damage marked.

A. GUNFIRE DETERMINATION: The Initials for the next Turn apply when Gunfire is resolved. All Gunfire is considered to be simultaneous, although it can be resolved in any convenient order — simply ignore the effects of hits until all Gunfire is completed for the Turn. A plane firing its Gun or Guns is called the "firing unit", and the unit at which the Gunfire is directed is called the "target unit". Gunfire Determination is used to decide if firing is possible.

1. GENERAL RULES OF GUNFIRE DETERMINATION: Players do not have to fire, but normally will wish to do so whenever a target unit is available. This is a voluntary decision by the controlling player.

a. A plane may *not* fire if the notation in its *last* marked Impulse Column is a dash.

b. Gunfire must be directed at the *nearest* target unit that can be fired at. If more than one possible target unit could be considered as the nearest (i.e., the Range is equal), the controlling player for the firing unit may choose which will be the target unit. A friendly plane or planes in the Gun Play, and between the firing unit and the target unit do *not* block the firing.

c. Firing is only possible if the target unit lies within both the Gun Play and Gun Range of the firing unit.

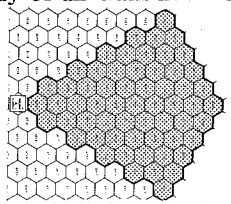
d. All planes fire individually. Bursts from a number of different planes may not be added together for one single shot. A single plane may fire only once per Turn, and may be used to fire at only one single target unit per Turn.

e. Two or more planes may fire separately at the same target unit during the same Turn. However, all planes that will be used to fire at the *same* target unit must be announced prior to any firing at that target unit being

resolved. Once announced, the target may not be changed, even if the target unit is destroyed before all announced planes have resolved Gunfire against it.

2. BASIC GUN PLAY: All planes used in the Basic Game are considered to have "Fixed Machineguns" with a "12 o'clock Level" arc as their Gun Play. These Guns may be used only against target units that fall into this arc, although, for the Basic Game, the target unit may be located at any Altitude Level that is in Range. For the Basic Game, treat Slide Machineguns as if they were Fixed Machineguns. The Gun Play of all Guns in the Basic Game is shown below:

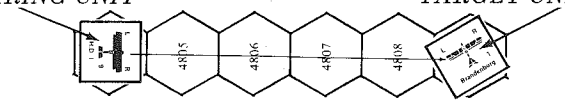
NOTE THAT A TARGET UNIT IN THE SAME HEX AS THE FIRING UNIT MAY NOT BE HIT.



3. GUN RANGE: The Ranges of all Guns is given on the Data Cards. These Guns may be used only against target units that fall within their Range. If a target unit is in the Range of some Guns, but not of other Guns on the same plane, only the Guns with enough Range can be used for the Gunfire.

a. HEX RANGE: Hex Range to a target is determined by counting the number of hexes to the target unit by the shortest possible route, including the hex occupied by the target unit, but not including the hex occupied by the firing unit. *For example, below is shown a Hex Range of five hexes:*

FIRING UNIT *TARGET UNIT*



b. ACTUAL RANGE: The Actual Range is a combination of both the Hex Range, and the difference in altitude between the firing and target units. To find the Actual Range, the *Range Finder Chart* on the Game Card is used, as follows:

(1) Calculate the Altitude Difference between the firing and target units. *For example, if the firing unit is at Altitude Level "115", and the target unit is at Altitude Level "100", the Altitude Difference is 15 Altitude Levels.*

(2) Now use the *Range Finder Chart.* Crossgrid the "Hex Range" with the Altitude Difference ("Alt. Diff."). The number found in the Chart is the Actual Range. *For example, if the Hex Range is "5", and the Altitude Difference is "13", the Actual Range is "6".*

B. GUNFIRE PROCEDURE: Once it has been determined that Gunfire is possible, the following procedure is followed to resolve it:

1. GUN VALUE: Gun Value is calculated in "bursts". Add together all of the bursts that can be fired. *For example, an Albatros D. III (Data Card 72) has Guns of Value "3-3", or a total of six bursts.* This total number of bursts from one plane constitutes a single "shot".

2. BASIC HIT TABLE NUMBER: Consult the *Gunnery Tables* on the Game Card. For the Basic Game, only the "Fixed Air" section is used. In the "Fixed Air" section, crossgrid the total number of bursts in the shot (found in the "Total Bursts Fired" column) with the Actual Range (along the top of this section). The number found is the "Basic Hit Table Number". *For example, six bursts fired at an Actual Range of "5" gives Basic Hit Table "10".*

3. BASIC GAME HIT TABLE MODIFIERS: Now check the *Hit Table Modifiers* on the Game Card, ignoring all Advanced Game (A) and Optional Rule (OP) Modifiers, as these are not used in the Basic Game. These Modifiers are variables that can increase or decrease the Basic Hit Table Number. These Modifiers are cumulative, and are added together to produce a "Total Modifier Number". *For example, a plane firing while inverted ("-4" Modifier) fires at a target Plane unit with a Size Modifier of "+1". The Total Modifier Number is "-4" + "+1" equals "-3".* The Hit Table Modifiers used in the Basic Game are explained as follows:

a. SIZE MODIFIER: This number is found on the *target* unit's Data Card (in the Size Modifier section), and reflects the size of the target. It is always "0" or some positive number.

b. FIRING WHILE INVERTED: If the firing plane is in an Inverted Bank Attitude, a "-4" Modifier applies to the shot.

c. FIRING WHILE PERPENDICULAR: If the firing plane is in a Perpendicualr Bank Attitude, a "-2" Modifier applies to the shot.

d. PER FIRING CREW HIT: For *each* hit previously scored on the Crewman who is firing (always the lone Pilot in the Basic Game), a "-2" Modifier applies to the shot. *For example, if the firing Crewman had one hit, there would be a "-2" Modifier, and if the firing Crewman had two hits, there would be a "-4" Modifier.*

4. THE FINAL MODIFIER NUMBER — USE OF THE MODIFIER CHART: Consult the *Modifier Chart* on the Game Card. Crossgrid the Total Modifier Number (along the top of the Chart) with the total number of bursts in the shot (found in the "Total Bursts Fired" column). The number found is the "Final Modifier Number". *For example, if the Total Modifier Number is "-3", and six bursts are fired, the Final Modifier Number is "-2".* The Final Modifier Number can be either positive or negative, depending on what the Total Modifier Number was.

5. HIT TABLE NUMBER: The Final Modifier Number is added to or subtracted from the Basic Hit Table Number, the result being the Hit Table Number. *For example, if the Basic Hit Table Number is "10", and the Final Modifier Number is "-2", the Hit Table Number is 10 - 2 equals Hit Table Number "8".*

6. USING THE HIT TABLES: Consult the *Hit Tables* on the Game Card. Find the column headed by the Hit Table Number, and roll the two dice. Crossgrid the number rolled with the correct Hit Table column to find the hits scored on the target unit. *For example, if Hit Table "8" is used, and a "22" is rolled on the dice, the hits scored would be "EGST".* The letters appearing in the Hit Tables indicate the following hits: C = Crew; E = Engine; F = Fire; G = Gun; L = Fuel; S = Structure; T = Controls; W = Wings.

C. MARKING HITS: The hits scored are taken from the Hit Tables on the Game Card. Each hit is marked in the target unit's Combat Unit Column on the Command Sheet. Each hit is marked next to the appropriate section of the plane's Hit Record by drawing a vertical line in the space. *For example, a plane with two Wing hits is marked as follows:*

A Gun hit is marked by crossing off the Gun Value number:

D. BASIC GAME DAMAGE EFFECTS: Only the Damage Effects that apply during games using only the Basic Game Rules are covered below. Additional Damage Effects are covered in later sections of the rules. For reference ease, all these Damage Effects are summarized in the *Effects of Hits Chart* on the Set Up Card.

1. BASIC GAME WING HITS: These hits represent damage to the structural integrity of a plane's wing structure and/or struts and bracing wires.

a. When the number of Wing hits equals or exceeds the Wing ("W") number found on a traget's Plane Target Characteristics Chart on its Data Card, the plane is destroyed and removed from play.

b. For every two Wing hits scored, short of destruction, the plane's Maximum Dive Speed is reduced by one. *For example, a plane with a Maximum Dive Speed of "9" that had four Wing hits could not exceed a speed of "7".* Wing hits can reduce the Maximum Dive Speed to the point where the Dive Speed Increment disappears, and reductions start on the maximum allowable Level Speed.

c. For each Wing hit scored, short of destruction, the plane's Brake Factor is reduced by one. If the number of Wing hits equals or exceeds the number of Brake Factors, the Brake Factor for the plane is considered to be "0".

2. BASIC GAME STRUCTURE HITS: These hits represent damage to the structural integrity of a plane's fuselage structure, bracing wires, and/or attachment points. When the number of Structure hits equals or exceeds the Structure ("S") number found on a target's Plane Target Characteristics Chart on its Data Card, the plane is destroyed and removed from play.

3. BASIC GAME FUEL HITS: These hits represent damage to the plane's fuel tanks and/or fuel lines. When the number of Fuel hits equals or exceeds the Fuel ("L") number found on a target's Plane Target Characteristics Chart on its Data Card, the plane is destroyed and removed from play.

4. BASIC GAME CONTROL HITS: These hits represent damage to the plane's flying controls, control wires, and/or control surfaces.

a. When the number of Control hits equals or exceeds three, the plane is destroyed and removed from play.

b. For each Control hit ("T") scored, short of destruction, the plane is required to enter an additional hex before performing any Basic Maneuver. *For example, a plane with a normal Turn number of "2" with one Control hit, would be required to enter a minimum of three hexes before a Turn Maneuver could be performed.*

5. BASIC GAME CREW HITS: These hits represent the wounding or unnerving of a Crewman — in the Basic Game, this Crewman is always the Pilot.

a. When the number of Crew hits equals or exceeds three on an individual Crewman, that Crewman is eliminated. In the Basic Game, all planes have only one Crewman, and his elimination will cause the plane to also be destroyed and removed from play.

b. For each Crew hit ("C") scored, short of elimination, a "-2" Modifier applies for firing.

c. A Crewman with two Crew hits that is in the Dive Speed Increment will "pass out", and be eliminated. In the Basic Game, this elimination will cause the plane to be destroyed and removed from play.

6. BASIC GAME ENGINE HITS: These hits represent damage to the plane's engine, propeller, radiator, and/or engine mountings.

a. When the number of Engine hits equals or exceeds three on an individual Engine, that Engine is eliminated. In the Basic Game, all planes have only one Engine, and its elimination will cause the plane to also be destroyed and removed from play.

b. For each Engine hit ("E") scored, short of elimination, on a single-engine plane, the plane's Power Factors are reduced by one. If the number of Engine hits equals or exceeds the number of Power Factors, the Power Factor is treated as "0".

7. BASIC GAME GUN HITS: These hits represent damage to the plane's Guns, ammunition, and/or Gun mountings that render them inoperable.

a. Each individual Gun is represented by a number that gives its Gun Value in bursts. One of these Gun Value numbers is crossed off for each Gun hit ("G"). Once marked off, the Gun is eliminated, and its bursts may no longer be used for firing.

b. If all Guns have been eliminated on a plane, excess Gun hits that are scored are marked as Structure hits instead.

8. BASIC GAME FIRE HITS: These hits represent a plane's catching Fire and burning up. A Fire hit results in the immediate destruction and removal from play of the plane.

E. HIT PRIORITIES: In all cases where parts of a target plane are in different locations on the plane, the part *nearest* the firing plane is always hit first, then, when it is eliminated, the next closest part of that type, etc.

1. This never makes any difference for Wing, Structure, Fuel, or Control Hits.

2. The Crew and Gun Positions Diagrams on the Data Cards are used to help determine the relative positions of Crewmen and Guns. Further, the Crew numbers are listed in their order from the front to the rear of the plane. The Gun Positions, by letter sequence, are also listed in their order from the front to the rear of the plane.

3. The locations of the Engines are stated on the Data Cards.

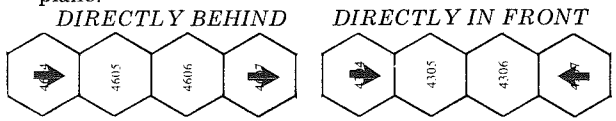
a. If more than one Engine is located on the same side of a plane, the one listed farthest to that side on the Data Sheet would be the first hit (Note: All planes in the Basic Game are single-engined).

b. Pusher Engines are located farthest to the rear of a plane, and Tractor Engines are located farthest to the front of a plane.

c. BASIC GAME ENGINE-CREW HIT PRIORITIES: On planes with Engines that are *not* located in the Wing, the Engine can sometimes provide some protection for Crewmen hidden by its location. By the same token, if a Crewman is between the Engine and the bullets, the Crewman will be hit.

(1) For this to apply, the firing plane must be at the *same* Altitude Level as the target plane, *and* either directly in front of or directly behind the target plane.

DIRECTLY BEHIND *DIRECTLY IN FRONT*



(2) If in front of a target plane with a Tractor Engine, all Crew hits scored are marked as Engine hits. If behind a target plane with a Tractor Engine, all Engine hits scored are marked as Crew hits.

(3) If in front of a target plane with a Pusher Engine, all Engine hits scored are marked as Crew hits. If behind a target plane with a Pusher Engine, all Crew hits scored are marked as Engine hits.

4. If no one part is the *nearest* to the firing plane, the firing player has the choice of exactly which is to be hit.

VIII. BASIC GAME VICTORY CONDITIONS — HOW TO WIN

The Victory Conditions vary with the scenario being played, and are explained in more detail in the individual scenarios. In most scenarios, the side which gains the largest number of Victory Points wins the game. Victory Points are gained by accomplishing a specific mission and/or by eliminating or damaging opposing Combat units. For the Basic Game, Victory Points from opposing Combat units are awarded only for Total Victory Points when an opposing plane is destroyed. No Victory Points are awarded in the Basic Game for damaging opposing planes.

For a first Solitaire game, Scenario 1A is suggested. For a first two-player game, Scenario 2A is suggested.

THE ADVANCED GAME RULES

I. INTRODUCTION TO THE ADVANCED GAME RULES

Players should first master the rules and mechanics of the Basic Game Rules, and play a number of games using them, before trying the Advanced Game. The Advanced Game Rules introduce new concepts and procedures that are absent in the Basic Game. This gives a more complex and detailed game that is much easier to learn and use if the Basic Game Rules are already well-understood by the players.

The Advanced Game Rules, in most cases, simply add to the Basic Game Rules, or supplant certain sections. All Basic Game Rules still apply, unless otherwise stated. All Data Cards and the Plane units used with them are used for the Advanced Game Rules, which still concentrate on air-to-air combat.

II. THE ADVANCED GAME SEQUENCE OF PLAY

The Advanced Game Sequence of Play is the same as the Basic Game Sequence of Play, except that one new Phase is added. This is the *Non-Plotted Order Execution Phase*, which comes right after the New Initials Plotting Phase, and just before the Plotted Movement Execution Phase.

III. THE ADVANCED MOVEMENT AND MANEUVER RULES

Most planes are capable of performing more types of orders than were covered in the Basic Game Rules.

A. ADVANCED MANEUVERS: Collectively, all the Maneuvers covered under this heading are called "Advanced Maneuvers". All the Maneuvers and notations used in the Basic Game are still used, but additional orders can be plotted and Maneuvers executed. The "Advanced Maneuvers" section of the Plane Movement Characteristics Chart on the Data Cards is read and interpreted in the same manner as the "Basic Maneuvers" section.

1. SKID MANEUVERS: A plane can make Skid Maneuvers either to the left ("KL") or to the right ("KR"). A Skid Maneuver will cause the plane to shift its position to one side of its present course. Turn Maneuvers must also be performed in conjunction with a Skid Maneuver. The information for this Maneuver is found in the "Skid" columns on the Data Cards.

a. A plane must be in one of the *Right* Bank Attitudes to perfrom a Skid *Left* Maneuver. A plane must be in one of the *Left* Bank Attitudes to perform a Skid *Right* Maneuver. Planes in one of the Level Bank Attitudes may *not* perform a Skid Maneuver. Put another way, a Plane unit will always perform a Skid Maneuver in a direction that is the *opposite* of the direction of its Bank Attitude.

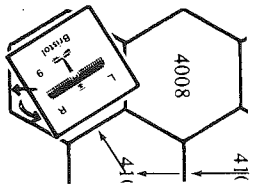
b. On the mapboard, a Skid Maneuver looks similar to a Slip Maneuver. A plane that makes a Skid Maneuver will be shifted into an adjacent hex, and retain its original facing.

c. To indicate a Skid Maneuver, the plane must be plotted with the required number of dashes, followed by the Skid Maneuver notation.

d. Planes that perform a Skid Maneuver *must* also *immediately* perform one *or* two Turn Maneuvers in the hex where the Skid Maneuver was completed. These Turn Maneuvers are always made in the *same* direction as the direction of the Bank Attitude; that is; a Turn Right Maneuver if the plane is in one of the Right Bank Attitudes, and a Turn Left Maneuver if the plane is in one of the Left Bank Attitudes. *For example, a plane that performed a Skid Right Maneuver could immediately perform one or two Turn Left Maneuvers.*

SAMPLE ORDER EXECUTION

SAMPLE ORDER NOTATION



The Turn Maneuver or Maneuvers notations must be plotted at the same time as the Skid Maneuver notation and the dashes are plotted.

e. A Skid Maneuver notation expends one Speed Factor, and causes the loss of one Speed Factor to the next Turn's Initial Speed. Each Turn Maneuver notation also expends one Speed Factor, and causes the loss of one Speed Factor to the next Turn's Initial Speed.

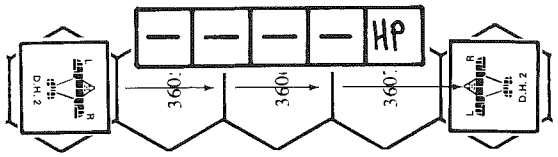
2. HALF-LOOP MANEUVERS: A plane can make a Half-Loop Maneuver either while Climbing or Diving. The notation of "HP" is used for all Half-Loop Maneuvers. Exactly how it is performed depends on its Bank Attitude, and whether it Climbs or Dives during the Turn. A Half-Loop Maneuver will cause the plane to make an 180° Turn (shift its facing three hexsides), change its Altitude Level, and change its Bank Attitude. The information for this Maneuver is found in the "H-Lp/Immel" columns on the Data Cards.

a. A plane must be in one of the Upright Bank Attitudes to perform a Climbing Half-Loop Maneuver. A plane must be in one of the Inverted or Perpendicular Bank Attitudes to perform a Diving Half-Loop Maneuver.

b. During a Turn in which a Climbing Half-Loop Maneuver is performed, the plane must be plotted to Climb at *least* the number of Altitude Levels found in the Zoom Climb column on its Data Card. During a Turn in which a Diving Half-Loop Maneuver is performed, the plane must be plotted to Dive at *least twice* the number of Altitude Levels found in the Zoom Climb column on its Data Card. If the Maneuver extends over more than one Turn, the required number of Altitude Levels must be changed during each of the Turns involved.

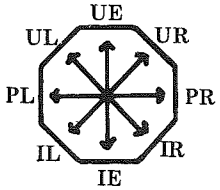
c. A plane that performs a Half-Loop Maneuver will have the front of the Plane unit changed to face the hexside opposite its original facing.

ORIGINAL FACING *FINAL FACING*



d. A plane that performs a Half-Loop Maneuver will have its Bank Attitude changed to the opposite Bank Attitude (see the Bank Attitude Notations Diagram on the Command Sheets). *For example, a plane in an Upright Left Bank Attitude that performed a Half-Loop Maneuver would be changed to an Inverted Right Bank Attitude.*

BANKING ATTITUDE CHANGES IN A HALF-LOOP MANEUVER



e. To indicate a Half-Loop Maneuver, the plane must be plotted with the required number of dashes, followed by the Half-Loop Maneuver notation. Also, be sure to plot the required altitude change, and the Bank Attitude change on the new Initial Bank.

f. A Half-Loop maneuver notation expends one Speed Factor, and causes the loss of one Speed Factor to the next Turn's Initial Speed.

3. IMMELMANN MANEUVERS: A plane can make an Immelmann Maneuver either while Climbing or Diving, and can do either of these to the left ("IL") or to the right ("IR"). An Immelmann Maneuver will cause the plane to make an 180° Turn (shift its facing three hexsides), shift its position to one side of its present course, and change its Altitude Level. The information for this Maneuver is found in the "H-Lp/Immel" columns on the Data Cards. This Maneuver is basically a Half-Loop performed at the same time as a Half-Roll.

a. A plane may be in any Bank Attitude to perform a Diving Immelmann Maneuver. A plane must be in one of the Upright or Inverted Bank Attitudes to perform a Climbing Immelmann Maneuver.

b. During a Turn in which a Climbing Immelmann Maneuver is performed, the plane must be plotted to Climb at *least* the number of Altitude Levels found in the Zoom Climb column on its Data Card. During a Turn in which a Diving Immelmann Maneuver is performed, the plane must be plotted to Dive at *least twice* the number of Altitude Levels found in the Zoom Climb column on its Data Card. If the Maneuver extends over more than one Turn, the required number of Altitude Levels must be changed during all of the Turns involved.

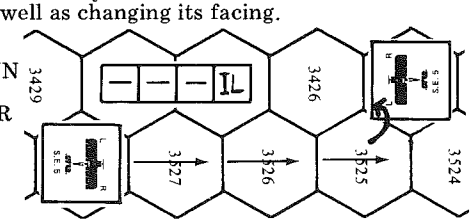
c. Similiar to a Half-Loop Maneuver, a plane that performs an Immelmann Maneuver will have the front of the Plane unit changed to face the hexside opposite its original facing. Unlike in a Half-Loop Maneuver, there is no change in Bank Attitude.

d. To indicate an Immelmann Maneuver, the plane must be plotted with the required number of dashes, followed by the Immelmann Maneuver notation. Also, be sure to plot the required altitude change.

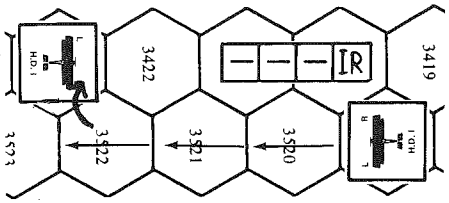
e. An Immelmann Maneuver notation expends one Speed Factor, and causes the loss of one Speed Factor to the next Turn's Initial Speed.

f. A plane that performs an Immelmann Maneuver will be shifted into an adjacent hex in the direction of the Maneuver, as well as changing its facing.

IMMELMANN LEFT MANEUVER



IMMELMANN RIGHT MANEUVER



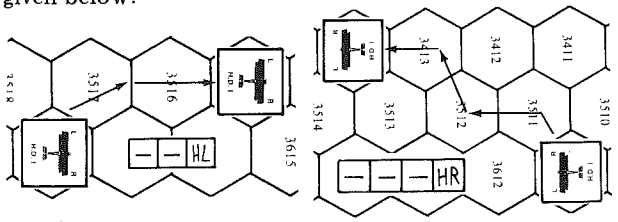
4. HALF-ROLL MANEUVERS: A plane can make Half-Roll Maneuvers either to the left ("HL") or to the right ("HR"). A Half-Roll Maneuver will cause the plane to move to one side or the other of its present course, and change its Bank Attitude. The information for this Maneuver is found in the "Rolls" columns on the Data Cards.

a. A plane may be in *any* Bank Attitude to perform either a Half-Roll Left Maneuver or a Half-Roll Right Maneuver.

b. A plane that performs a Half-Roll Maneuver will have its Bank Attitude changed to the opposite Bank Attitude (this is the same as the Bank Attitude changes for a Half-Loop Maneuver).

c. A plane that performs a Half-Roll Maneuver will retain its original facing.

d. To indicate a Half-Roll Maneuver, the plane must be plotted with at least the listed number of dashes, followed by the Half-Roll Maneuver notation. Also be sure to plot the Bank Attitude change on the new Initial Bank. Unlike all previously described Maneuvers, where the dashes always indicate a movement of one hex straight ahead, for Half-Roll Maneuvers, the dashes alternately indicate movement one hex to the side in the direction of the Maneuver (right or left), then one hex straight ahead, etc. The Maneuver notation is always moved straight ahead. Examples of Half-Roll Maneuvers are given below:



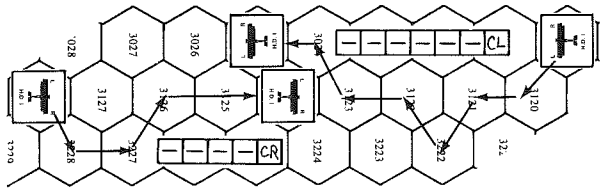
e. A Half-Roll notation expends one Speed Factor and causes the loss of one Speed Factor to the next Turn's Initial Speed.

5. BARREL ROLL MANEUVERS: This Maneuver, often called a "corkscrew", looks very similar to two opposite Half-Roll Maneuvers when executed on the mapboard. A plane can make Barrel Roll Maneuvers either to the left ("CL") or to the right ("CR"). A Barrel Roll Maneuver will cause the plane to move to one side or the other of its present course, then return to its original course. The information for this Maneuver is found in the "Rolls" columns on the Data Cards.

a. A plane may be in *any* Bank Attitude to perform either a Barrel Roll Left Maneuver or a Barrel Roll Right Maneuver. The Bank Attitude at the conclusion of the Maneuver will be the *same* as it was at the beginning of the Maneuver (in reality, the plane has pivoted through 360° of Bank Attitudes while performing the Maneuver).

b. A plane that performs a Barrel Roll Maneuver will retain its original facing.

c. To indicate a Barrel Roll Maneuver, the plane must be plotted with at least *twice* the listed number of dashes, followed by the Barrel Roll Maneuver notation. *For example, if the number listed in a Roll column is a "3", this would have to be doubled to a "6" for a Barrel Roll Maneuver.* As with Half-Roll Maneuvers, the dashes alternately indicate movement one hex to the side, one hex straight ahead, etc. For the first half of the plotted hexes, the direction to the side is in the direction of the Maneuver (right or left), but for the second half of the plotted hexes, the direction to the side is in the *opposite* direction of the Maneuver. The Maneuver notation is always moved straight ahead. Examples of Barrel Roll Maneuvers are given below:



d. The number of dashes plotted for a Barrel Roll Maneuver must always be an *even* number. If not, treat it as an Illegal Order — Maneuver Improperly Plotted.

e. The Barrel Roll notation expends one Speed Factor, and causes the loss of one Speed Factor to the next Turn's Initial Speed.

6. "X": Maneuver columns on Data Cards that contain a "X" indicate Maneuvers that the plane cannot perform. If such a Maneuver is plotted, the plane is automatically destroyed and removed from play.

7. MANEUVER REFERENCE CHART: For convenience, all Maneuvers are summarized on the *Maneuver Reference Chart* on the back of this rulebook.

B. SNAP MANEUVERS: Some Maneuvers may be performed more quickly at an increased cost in lost Speed Factors.

1. Snap Maneuvers are performed normally, but in fewer Impulse Columns and hexes moved. Snap Maneuvers are possible for all types of Basic and Advanced Maneuvers except for Bank and Climbing Immelmann Maneuvers, and Maneuvers that require no dashes. Snap Turn Maneuvers and Snap Diving Immelmann Maneuvers may be performed only if the plane is in one of the Perpendicular Bank Attitudes. No Snap Maneuvers may be initiated during a Turn in which a plane is in its Dive Speed Increment.

2. The number of dashes required to be plotted to perform a Maneuver may be reduced by as much as half. Any fractions are rounded up. *For example, if a Turn number is a "3" or "4", the minimum Snap Turn number is "2" in both cases.* For a Snap Barrel Roll Maneuver, find the minimum Snap Roll number, round it up if necessary, then double to find the minimum Snap Barrel Roll number.

3. To indicate the extent of the reduction, change dashes to plus signs ("+") for each reduction. *For example, if the normal notation is "— — — — TL", the Snap Turn notation could be "+ — — TL" (where one dash was eliminated) or "+ + TL" (where two dashes were eliminated).*

4. Snap Maneuvers are executed normally, only with the reduced number of plotted hexes required for their performance. However, each "+" counts as an *additional* Speed Factor loss to the next Turn's Initial Speed.

5. Planes with the ⊛ symbol may *not* perform Snap Maneuvers.

C. ADVANCED CLIMB RULES: The Normal Climb Rates listed on the Data Cards represent normal, sustained Climb Rates. For short periods, these Rates can be increased.

1. ZOOM CLIMBS: A Zoom Climb is a greater than normal Climb Rate. The Zoom Climb number is added to the Normal Climb Rate number to find the "Maximum Climb Rate" number. The Maximum Climb Rate number is the maximum number of Altitude Levels a plane may Climb during one Turn.

a. Any plane may use its Maximum Climb Rate number instead of its Normal Climb Rate number. In fact, this may prove necessary in order to perform Maneuvers such as Half-Loops and Immelmanns while Climbing. All the usual Basic Game rules apply.

b. Climbing a number of Altitude Levels covered by the Normal Climb Rate is handled normally. However, any plane Climbing a number of Altitude Levels during a Turn that exceeds its Normal Climb Rate must use a modified Climb Rate Fraction to determine Speed Factor loss due to Climbing. These modified Climb Rate Fractions, called "Zoom Climb Rate Fractions", are as follows:

"1/3" becomes "1/2" up through Altitude Level "400", and becomes "1/1" at higher Altitude Levels.
"1/2" becomes "1/1".
"1/1" becomes "2/1" (lose *two* Speed Factors per Altitude Level Climbed).

2. BANK EFFECTS ON NORMAL CLIMB RATE: The Normal Climb Rate number is reduced by one if the Climbing plane is *not* in an Upright Level Bank Attitude, but is in an Upright Left or Upright Right or an Inverted Bank Attitude. Climbing is not possible by planes in a Perpendicular Bank Attitude for the entire Turn.

a. If the Normal Climb Rate number is a fraction, and the number is reduced by one, add one to the fraction's divisor. *For example, if the Normal Climb Rate is "1/2", "reducing" this by one makes it "1/3".*

b. Zoom Climb numbers may still be added at full value to a reduced Normal Climb Rate number.

D. THE ENGINE OFF BRAKE FACTOR: "Engine Off" rules apply when the Engine is voluntarily turned off, quits due to Inverted Movement, or is stopped due to damage. These rules reflect the increased "drag" set up when the propeller is not turning. Indicate that the Engine is "off" by circling the Brake Factor notation in the plane's Speed Change column during an Order Plot Phase.

1. While the Engine is "off", no Power Factors can be applied.

2. While the Engine is "off", no Snap Maneuvers may be plotted (previously plotted Snap Maneuvers may be completed).

3. While the Engine is "off", the "Engine Off Brake Factor" (at the top of the Brake Factors column on the Data Cards) *must* be used, and at *least* that number of Brake Factors must be plotted for use that Turn.

4. Players may voluntarily turn off the Engine or Engines simply by circling the Brake Factors during the Order Plot Phase. This is a useful way to increase the number of available Brake Factors for a Turn or so. The Engine may be turned back "on" simply by *not* circling the Brake Factors during a later Order Plot Phase, after it has been voluntarily turned off.

5. Wing hits do not reduce the Engine Off Brake Factor.

E. INVERTED MOVEMENT: World War I planes had crude carburators, and Engines would quickly quit due to lack of gasoline during inverted flight.

1. Planes whose Data Card's Special Rules sections state, "May not fly Inverted", may never be placed in one of the Inverted Bank Attitudes. They are destroyed and removed from play if this is ever done.

2. For other planes, the Engine will "quit" in the following situations:

a. ROTARY ENGINED PLANES: If a plane with a Rotary Engine remains in an Inverted Bank Attitude for *two* complete, consecutive Turns, the Engine quits and must be marked as "off" for the following Turn. The Engine must then remain off until any later Turn when the plane's Initial Bank is an Upright or Perpendicular Bank Attitude, at which time it can be turned back on.

b. INLINE ENGINED PLANES: If a plane with an Inline Engine remains in an Inverted Bank Attitude for *one* complete Turn, the Engine quits and must be marked as "off" for the following Turn. The Engine must then remain off until any later Turn when the plane's Initial Bank is an Upright or Perpendicular Bank, at which time it can be turned back on.

IV. THE ADVANCED GUNFIRE RULES

These rules increase the number of variables to consider when firing, and cover additional types of guns.

A. ADVANCED GUN PLAY: Basic Game Rules only allow for the use of planes with a "12 o'clock Level" arc as their Gun Play. Other arcs are possible for other types of Guns, and more limitations must be placed on Fixed Machineguns. These rules replace the Basic Gun Play rules.

1. READING THE GUN PLAY DIAGRAM: Guns may still be used only against targets that fall into their Gun Play, but the possible arcs for various Guns are numerous. The *Gun Play Diagram* on the Data Cards show the Gun Plays in a "clock" reference system for each Gun Position. The shaded arcs show where the Guns can fire.

a. CLOCK REFERENCE: A modified clock reference system is used for determining directions, based on the facing of a Plane unit. Simply imagine a clock laid flat on the axis of the plane, with the 12 o'clock position being directly ahead of the plane, the 6 o'clock position being directly behind the plane, etc. This system can be used to determine exactly which hexes fall in the various clock positions with relation to a Plane unit. See the *Clock Reference Diagram* on the Game Card for the clock positions of each hex surrounding a Plane unit (note that, for game purposes, these clock positions vary slightly in size).

b. RELATIVE ALTITUDES: The Gun Play Diagrams also show the altitude of a possible target unit in relation to the firing plane.

(1) LOW: The outer row on the Gun Play Diagrams shows "Low" targets. To be Low, a target unit must be at a lower Altitude Level than the firing plane, and in a different hex.

(2) LEVEL: The center row on the Gun Play Diagrams shows "Level" targets. To be Level, a target unit does not have to be at *exactly* the same Altitude Level as the firing plane, but the allowable altitude difference varies with the Range. To be considered Level, the target plane's difference in Altitude Levels with the firing plane must be equal or less than the Hex Range, and they must be in different hexes. Thus, to some extent, Level overlaps both High and Low.

(3) HIGH: The inner row on the Gun Play Diagrams shows "High" targets. To be High, a target unit must be at a higher Altitude Level than the firing plane, and in a different hex.

(4) UP: If a "U" appears in the center of a Gun Play Diagram, the Guns may be fired at targets that are at a higher altitude than the firing plane, and in the *same* hex.

(5) DOWN: If a "D" appears in the center of a Gun Play Diagram, the Guns may be fired at targets that are at a lower altitude than the firing plane, and in the *same* hex.

c. GUN PLAY ARCS: The clock position and relative altitude information is put together to form "Gun Play Arcs" that define where Gun Positions may fire. These arcs are identified by combining the clock reference with the altitude reference into terms such as "6 o'clock Low" and "12 o'clock High". Up and Down arcs are called just "Up" and "Down".

d. BLOCKED GUN PLAY: Parts of the firing plane may "block" part of a Gun Play Arc. This is displayed on the Gun Play Diagrams when the clock position number is circled. This indicates different things, depending on the number circled.

(1) BLOCKED 6 O'CLOCK POSITION: This indicates that the tail partially blocks the 6 o'clock Level arc. If the target is in this arc, and *directly* behind the firing plane, no shot is possible.

(2) OTHER BLOCKED CLOCK POSITIONS: For all other clock positions, this indicates that the fuselage or wings partially blocks their *Low* arcs. If the target is in these arcs, no shot is possible unless the target is at *least* four Altitude Levels lower than the firing plane.

2. ADVANCED GUN TYPE CHARACTERISTICS: How a Gun is attached to a plane affects its Gun Play Arcs. Fixed Machineguns, Fixed Heavy Machineguns, and Fixed Heavy Cannon are all permanently and immovably attached to the plane, and may only be fired in the direction to which they point. The whole plane must be turned to fire in a new direction. Flexible Machineguns and Flexible Light Cannon are both flexibly attached to the plane, and can be pivoted to fire in a number of different arcs, without the need to turn the whole plane. Slide Machineguns are attached to a slide rail that permits the Gun to be moved up and down, allowing a variety of arcs in the same clock position. Note that Cannon have two Ranges listed. The first is for firing at "flying" targets, and the second (in parenthesis) is for firing at targets on the surface.

B. ADVANCED GUNFIRE PROCEDURES: Basic Game planes used only Fixed Machineguns. Other types of Guns were also found in World War I planes.

1. FIXED MACHINEGUNS: As found in the Basic Game Rules. The Basic Hit Table is found in the "Fixed Air" section of the Gunnery Tables.

2. FLEXIBLE MACHINEGUNS: Procedure is the same as in the Basic Game, but the Basic Hit Table is found in the "Flex. Air" section of the Gunnery Tables.

NOTE: Some Flexible Guns can face only one Clock Position. These still use the "Flex. Air" section of the *Gunnery Tables.*

3. SLIDE MACHINEGUNS: Procedure is the same as in the Basic Game, but the Basic Hit Table is found in the "Fixed Air" section of the Gunnery Tables when the Gun Play Arc fired into is 12 o'clock Level, and the Basic Hit Table is found in the "Flex. Air" section of the Gunnery Tables for fire into any other arcs.

4. HEAVY MACHINEGUNS: Procedure is the same as for Fixed Machineguns, except for using the Hit Tables. For Heavy Machineguns, the two dice are rolled *twice*, and all hits scored by *both* rolls are marked on the target.

5. CANNONS: Both Fixed Heavy Cannon and Flexible Light Cannon follow a different Gunfire Procedure than other Guns.

a. CANNON GUN VALUE: Instead of having a number of bursts, Cannon are defined as having a "Cannon" value, as shown on the bottom line of the Gunnery Tables.

b. CANNON HIT NUMBER: Consult the Gunnery Tables, using the "Fixed Air" section for Fixed Heavy Cannon, and the "Flex. Air" section for Flexible Light Cannon. Crossgrid the word "Cannon" with the Actual Range to find the "Cannon Hit Number".

c. CANNON HIT NUMBER MODIFIERS: The Hit Table Modifiers are applied normally to calculate a cumulative Total Modifier Number.

d. CANNON FINAL MODIFIER NUMBER: Using the Modifier Chart, crossgrid the Total Modifier Number with the word "Cannon". The number found is the "Cannon Final Modifier Number".

e. CANNON HIT DETERMINATION: Now roll the two dice. Add or subtract (depending on whether the Cannon Final Modifier Number was positive or negative) the Cannon Final Modifier number to or from the number rolled on the colored die. If the modified number rolled equals or exceeds the Cannon Hit Number, a "Cannon Hit" has been scored. If the modified number roll is less than the Cannon Hit Number, the shot "missed".

f. USING THE HIT TABLES FOR CANNON HITS: For each Cannon Hit, the dice are rolled *twice* using the Hit Tables, and all hits scored by *both* rolls are marked on the target. For Fixed Heavy Cannon, Hit Table 14 is used twice, and for Flexible Light Cannon, Hit Table 12 is used twice.

6. FIRING MIXED GUN TYPES: In many cases, the same Crewman operates Guns in several different Gun Positions.

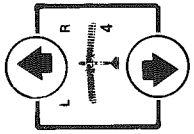
a. A Crewman who can operate all Gun Positions may fire all Fixed and/or Slide Gun Positions at the same time, if all are fired at the same target unit in the same arc. Only one or the other may be fired otherwise — the same Crewman may not be used to fire different Gun Positions at different targets at the same time.

b. A Crewman who can operate more than one Flexible Gun Position, may be used to operate only one of these Gun Positions at a time.

c. Different Crewmen operating Different Gun Positions may fire at the same (treated as separate shots) or different targets at the same time, as desired by the controlling player.

C. FLEXIBLE GUN UNITS: The Flexible Gun units are used to show the facings of the Flexible Gun Positions.

1. One Flexible Gun unit per Flexible Gun Position is placed on top of all Plane units that need them. These are turned to face any direction in which the Gun Position can be fired.



a. These units are only necessary for Flexible Guns which have Gun Play Arcs in more than one clock position.

b. Be careful to face the arrow towards a hexside, not towards a hex angle.

c. On some Plane units, the presence of a number of Flexible Gun units plus the Bank unit can get a bit crowded. Place some of these smaller units beside the Plane unit, if necessary, to allow enough room.

2. Flexible Gun units are turned during the Non-Plotted Order Execution Phase. The number of hexsides which each Flexible Gun unit may be turned each Turn is listed in the "Flexible Gun Turning" section on the Data Cards.

3. If one Crewman operates more than one Flexible Gun Position, only one of the Flexible Gun units representing these Gun Positions may be turned during each Turn, and only the one turned can be fired. If none were turned, the Crewman may fire any one of these Gun Positions.

4. A Flexible Gun unit can be turned to face in any direction allowed, as shown on the Gun Play Diagram for the Gun Position it represents. It may then be fired at *any* High, Level, or Low target in that clock position, if the arc allows. If a Gun Position may fire Up or Down, it may do so regardless of its current facing.

5. Flexible Machineguns or Flexible Light Cannon on planes with a new Initial Speed of "7", or more, may fire only into the 6 o'clock Level and 12 o'clock Level arcs, if these are possible. This restriction comes from the plane's slipstream, which makes high speed manual firing almost impossible.

D. ADVANCED FIRE MODIFIERS: These Modifiers are used with and in the same manner as the Basic Game Hit Table Modifiers.

1. TARGET IN SPIN: If the target plane ends a Turn in the Stall Speed Increment, and will perform a Spin Maneuver during the next Turn, it is in a Spin, and a "-4" Modifier applies to the shot.

2. TARGET IN SLIP, SKID, OR ROLL: If the target plane finished the Turn with an order notation for any Slip, Skid (including the Turn Maneuver notations performed in conjunction with the Skid Maneuver), Half-Roll, or Barrel Roll Maneuvers, or with a dash or plus preceeding one of these Maneuvers, a "-2" Modifier applies to the shot.

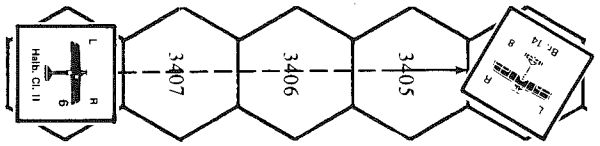
3. FIRING IN SPIN: If the firing plane ends a Turn in the Stall Speed Increment, and will perform a Spin Maneuver during the next Turn, it is in a Spin, and a "-8" Modifier applies to the shot.

4. FIRING IN SLIP OR ADVANCED MANEUVER: If the firing plane finished the Turn with an order notation for any Slip or Advanced Maneuver, a "-6" applies to the shot.

5. FIRING IN DIVE SPEED: If the firing plane ends a Turn with a new Initial Speed that falls in its Dive Speed Increment, a "-2" Modifier applies to the shot.

6. DEFLECTION MODIFIERS: The Deflection Modifiers consider the angles formed between units, leads required for shots, and relative movements.

a. The Deflection Modifier Chart on the Game Card is used to find the Modifiers caused by various deflections. Determine the clock position into which the target unit falls in relation to the firing unit — this is the "Firing Unit Clock Position" listed along the top of the Chart. Then, determine the clock position into which the firing unit falls in relation to the target unit — this is the "Target Unit Clock Position" listed along the left side of the chart. Crossgrid the two clock positions. The number found in the Chart is the "Deflection Hit Table Modifier". *For example, in the diagram below, Plane A fires at Plane B. The Firing Unit Clock Position is 12 o'clock, and the Target Unit Clock Position is 2 o'clock. Crossgridding "12" (across the top) with "2" ("2 or 10", on the left side) gives a Deflection Hit Table Modifier of "-2".*



b. Deflection Hit Table Modifiers are used cumulatively with all other Basic and Advanced Hit Table Modifiers.

V. THE ADVANCED DAMAGE RULES

These rules provide for a more detailed accounting of damage than is found in the Basic Game Rules.

A. ADVANCED COLLISIONS: Ignore the Basic Game Rule that planes involved in plane-to-plane Collisions are automatically destroyed.

1. In plane-to-plane Collisions, roll the two dice twice for each involved plane, using Hit Table 12 to determine the hits scored on each as a result of the Collision.

a. Planes involved in a Collision may not fire during the Collision Turn, even if not destroyed.

b. Involved planes that survive are left at the same Altitude in the hex where the Collision occurred, and may move out normally on the next Turn.

2. For Collisions with the ground, any plane found to be at an Altitude Level that is *less* than the Ground Altitude Level is destroyed and removed from play. However, a plane that is at an Altitude Level that is exactly equal to the Ground Altitude Level will make a "Crash Landing" (see B.6.c., below).

B. ADVANCED DAMAGE EFFECTS: Hits are marked as in the Basic Game, but some additional effects will also apply.

1. ADVANCED GUN AND FIRE HITS: Exactly the same as in the Basic Game Rules.

2. ADVANCED WING HITS: If the number of Wing hits equals one-half or more of the target's Wing number, no Advanced Maneuvers, Snap Maneuvers, or Spin Maneuvers can be performed. Any plane involved in one of these Maneuvers (i.e., it has been carried over into the next Turn) at the time the required number of Wing hits is marked is destroyed and removed from play.

3. ADVANCED STRUCTURE HITS: If the number of Structure hits equals one-half or more of the target's Structure number, no Advanced, Snap, or Spin Maneuvers can be performed without the plane being destroyed (same as with one-half Wing hits).

4. ADVANCED CONTROL HITS: With one or two Control hits, no Advanced, Snap, or Spin Maneuvers can be performed without the plane being destroyed. (same as with one-half wing hits).

5. ADVANCED CREW HITS: These are basically the same as for the Basic Game, with a few additions.

a. PASSING OUT: A Crewman with one or two Crew hits that is in a plane that is performing Advanced or Snap Maneuvers, or a Spin Maneuver will "pass out" and be eliminated. If the Crewman is the only or last Pilot on the plane, and if no Dual Controls are available to another Crewman, this elimination will cause the plane to be destroyed and removed from play.

b. DUAL CONTROLS: If the plane's Special Rules section of its Data Card states that the plane "Had Dual Controls.", it may be flown by a non-Pilot Crewman if the Pilot is eliminated. Planes flown by a non-Pilot Crewman using Dual Controls may only perform Bank Maneuvers, Straight Ahead Maneuvers, Dive, and use Power and Brake Factors. Involvement in any other Maneuvers, or in Climbs, will cause the Plane to be destroyed and removed from play.

6. ADVANCED ENGINE HITS: In the Advanced Game, Engines only stop as a result of damage — a plane is not automatically destroyed when all Engine hits are marked off. If excess Engine hits are scored, mark the excess as Structure hits. In all cases, if the number of Power Factor reductions equals or exceeds the number of Power Factors, the Power Factor is treated as "0".

a. SINGLE-ENGINE PLANES: Same as in the Basic Game Rules, except that the Engine is eliminated and stops without destroying the plane.

b. MULTI-ENGINE PLANES: On planes with two or more Engines, the Engines are eliminated when the number of hits equals three on each. Excess Engine hits are marked on other Engines until all are eliminated, then any additional Engine hits are marked as Structure hits.

(1) TWO-ENGINE PLANES: Reduce the plane's Power Factors by one if both Engines have at least one Engine hit. Reduce the plane's Power Factors by two if both Engines have two Engine hits. *All* Power Factors are lost if one of the Engines is destroyed.

(2) THREE-ENGINE PLANES: One Power Factor is lost per eliminated Engine. When any two Engines are eliminated, treat the third Engine as if it also had stopped, although Engine hits could still be marked on it.

(3) FOUR-ENGINE PLANES: One Power Factor is lost per eliminated Engine. It two Engines on the same side of the plane, or any three of the four Engines are eliminated, treat the remaining Engines or Engine as if it also had stopped, although Engine hits could still be marked.

c. CRASH LANDINGS: When a plane has lost the use of all of its Engines, the Engine Off Brake Factor must be used, no Power Factors are available, and, eventually, the plane has no where to go but down. The player may continue to move and fire the plane (and it may still be a target for hostile fire) until it is destroyed or the Ground Altitude Level (always "0" in the Basic and Advanced Games) is reached, at which time a "Crash Landing" may be made. NOTE: If an Engineless plane "leaves" the mapboard with no pursuit (i.e., there is no reason to shift mapboard sections to continue the battle), the Crash Landing procedure should still be followed for the plane. It is important to check the outcomes of all Crash Landings, as this can cause differences in the number of Victory Points awarded.

(1) Crash Landings are resolved during the Plotted Order Execution Phase, the same as Collisions. To make a Crash Landing, instead of Colliding with the ground, the plane must end a Turn at *exactly* the Ground Altitude Level. When this is done, the *Crash Landing Tables* on the Game Card are consulted.

(2) CRASH LANDING TABLES PROCEDURE: Select the column of these Tables that lists the *total* number of Control hits and Crew hits on the Crewman flying the plane (use the best Pilot, if there is a choice). Roll the two dice, and modify the number rolled for any Modifiers that apply. Crossgrid the modified dice roll with the correct column to find the results of the Crash Landing.

(3) CRASH LANDING TABLES MODIFIERS: Modify the number rolled on the colored die for each of the (cumulative) Modifiers that apply. Add "1" for each Speed Factor by which the Crash Landing plane exceeds the speed of "3"; and add "1" if a non-Pilot Crewman is flying using Dual Controls. Also, add "1" if the plane is on Fire, Lands in the wrong environment (i.e. a seaplane on land or a land plane on water), or is not in an Upright Bank Attitude.

(4) CRASH LANDING RESULTS: "OK" indicates a successful landing with no further damage. "C" indicates a successful landing, but one more Crew hit is suffered (controlling player may select any surviving Crewman on which to mark the hit). "S" indicates a successful landing, but another Structure hit is suffered. "WRK" indicates an unsuccessful landing, and the plane and all Crewmen are eliminated.

7. ADVANCED FUEL HITS: If the number of Fuel hits equals the target's Fuel number, the plane is not destroyed, but all of its Engines must be turned "off". Excess Fuel hits are marked as Structure hits.

C. ADVANCED ENGINE-CREW HIT PRIORITIES: This is the same as the Basic Game rule (see VII.E.3.c. of the Basic Game Rules), except that the planes do not have to be at exactly the same Altitude Level. If the target plane is in the Level arc from the firing plane, the rule applies.

VI. PLANE VARIANTS

Most Data Cards identify and list information for one or more Variants of the standard planes found on the Cards. These can be used instead of the standard plane found on the Card, if the player wishes.

A. VARIANT GUNS: If the Variant is armed differently than the standard plane, the different armament is displayed in the Variant Gun Characteristics section of the Data Card. This information, which is interpreted exactly the same way as in the Plane Gun Characteristics Chart section, is used instead of the standard information.

B. VARIANT POINTS: Any *differences* from the standard Point Values are listed, and these Points should be used instead of the standard Point Value if the appropriate Variant is used.

C. VARIANT MOVEMENT CHARACTERISTICS: The Plane Movement Characteristics Chart on the Data Card

may list some information in parenthesis showing where the performance of a certain Variant *differs* from the standard plane. If the specified Variant is used, use the numbers in parenthesis instead of the standard numbers in the same column. EXCEPTION: For Half-Loop and Immelmann Maneuvers, always use the standard Zoom Climb numbers for their necessary altitude changes.

D. VARIANT SPECIAL RULES: Any other rules that apply to a Variant may be listed in the Special Rules section of the Data Card.

VII. ADVANCED VICTORY POINTS

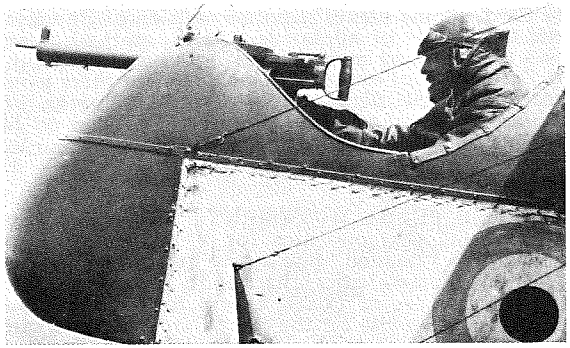
In the Basic Game, Victory Points for opposing planes are awarded only for their destruction. Under the Advanced Game Rules, Victory Points may also be awarded for damaging opposing planes. Successful or unsuccessful Crash Landings can greatly affect the Victory Points that a side is awarded. The four Victory Point Values listed for each plane are broken down according to the damage done to that type of plane. In the order of their listing, these are as follows:

A. TOTAL VICTORY POINT VALUE: This is awarded if the plane and all Crew are destroyed.

B. PLANE DESTROYED VICTORY POINT VALUE: This is awarded if the plane is destroyed, but at least one Crewman survives. Subtract three Points from this Value for each surviving Crewman that has "0" hits. *For example, if a plane is worth "15" Victory Points, but one unhit Crewman survives, it is worth only "12" Victory Points.*

C. SERIOUS DAMAGE VICTORY POINT VALUE: This is awarded if the plane has been hit, but not destroyed, and at least one Crewman has been eliminated or has two hits. Add three Points to this Value for each Crewman that has been eliminated, if any.

D. LIGHT DAMAGE VICTORY POINT VALUE: This is awarded if the plane has been hit, but not destroyed, and no Crewman has taken more than one hit.



THE OPTIONAL RULES

I. INTRODUCTION TO THE OPTIONAL RULES

The rules and mechanics of the Advanced Game should be mastered before trying any of the Optional Rules. The Optional Rules are just that — optional — they can be added to a game in any combination to suit the players' tastes. Each Optional Rule adds greater scope and detail, as well as additional complexity to the play of the game. Some Optional Rules are required for the use of certain units, and are not necessary if those units are not used in a particular game. These rules in most cases simply add to the Basic and Advanced Game Rules, which still apply unless otherwise stated. New Phases are added to the Sequence of Play when certain Optional Rules are used. The full Sequence of Play for a game using all of these Optional Rules is printed on the back of this rulebook. Simply ignore any Phases that do not apply to the rules used in a particular game.

II. MAPBOARD TERRAIN

Some scenarios use Terrain units to represent natural or man-made features that can affect play.

A. SURFACE TERRAIN: Ground, Hanger, Building, and Ship units can all be significantly higher than surrounding ground (or water) features. Methods for determining the heights of these units are covered in the scenarios.

1. BLIND AREAS: Terrain and other units can create "blind" areas on the mapboard between specific locations. To determine if a blind area is caused by a unit or units located between two other units, run a straight edge between the Dots in the hexes containing the units being checked.

a. No blind areas exist if the intervening hexes are lower in Altitude Levels than both of the units involved.

b. If the straight edge passes through any part (including a hexside) of an intervening hex that is higher in Altitude Levels than *both* of the involved units, they are both in each other's blind areas.

c. If the straight edge passes through any part (including a hexside) of an intervening hex that is higher in Altitude Levels than one of the involved units, but lower in Altitude Levels than the other involved unit, some calculations are required.

(1) Figure the Actual Range between the two involved units.
(2) Individually figure the Actual Ranges from each involved unit to the intervening hex.
(3) If the Actual Range between the two involved units is equal to or less than the *sum* of the Actual Ranges from both units to the intervening hex, Sighting and firing is possible between the units. If not, they are both in each other's blind areas.

d. No Sighting or shooting is possible between two units located in each other's blind areas. The same rules apply to Sighting specific surface hexes.

2. OPTIONAL GROUND ALTITUDE LEVEL: In the Basic and Advanced Games, the Ground Altitude Level is always considered to be "0", or sea level. Actually, most land is higher than sea level, some land is actually lower than sea level, and not all seas are at sea level. Players may decide for themselves exactly what the Ground Altitude Level for a particular game will be. Any Ground, Hanger, Building, or Ship units on the mapboard will have their heights added to the Ground Altitude Level. *For example, a Hill unit that is 30 Altitude Levels high that is placed on a mapboard where the Ground Altitude Level is defined to be 200, would be 230 Altitude Levels high.*

a. Any plane unit at an Altitude Level that is lower than the Altitude Level of the hex in which it ends movement will Collide with the ground (or water) and be destroyed.

b. If the Ground Altitude Level used is ever less than "0", treat these lower Altitude Levels as falling into the "1-100" Altitude Range for movement purposes.

B. CLOUD TERRAIN: The Cloud units may be used to represent the scattered locations of clouds, or to represent "breaks" in an otherwise solid cloud bank. Cloud unit set up is covered in the scenarios.

1. Planes may fly into or through Clouds. A unit located in a Cloud may not Sight or fire, cannot be a target for fire, and cannot be Sighted.

2. BLIND AREAS: Cloud hexes located between two units may create blind areas.

a. If both involved units are located at higher Altitude Levels than the *lowest* Altitude Level of the Cloud, blind areas can be determined the same as for Surface Terrain, just as if the "top" of the Cloud were the "top" of a Hill.

b. If one unit is located at an Altitude Level that is higher than the highest Altitude Level of the Cloud, and the other unit is located at an Altitude Level that is lower than the lowest Altitude Level of the Cloud, they are both in each other's blind areas.

c. If both involved units are located at lower Altitude Levels than the *highest* Altitude Level of the Cloud, blind areas can be determined similarly to Surface Terrain, but in reverse.

(1) No blind areas exist if the intervening hexes are higher in Altitude Levels than both of the involved units.
(2) If the straight edge passes through any part (including a hexside) of an intervening hex that is lower in Altitude Levels than *both* of the involved units, they are both in each other's blind areas.
(3) If the straight edge passes through any part (including a hexside) of an intervening hex that is lower than one, but higher than the other unit, use the same

procedure as for Surface Terrain, but calculate Actual Ranges to the *lowest* Altitude Level of the Cloud.

C. THE SUN: The Sun unit may be used to represent the position of the Sun. Sun unit set up is covered in the scenarios. The Sun has a variety of effects on play.

1. FIRING INTO SUN: A Gun facing in the *same* direction as the Sun unit's Direction Arrow and fired at a target unit located at a *higher* Altitude Level, calls for a "-6" Modifier to be applied to the shot.

2. LOOKING INTO THE SUN: A Sighting Attempt in the *same* direction as the Sun unit's Direction Arrow, and at a target unit located at a *higher* Altitude Level, calls for a "-3" Modifier to the dice roll.

III. SIGHTING RULES

These rules cover the difficulties in "seeing" another unit.

A. SIGHTING VALUES: Each Data Card includes a Sighting Values Diagram. This Diagram is interpreted in the same manner as the Gun Play Diagrams, showing various arcs. The numbers for each arc are the "Sighting Numbers". Note that some Data Cards show some different Sighting Numbers for Variants. The Sighting Numbers for all Non-Plane units are "23" in all arcs.

B. SIGHTING PROCEDURES: When using the Sighting Option, players make "Sighting Attempts" to "see" enemy units. Players may make one Sighting Attempt per plane per Turn. All Sighting Attempts are made during the Sighting Phase.

1. Units in each other's blind areas can never be Sighted.

2. The controlling player selects an "unseen" unit on which to make a Sighting Attempt. This "unseen" unit is called the "target unit". Find the target unit's location in relationship to the plane used for making the Sighting Attempt, and use the Sighting Number from that arc.

3. Roll the two dice, and modify the number rolled by any applicable Sighting Modifiers. If the modified number rolled is *larger* by "30", or more, than the Sighting Number in the arc, the target unit is "seen" by the unit used, and by all planes in its Formation (if a Formation of planes). If the modified number roll is *smaller* than the Sighting Number plus "30" of the arc, the target unit remains "unseen".

C. SIGHTING MODIFIERS: These Modifiers are cumulative in their effect on a dice roll, and apply only where applicable.

1. SIZE MODIFIER: The Size Modifier on the target plane's Data Card modifies the dice roll by the listed number. Balloon, Zeppelin, and Ship units also have Size Modifiers (see Optional Rules VI.).

2. LOOKING INTO THE SUN: If the target unit is located in a higher Altitude Level than the plane making the Sighting Attempt, and in the *same* direction as the Sun unit's Direction Arrow, a "-3" Modifier applies.

3. VISIBILITY CONDITIONS: The Visibility Conditions determined for the scenario apply to modify the dice roll (see Scenarios VIII.B.).

4. DISTRACTED: If the unit used for the Sighting Attempt fired any Gun or Rockets, was shot at, dropped any Grenades, Bombs, Torpedoes, or Smoke Candles, was on Fire, Jettisoned anything, Reloaded or Cleared Jams on any Guns, or moved into any hex required for the fulfillment of scenario objectives during the previous Turn, it is "Distracted", and a "-2" Modifier applies.

5. SIGHTING A GROUND UNIT: If the target unit is a Combat unit on the ground (or water) or a Vehicle unit, a "-1" Modifier applies.

6. IN ADVANCED OR SPIN MANEUVER: If the plane used for the Sighting Attempt finished the previous Turn with an order notation for any Advanced Maneuver (including the Turn Maneuvers associated with a Skid Maneuver), or with a dash or plus preceeding one of these Maneuvers, or will perform a Spin Maneuver during the current Turn, a "-3" Modifier applies.

7. PER CREW ELIMINATED: A "-2" Modifier applies for *each* eliminated Crewmen on the unit used for the Sighting Attempt. Note that this Modifier applies on Variants that carry fewer Crewmen than normal — the Crewmen not carried are treated as if they were eliminated.

8. INEXPERIENCED: If the Crewmen on the unit used for the Sighting Attempt are of Inexperienced Quality, a "-2" Modifier applies.

9. EXPERIENCED: If the Crewmen on the unit used for the Sighting Attempt are of Experienced Quality, a "+2" Modifier applies.

10. RANGE MODIFIERS: The Actual Range from the unit used for the Sighting Attempt to the target unit modifies the dice roll. A "+1" Modifier applies if the Actual Range is one to fifty hexes. A "-1" Modifier applies if the Actual Range is one hundred and one to one hundred fifty hexes. A "-2" Modifier applies if the Actual Range is one hundred fifty one or more hexes. NOTE: For Ranges beyond those on the *Range Finder Chart*, add one Range per five additional Altitude Levels difference.

11. FORMATION MODIFIERS: A "Formation" of planes is any group of planes that are all within an Actual Range of "2" of each other, or of at least one other plane that meets the definition. When one plane in a Formation "sees" something, they are all considered to do so. When one plane in a Formation is "seen", they are all considered to be so. Large Formations are easier to spot than individual planes or small Formations, and the number of planes in a Formation can modify the dice roll. A "+1" Modifier applies if a Sighting Attempt is made on a Formation of six to nine planes, a "+2" Modifier applies on a Formation of ten to nineteen planes, a "+3" Modifier applies on a Formation of twenty or more planes.

D. GAME USE OF THE SIGHTING RULES: The fact that the two sides are considered not to have seen each other at the start of a game is simulated by having all orders plotted in advance, to prevent reactions to each other's moves.

1. Orders must be plotted six Turns in advance. At game's start, players plot orders for Turns One through Six. During the Order Plot Phase of Turn One, the orders for Turn Seven are plotted, etc.

2. As soon as an opposing unit or units is "seen" by a unit, all excess orders for that unit may be erased (including those for the current Turn), and normal Turn by Turn order writing started.

3. No unit may fire at a target which it has not yet "seen". Until something has been "seen" by a plane, it cannot exceed its Maximum Level Speed.

IV. MOVEMENT OPTIONS

Parts of this section are needed only in certain circumstances, while others expand the movement capabilities found in the Basic and Advanced Game Rules.

A. LOADED PLANES — JETTISONING: Planes can carry Loads of Bombs, Cameras, etc. into the air for use on specific missions. The scenarios specify when these planes are Loaded, and the types of Loads they carry.

1. POSSIBLE LOADS AND LIMITATIONS: The Load section of the Data Cards shows what possible Loads each plane can carry. With the exception of Grenades, a plane may carry only one type of Load. *For example, if Cameras are carried, no other types of Load can be carried. If "1" Bomb is carried, no "2" Bombs can be carried, etc.* Grenades may be carried alone or in addition to a full Load of "1" or "2" Bombs. When using a Loaded plane, check its Special Rules on its Data Card. Some planes require a revision of Gun armaments with some or all Loads. At the start of a game mark a plane's Load in the "Load" section of its Combat Unit Column. *For example, two 3s marked there would indicate that the plane carries two "3" Bombs, etc.* These can be marked off as they are Dropped or Jettisoned. Where a Bomb Load is cut in half on some Variants, round all fractions up.

2. LOADED PLANE MOVEMENT: The modifications of movement characteristics for a Loaded plane are found on the "Loaded" line at the bottom of the Plane Movement Characteristics Chart on its Data Card. These apply to all types of Loads, except for Grenades only, or if stated otherwise on the Data Card. A plane carrying *only* Grenades, and no other type of Load is not considered to be Loaded for this purpose. For some planes, as stated on their Data Cards ("Flies as if Loaded"),

certain Gun armaments or armor may also make the Loaded Modifiers apply. Data Card 41 is used as an example to illustrate the effects of Loaded Modifiers on a plane's movement characteristics. Please examine that Data Card while reading the following:

a. LOADED SPEED INCREMENTS: The numbers in each Speed Increment are changed by the Modifiers.

(1) The Stall Speed Increment is changed by "+1". *For example, the Stall Speed Increment at "1-100" Altitude Levels is increased from "1-2" to "1-3".*

(2) The Level Speed Increment is changed by "-1". *For example, the Level Speed Increment at "1-100" Altitude Levels is decreased from "3-7" to "3-6". Since the Stall Speed Increment was increased to "1-3", this will actually decrease the Level Speed Increment to "4-6", to remain above the modified Stall Speed Increment.*

(3) The Dive Speed Increment is changed by "-1". *For example, the Dive Speed Increment at "1-100" Altitude Levels is decreased from "8" to "7".*

(4) As a result of the Loaded Modifiers, at some Altitude Levels a Speed Increment may disappear completely. *For example, at "701-800" and "801-850" Altitude Levels, the Level Speed Increment disappears. In effect, this means that the Ceiling is "700" Altitude Levels while the plane is Loaded.*

b. SPEED CHANGES: Being Loaded has no effects on the Brake or Power Factors.

c. ALTITUDE CHANGES: The number of Altitude Levels a plane can Climb or Dive is changed by the Load Modifiers.

(1) The Normal Climb Rate Number is changed by "-1". *For example, the Normal climb Rate Number at "1-100" Altitude Levels is decreased from "3" to "2".* If the Normal Climb Rate number is a fraction, and the number is reduced by one, add one to the fraction's divisor. If the Normal Climb Rate number is a fraction, and the number is reduced by two, add two to the fraction's divisor, etc.

(2) Zoom Climbs are Prohibited ("P") while the plane is Loaded.

(3) The Dive Rate number is changed by "-3". *For example, the Dive Rate number at "1-100" Altitude Levels is decreased from "16" to "13".*

d. BASIC AND ADVANCED MANEUVERS: The number of hexes that must be moved before a Maneuver is executed is increased, or the Maneuver is Prohibited ("P") when the plane is Loaded.

(1) If the Load Modifier is a number, simply add that number to the number found in the column. *For example, the Level Speed Turn number at "1-100" Altitude Levels is increased from "3" to "5".*

(2) If the Loaded Modifier is "P", treat the plane as if it had all "Xs" in that column.

(3) On some Data Cards, the Special Rules section contains additional rules for planes while they are Loaded.

(4) Snap and Spin Maneuvers are Prohibited for Loaded planes. If these Maneuvers are performed, the plane is automatically destroyed and removed from play.

3. JETTISONING LOADS AND GUNS: Loads and Guns can be Jettisoned. This is indicated by plotting either Jettison Load ("JTL") or Jettison Guns ("JTG"). Announce when this is done, and mark off on the plane's Hit Record. To perform a Jettison order, the plane must be in an Upright Bank Attitude, and a Crewman whose number is listed under the word "Load" on the Data Card must be available. (i.e. not firing Guns, Reloading, or Clearing Gun Jams). A Jettison order is executed on the mapboard as a Straight Ahead Maneuver, one Speed Factor is expended, and there is no loss of Speed Factors to the next Turn's Initial Speed.

a. VOLUNTARY JETTISONING: A player may voluntarily decide to Jettison whenever desired.

b. FORCED JETTISONING: Whenever a Loaded plane's Power Factor is reduced to "0", the Load must be Jettisoned, Dropped, or fired during the Turn following the reduction of the Power Factor. If no Jettisoning occurs (and it is not always possible) at this time, the Engine must be turned "off", and the Engine Off rules apply.

(1) Only Flexible Guns can be Jettisoned. Fixed Guns cannot be Jettisoned.

(2) All Jettisoned Loads automatically "miss". Cameras may be Jettisoned.

(3) SPECIAL NOTE: In some cases, Diving to a lower Altitude Level where the Power Factor is larger can avoid the need to Jettison, although the Engine must remain "off" until this is done.

B. EXCEEDING PLANE STRENGTH LIMITS: World War I planes, fragile as they seem to us, could sometimes hold together remarkably well under extreme stress. The *Exceeding Limits Tables* on the Game Card are used to see if a plane can survive situations that would normally be expected to destroy it. These situations are resolved as soon as they occur, regardless of the Phase. The following procedure is followed, using the *Exceeding Limits Tables.*

1. EXCEEDING LIMITS SITUATIONS: Find the correct column to use with the situation being resolved.

a. EXCESS DIVE SPEED: The four columns in this section are used when a plane exceeds its Maximum Dive Speed. Select the column that applies, depending on the speed. *For example, a plane with a Maximum Dive Speed of "7", that has a new Initial Speed of "9", would require use of the column headed "+2", as the Maximum Dive Speed is exceeded by two Speed Factors.* This resolution is done instead of the plane being automatically destroyed for exceeding its Maximum Dive Speed.

b. STRUCTURAL WEAKNESSES: The five columns in this section are used in a variety of situations where a plane's structural weaknesses are involved.

(1) ✪ : Planes that have this star in the Advanced Maneuvers section on their Data Cards are, in addition to being unable to perform Snap Maneuvers, in danger whenever any Advanced or Spin Maneuver is performed. Resolution is done using this column whenever an Advanced or Spin Maneuver is executed (i.e. each time the letter notations are plotted).

(2) 1/2 S or 1/2 W: These columns are used, respectively, whenever a plane with half or more of its Structure ("S") or Wing ("W") hits marked off executes an Advanced, Snap, or Spin Maneuver. Roll twice and use both results if a Snap Advanced Maneuver is executed. This resolution is done instead of the plane being automatically destroyed for executing these Maneuvers.

(3) 1T or 2T: These columns are used, respectively, whenever a plane with one or two Control ("T") hits marked off executes an Advanced, Snap, or Spin Maneuver. Roll twice and use both results if a Snap Advanced Maneuver is executed. This resolution is done instead of the plane being automatically destroyed for executing these Maneuvers.

c. SPECIAL RULES: On some Data Cards, the Special Rules section states "Wing failures", usually during some specified period of time. This indicates that the historic plane was involved in a number of accidents relating to structural weaknesses. If this is the case, treat these planes as if the Maximum Dive Speed is exceeded by "+1" every time the plane has a new Initial Speed that falls in the Dive Speed Increment. Planes may wish to determine a specific month in which their game takes place to see if these apply — this can be done by mutual agreement.

d. MULTIPLE SITUATIONS: If more than one situation applies, separate dice rolls are made for each, and all results applied.

2. EXCEEDING LIMITS EFFECTS: Crossgrid the dice roll with the proper column on the Exceeding Limits Tables to find the results.

a. NE: No effect. The plane survives without further damage.

b. S, T, or W: The number of times these letters appear is the number of Structure ("S"), Control ("T"), or Wing ("W") hits that must be marked on the plane. These hits have the normal effects.

c. D: Plane and all Crewmen are destroyed. The situation overstressed the plane, and it fell apart in the air.

3. SPECIAL NOTE ON EXCESS DIVE SPEEDS: If this rule is used, it is possible for a few planes with Maximum Dive Speeds of "10" to actually move at a speed of up to "13", if they survive. The Combat Unit Columns have only ten Impulse Columns for plotting orders. In those rare cases where eleven, twelve, or thirteen Impulse Columns are needed to plot a Turn, these extras must be plotted on a separate piece of scratch paper, or in the columns of some unused Combat Unit Column.

C. LANDINGS AND TAKE OFFS — THE GROUND MOVEMENT OF PLANES: Planes can Land and Take Off from Landing Fields, and move along the surface before or after doing so. All planes must use Landing Fields, unless the Special Rules section of their Data Card states, "Can take off and land only from water", in which case it is a Seaplane built for use on water.

1. LANDINGS: To Land, a plane must complete a Turn in a hex containing a Landing Field unit, with a new Initial Altitude that equals the Ground Altitude Level in that hex, and with a new Initial Speed that equals its Maximum Stall Speed. It must also be in an Upright Level Bank Attitude. It is considered to be Landed if all this is done; otherwise, it is considered to be a Crash Landing. Rules for Seaplanes are the same, but they may Land in any hex defined to be water. Planes with Engines Off may make Landings in Landing Field Hexes, instead of Crash Landings. Any number of planes may Land in the same hex at the same time — they do not Collide when Landed.

2. TAKE OFFS: Any number of planes may Take Off at the same time and from the Landing Field (or water) hex, provided that they end their first "flying" Turn at different Altitude Levels and/or in different hexes.

a. PREPARATIONS FOR TAKE OFFS: No plane on the ground can start to Take Off until its Engine or Engines have been started.

(1) PLANE READINESS: Plane readiness is determined when the scenario is Set Up. "Started" means that all of a plane's Engines are "on", and the plane can immediately start to Take Off. "Ready" means that most preparations for starting the Engines are completed, but they are not yet "on". "Unready" means that almost nothing has been done, and the Engines are all "off". The Engines on both Ready and Unready planes must be started before they can start to Take Off.

(2) ENGINE START PROCEDURE: Attempts to start Engines are made during the Special Events Phase by using the *Take Off Tables* on the Game Card. Find the correct column for both the plane's type of Engines and its degree of readiness. Cross-grid the number rolled with the column to find the results. One dice roll per plane per Turn is allowed. If the result is "Start", *all* of the plane's Engines are started, and the plane can start Taking Off on the next Turn. If the result is "No", the attempt has failed for the Turn.

b. TAKE OFF PROCEDURE: During a Take Off, a plane must move through an unbroken row of undestroyed Landing Field hexes.

(1) On the first Turn when the Engines are running, one Power Factor may be applied to give the plane a new Initial Speed for the next Turn of "1". On each following Turn, one additional Power Factor may be applied to add to the Initial Speed as long as the plane remains on Landing Field hexes. Any legal number of Brake Factors may be applied during a Turn, if the player desires to slow down and stop the Take Off procedure. The Plane unit is moved Straight Ahead along the Landing Field hexes at its current Initial Speed (mark "1" for each hex entered, with the same execution as if the plane was "flying"), but does not perform Spin Maneuvers, as it is still on the ground (or water). While on the ground, only an Upright Level Bank Attitude is allowed.

(2) On the first Turn that the Initial Speed exceeds the Maximum Stall Speed, the plane is considered to be "flying". Climbs and normal movements may be plotted on this Turn.

3. PLANE GROUND MOVEMENTS: These rules apply to the movements of Plane units on the ground (or water, for Seaplanes), other than during Take Off procedure.

a. If the Engines are not Started, the plane cannot be moved.

b. When the Engines are running, a plane not following Take Off procedure, or moving into hexes that do not contain an undestroyed Landing Field hex may not safely have an Initial Speed exceeding "1" (plotted and executed normally, and not performing Spin Maneuvers) — each hex entered in excess of this Initial Speed will require a dice roll on the Crash Landing Tables for possible damage or destruction. Only an Upright Level Bank Attitude is allowed on the ground.

c. Instead of a plot of "1", such planes may have a Turn Maneuver plotted. In this case, no dashes are required prior to the letter notation, but, otherwise, Speed Factor expenditure and loss is normal. A Power Factor may be used to counteract the speed loss from a Turn maneuver or to increase speed during Ground Movements.

D. FLYING OVER OBSTACLES: A plane that passes through a hex that is higher than the Ground Altitude Level must be at a higher Initial Altitude than the hex either at the beginning or end of the Turn. If not, a Collision occurs. Such a Collision will destroy the plane and all Crewmen. If the Collision is with a Building, Hanger, or Ship unit, one hit should be marked on these units as the result of the Collision.

E. SPIN RECOVERY PRIOR TO MID 1916: The procedures for ending a Spin Maneuver were not generally known or understood prior to mid 1916. These rules apply to games played for periods prior to mid 1916.

1. Until an attempt succeeds in ending a Spin Maneuver, a plane may *not* have its Initial Speed increased beyond its Maximum Stall Speed. Doing so will result in the immediate destruction of the plane and all Crewmen.

2. During the Special Events Phase of all Turns when a Spin Maneuver is executed, a dice roll is made. If "11-23" is rolled, the Spin may be ended on the next Turn in the normal manner. If "24" or more is rolled, repeat 1., above.

F. MOVEMENT DUE TO WIND: The Wind Direction and Wind Force are determined when the scenario is set up. These will cause all "flying" planes, Zeppelins, and Clouds to "drift" in the Wind Direction at the Wind Force speed rate.

1. Complete the normal Non-Plotted and Plotted Order Execution Phases.

2. Then, move all flying unit and Cloud units according to the Wind Direction and Wind Force. *For example, if the Wind Direction is "3", and the Wind Force is "1", all flying units are moved one hex in Direction "3" (as determined by Directional Hexagon "A").*

G. GLIDING TO SAFETY: If the Optional Battle Location set up rules are used, the location of a particular combat in relation to friendly territory is known. This becomes important when a plane loses all Engines over enemy or neutral territory, and it must be abstractly determined if the plane can "Glide" to safety. A plane Landing or Crash Landing in friendly territory is treated normally for Victory Points, but one that does so in enemy or neutral territory is treated as "destroyed" for Victory Points, because the plane and crew would be captured, interned, or otherwise completely lost.

1. How far a plane can Glide is determined through use of the "Glide/Hex" line of the "Strategic Game Information" section on the Data Cards. The numbers found on this line are called "Glide Numbers". Glide must be calculated for planes that lose all Engine use while located over enemy or neutral territory, and exit the mapboard without pursuit. A plane must exit the mapboard facing in its "Home Territory Direction". Otherwise, it is going the wrong way, and is not going to get back, and is treated as "destroyed" for Victory Points".

2. The Glide Numbers are the number of Altitude Levels the plane loses per Distance Number travelled. The plane must have enough Altitude Levels when it exits the mapboard to reach friendly territory, or it is treated as "destroyed" for Victory Points. *For example, a plane with a Glide Number of "120" loses 120 Altitude Levels per Distance Number travelled. If this plane is two Distance Numbers from friendly territory, it can Glide back only if its Altitude Level on exiting the mapboard is 2 x 120 = 240 Altitude Levels, or more. If the Distance Number is "1/2", 1/2 x 120 = 60 Altitude Levels, or more required to reach friendly territory.*

3. Which of the three Glide Numbers to use depends on the relationship of the Wind Direction to the Home Territory Direction, as shown on the *Glide Number Determination Diagram* on the Set Up Card. In this Diagram, the arrows outside of the hex show various Wind Directions, while the arrow inside the hex shows the Home Territory Direction. Use the first Glide Number for the Wind Direction labeled ①, the second Glide Number for the Wind Directions labeled ②, and the third Glide Number for the Wind Direction labeled ③.

V. GUNFIRE OPTIONS

Parts of this section are needed only in certain circumstances, while others expand the firing capabilities found in the Basic Game and Advanced Game Rules.

A. GUN JAMS — CLEARING GUN JAMS: World War I Guns were very prone to "Jam" while being fired. This was a constant source of frustration for the men involved (and for players who employ these rules).

1. GUN JAMS: Gun Jams are checked on the *Gun Jamming Tables* on the Game Card during the Gunfire Phase, whenever a Gun is fired. *Each* firing Gun is checked individually, and requires a separate dice roll.

a. BURST LENGTH: The controlling player decides how many bursts are to be fired from each firing Gun. The number selected may be "1" up to the Gun's Gun Value. Players should note that the smaller the burst number used (representing a "shorter" firing time), the smaller the chance of Jamming.

(1) Guns mounted together in the same Gun Position must be fired together, and with the same number of bursts each, unless Jamming, Gun destruction, or lack of Ammunition (in this case fire as many bursts as the Ammunition Factors will allow) makes this impossible.

(2) A Gun mounted with another Gun or Guns in the same Gun Position may be fired, even if other Guns in the Gun Position are unable to fire.

(3) All types of Cannon are treated as having a Maximum Gun Value of one burst, and, therefore, their Intended Bursts Per Gun is also always "1".

b. GUN JAMMING PROCEDURE: Under the "Intended Bursts Per Gun" column, find the section containing the number of bursts the controlling player decided to fire with the Gun (section "1", "2", or "3"). This will be the section of the *Gun Jamming Tables* used to resolve Gun Jamming for that Gun. Roll the two dice, and modify the number rolled by any Modifiers that apply. Crossgrid the modified dice roll with the "Bursts Before Jam" column to find the results, which are interpreted as follows:

(1) BROKEN: The Gun Jams before any bursts are actually fired, and the Gun has no value for the shot being made. A Broken Gun cannot be used again during the game, although it can still be destroyed by a Gun hit (being Broken does not count as damage to the plane). Circle the Gun Value number to show that a Gun is Broken. This happens only if a "natural" (unmodified) "66" is rolled.

(2) "0": The Gun Jams before any bursts are actually fired, and the Gun has no value for the shot being made.

(3) "1": The Gun Jams *after* one burst is actually fired, and the Gun has a Gun Value of one burst for the shot being made.

(4) "2": The Gun Jams *after* two bursts are actually fired, and the Gun has a Gun Value of two bursts for the shot being made.

(5) "3": The Gun Jams *after* three bursts are actually fired, and the Gun has a Gun Value of three bursts for the shot being made.

(6) NO JAM: The Gun does not Jam, and the full number of announced bursts is fired.

After the number of bursts actually fired by each Gun is determined, they are totalled normally for their shot. Mark any Jammed Guns by writing a "J" next to the Gun Value number of the Jammed Gun on the unit's Hit Record.

c. GUN JAMMING TABLES MODIFIERS: These Modifiers are cumulative in their effect on a dice roll, and apply only where applicable. Add "+1" if the firing plane's new Initial Speed is in its Dive Speed Increment; "+1" if the firing Gun is using Incendiary Ammunition; "+1" if the firing plane is in one of the Inverted Bank Attitudes; "+1" if the firing plane finished the Turn with an order notation for an Advanced Maneuver; and/or "+1" if the plane is at an Altitude Level of "600", or above. Subtract "-1" if the Crewman operating the Gun is of Experienced Quality, and/or if the Gun is on the ground or in a Ship.

2. CLEARING GUN JAMS: Once a Gun is Jammed, it cannot be fired again until the Jam is "Cleared". Clearing Gun Jam Attempts are resolved during the Non-Plotted or Plotted Order Execution Phases, whichever applies.

a. CLEAR GUN JAM ORDERS: Players normally plot the orders for Clearing Gun Jam Attempts. Such orders are effective only if a Crewman is available to operate the Gun Position involved. The order notation is "J", followed by the letter of the Gun Position in which the Attempt will be made. *For example, the notation "JA" would order a Clear Gun Jam Attempt in Gun Position "A".* If different Crewmen are Attempting to Clear Gun Jams in different Gun Positions in the same Impulse, list the letters of all the Gun Positions where the order applies. *For example, the notation "JAB" would order Clear Gun Jam Attempts in Gun Positions "A" and "B".*

(1) Clear Gun Jam orders are treated the same as Straight Ahead Maneuver orders for execution, Speed Factor expenditure, and Speed Factor loss (none).

(2) If there is a Flexible Gun unit for a Gun Position on which a Clear Gun Jam order is plotted, that unit may not be turned during that Turn.

(3) Only one Crewman may be used to make Clear Gun Jam Attempts on one Gun Position per Impulse. This Crewman could be switched (if possible) to a different Gun Position for a different Impulse.

(4) A Gun Position may *not* be fired if the last order notation for a Turn is a Clear Gun Jam order for that Gun Position.

(5) Clear Gun Jam orders may not be plotted during Turns in which the Initial Speed falls in the plane's Dive Speed Increment. Clear Gun Jam orders may not be plotted during Turns in which the Initial Bank is one of the Perpendicular or Inverted Bank Attitudes.

b. CLEAR GUN JAM ATTEMPT PROCEDURE: During the appropriate Order Execution Phase, after all mapboard movement is complete, the player announces which Gun in a Gun Position is actually involved (if any doubt exists). The two dice are rolled once for *each* Clear Gun Jam order plotted. No modifiers apply to these dice rolls.

(1) For most units, a dice roll of "11-16" will Clear a Gun Jam, and allow it to be fired again. Any other numbers rolled indicate that the Jam remains, and the Attempt failed. The "11-16" dice roll applies for all Combat unit's Guns, except for planes whose Data Card's Special Rule sections indicate a Jam Clearing Variation, and list other ranges of numbers to be used instead of "11-16" (some Gun Jams cannot be Cleared).

(2) For Gun units with no plotted orders, and all plotted Combat units other than planes, automatic (no orders plotted) Clearing Gun Jam Attempts may be made up to three times a Turn per Gun, if the unit is not turned during the Turn. The Gun may be fired that Turn if the first or second Attempt is successful, but not if the third Attempt is successful.

(3) If successful, erase the "J" next to the Gun Value number of the formerly Jammed Gun on the unit's Hit Record.

B. AMMUNITION SUPPLY, EXPENDITURE, AND RELOADING: Guns have limited supplies of ammunition, and cannot be fired once the supply is expended or destroyed. Some Guns can be reloaded, while others cannot be reloaded. The amount and type of Ammunition carried by a plane is displayed in the "Ammo" section on its Data Card.

1. AMMUNITION AVAILABILITY AND QUANTITY: Several systems were used to feed ammunition to World War I Guns. For game purposes, these will all be divided into just two types, "Belt" Guns, which usually used long ammunition belts, and cannot be reloaded, and "Magazine" Guns which used drums or strips of ammunition, short belts, or even (for Heavy Cannon) individual shells, and can be reloaded.

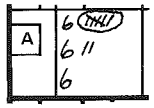
a. Ammunition that cannot be "Reloaded" during a game is shown as a single number, that number being the number of "Ammunition Factors" available for an individual Gun. If more than one Gun is located in a single Gun Position, a dash links the Ammunition Factors in the same way as the Gun Values are linked. These Ammunition Factors are already loaded into the Gun when the game starts, and, once expended, the Gun cannot be fired again during the game.

b. Ammunition that can be Reloaded during a game is shown by two numbers linked by a "X". The first number is the number of individual "Magazines" available, and the second number is the number of Ammunition Factors in each Magazine. *For example, "8 x 6" indicates that eight Magazines are available, and each holds six Ammunition Factors.* These Magazines are available for use with *any* Guns in the Gun Position or Gun Positions under which they are listed. One Magazine is considered to be already loaded into each Gun when the game starts, and all remaining Magazines are available to be Reloaded into any of these Guns during the game.

2. AMMUNITION EXPENDITURE: Any number of bursts fired by a Gun will expend an equal number of

Ammunition Factors. When all Ammunition Factors are expended, the Gun is out of ammunition, and cannot be fired again unless Reloaded. Also, when a Gun is Broken or destroyed, or the Ammunition Factors of a Gun are destroyed, the Ammunition Factors for the Gun are treated as expended. If a Gun is Reloaded before all Ammunition Factors in a Magazine are expended, treat the remaining Ammunition Factors of the discarded Magazine as if they were also expended. As shown in the sample below, Ammunition expenditure is marked with a line for each Ammunition Factor expended. As each Magazine is fully expended, circle the marks to show that they were all from the same Magazine.

THIS GUN HAS EXPENDED ALL OF ONE MAGAZINE, AND TWO MORE AMMUNITION FACTORS FROM A SECOND MAGAZINE.



3. RELOAD GUN ORDERS: Players normally plot the orders for Reloading Guns. Such orders are effective only if a Crewman is available to operate the Gun Position involved. The order notation is "G", followed by the letter of the Gun Position where the Reloading occurs. If different Crewmen are Reloading in different Gun Positions in the same Impulse, list the letters of all Gun Positions where the order applies.

a. Reload Gun orders are treated the same as Straight Ahead Maneuver orders for execution, Speed Factor expenditure, and Speed Factor loss (none).

b. If there is a Flexible Gun unit for a Gun Position on which a Reload Gun order is plotted, that unit may not be turned during that Turn.

c. Only one Crewman may be used to Reload one Gun on one Gun Position per Impulse. This Crewman could be switched (if possible) to a different Gun Position or to a different Gun for a different Impulse.

d. A Gun Position may *not* be fired if the last order notation for a Turn is a Reload Gun order for that Gun Position.

e. Reload Gun orders may not be plotted during Turns in which the Initial Speed falls in the plane's Dive Speed Increment, and/or if the Initial Bank is one of the Perpendicular or Inverted Bank Attitudes.

4. RELOAD GUN PROCEDURE: During the appropriate Order Execution Phase, after all mapboard movement is complete, the player announces which Gun in a Gun Position is actually involved (if any doubt exists). Reloading represents both removing an expended Magazine, and replacing it with a fresh one. The time required to Reload a single Gun in a Gun Position is listed in the "Reload Time" section of the plane's Data Card. The number listed there is the total number of Impulses required to complete Reloading (in some planes this varies in different Gun Positions, these Gun Positions being identified by their letters). This number of Reload Gun orders for that Gun must be plotted and executed before Reloading is complete. These orders do not have to be consecutive. Once Reloading is complete, the Gun can again be fired. NOTE: For Gun units and all Gun Positions not on planes, the time to Reload is one *complete* Turn — announce the Reloading, and mark the Ammunition.

C. COMBINED CLEARING GUN JAMS AND RELOADING: The notations and requirements for Clear Gun Jam and Reload Gun orders are very similar, and can be combined. An individual Crewman may only be used for one or the other, but as long as different Crewmen are involved, the order notations can be combined in the same Impulse Column. *For example, the notation "JAGB" orders a Clear Gun Jam Attempt in Gun Position "A" and a Reload Gun period for Gun Position "B".* This type of combined order is still treated the same as a Straight Ahead Maneuver, the same as for the individual orders. SPECIAL NOTE: Rather than make a Clear Gun Jam Attempt on a Magazine Gun, a player may decide instead to just Reload that Gun. When Reloading is complete, the Gun Jam is automatically Cleared. Only these two types of orders may be combined.

D. INCENDIARY AMMUNITION: Incendiary Ammunition was a type of round intended to start Fires on targets. Most Guns could use it, in one form or another, and some Variant Guns require its use. Incendiary Ammunition can be used against any types of targets, but, due to its reduced Range and tendency to Jam, was historically usually employed against flammable targets such as Balloons and Zeppelins.

1. A player must decide to have Incendiary Ammunition on a plane before a game starts, a decision that is completely up to the player. It is allowable to have some Guns armed with it while others are not, or to have some Magazines loaded with it while others are not. Indicate Incendiary Ammunition is carried by marking an "I" next to any Ammunition Factor that is considered to be of this type.

2. The Actual Range of Guns using Incendiary Ammunition is cut in half (round all fractions upward). Note that on Variant Guns that *require* Incendiary Ammunition to be used, the normal Range is given, so this must always be cut in half.

3. The use of Incendiary Ammunition acts as a Modifier in various situations:

a. A "+1" Modifier to the dice roll applies when checking Gun Jamming on the *Gun Jamming Tables* on the Game Card.

b. A "+1" Modifier to the dice roll applies when checking Engine, Fuel, or Gun hits on the *Special Hit Tables* on the Game Card.

c. Different hits count when firing Incendiary Ammunition at non-plane targets when using the *Hits on Non-Plane Targets Chart* on the Game Card.

4. Guns in the same Gun Position that are armed with different types of Ammunition must be fired as separate shots.

5. Cannon do not use Incendiary Ammunition.

E. STEADY SHOTS: The information necessary to use this rule is found in the "Steady Shots" sections of the Data Cards. Only planes may make "Steady Shots". A Steady Shot is simply a favorable Hit Table Modifier that can be cumulatively applied along with all other Hit Table Modifiers.

1. STEADY SHOT DEFINITION: To use the Steady Shot Hit Table Modifier of "+3", the plane must be "Steady" when a shot is made.

a. Only Guns using the "Fixed Air" section of the *Gunnery Tables* may have the Steady Shot Modifier apply.

b. The plane must end movement in its Level Speed Increment to have the Steady Shot Modifier apply.

c. The plane must end movement in one of the Upright Bank Attitudes to have the Steady Shot Modifier apply.

d. The plane must have a *consecutive* number of Straight Ahead Maneuvers ("1") plotted at the end of movement to have the Steady Shot Modifier apply. The number of consecutive "1" order plots required is equal to the *first* number listed on the Data Card of the firing plane.

2. If the Steady Shot definition applies, the Steady Shot Modifier can be applied if the Actual Range to the target unit is less than or equal to the *second* number listed on the Data Card of the firing plane.

F. CONVERGED SHOTS: This rule simulates the ability of a plane in a favorable situation to "Converge" all of its fire into one spot on a target.

1. Converged shots may be used only by planes where the Steady Shot Hit Table Modifier applies.

2. Gunfire for Converged shots is handled normally, but, instead of using the listed hits on the Hit Table after rolling the dice, count the number of hits scored. *For example, if "CESSW" is rolled, this equals five hits.*

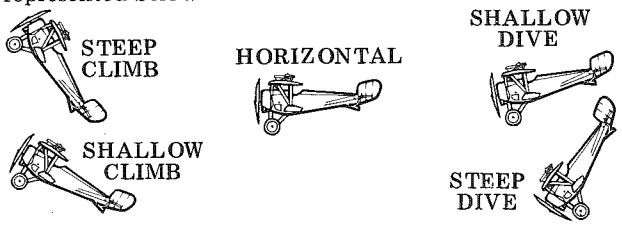
3. Now, roll the dice again, and consult the "C" ("Converged") column to the left side of the Hit Tables. This is the type of hit scored. *For example, if "13" is rolled, this is an "E" (Engine) type of hit.* All of the hits scored are marked as being this type of hit.

G. STRAFING: "Strafing" is the firing of a plane's Guns at targets that are on the surface (land or water). Whenever a plane's Guns are fired at a target unit on the surface, consider the Target Unit Clock Position for the Deflection Modifier Chart to be 6 o'clock.

H. BANK AND NOSE ATTITUDES EFFECTS ON GUN PLAY: The Gun Play Arcs covered in the Advanced Game Rules actually only apply when the plane is flying

along perfectly horizontal. The arc that a Gun Position can actually fire into will change with the Bank and Nose Attitudes of the plane.

1. NOSE ATTITUDES: The "Nose Attitudes" of a plane depend on whether it is Climbing, Diving, or neither. The five Nose Attitudes used in the game are represented below:



a. A plane's Nose Attitude at the completion of movement depends on the Altitude Change plotted for the Turn.

(1) STEEP CLIMB NOSE ATTITUDE: Any plane that exceeded its Normal Climb Rate (i.e., used all or part of its Zoom Climb number) during a Turn has this Nose Attitude.
(2) SHALLOW CLIMB NOSE ATTITUDE: Any plane that Climbed, but did not exceed its Normal Climb Rate during a Turn has this Nose Attitude.
(3) HORIZONTAL NOSE ATTITUDE: Any plane that did not Climb or Dive during a Turn has this Nose Attitude.
(4) SHALLOW DIVE NOSE ATTITUDE: Any plane that Dived nine or less Altitude Levels during a Turn has this Nose Attitude. A Dive Rate of "9", or less, is called a "Shallow Dive Rate".
(5) STEEP DIVE NOSE ATTITUDE: Any plane that Dived ten or more Altitude Levels during a Turn has this Nose Attitude. Note that some planes are incapable of being in this Nose Attitude.

b. For clarification, the *only* indication of a plane's Nose Attitude is its plotted Altitude Change. This is not indicated on the Plane unit or mapboard in any way.

2. PROCEDURE FOR DETERMINING GUN PLAY ARCS: The *Attitudes Effects on Gun Play Chart* on the Game Card is used to determine where Guns actually, face, depending on their current Bank and Nose Attitudes.

a. The Chart is in five major sections, each section for one of the Nose Attitudes. Each of these major sections is further divided into Bank Attitude (normal abbreviations used for identification) columns. You must first find the Bank Attitude column in the appropriate Nose Attitude section that currently applies to the plane.

b. Next, normally figure the Gun Play Arc into which a target unit falls, using the firing unit on the mapboard for reference. Then go down the chosen column to see if that Gun Play Arc appears (it may appear more than once, and each appearance can be checked). If it does, follow the line to either the left or right side of the Chart (whichever is closer) to find the "Standard Arc on the Gun Play Diagram". This gives the Gun Play arc of a Gun Position that can fire at the target unit with the current Nose and Bank Attitudes. *For example, a plane in a Shallow Climb Nose Attitude and an Upright Left Bank Attitude ("UL") has a target unit located in its 12 o'clock High ("12H") arc on the mapboard. Finding "12H" in the column, read across on that line to find a Standard arc of 12 o'clock Level. This means that in this Nose and Bank Attitude combination, a Gun Position with a 12 o'clock Level arc on its Gun Play Diagram can be used to fire at a target unit located on the mapboard in its 12 o'clock High arc.* Use the standard arcs found to compute the Deflection Modifiers.

3. SIGHTING ARCS: These rules also apply to the Sighting Diagram's Arcs, in the same manner as for the Gun Play Diagram Arcs.

I. TARGET IDENTIFICATION: During a hectic air battle, distinquishing friend from foe could be a problem, and mistakes were made. This rule allows the chance of firing into a friendly plane by "accident", or hitting the wrong target.

1. The Basic Game Rules that Gunfire must always be directed at the *nearest* target unit that can be fired at, and that friendly units do not block the firing are replaced. The rule now is that other, more distant, targets may be fired at, even if a closer target or friendly unit is in the same Gun Play Arc.

2. If no units are closer than an announced target unit, the shot is made normally.

3. If other units are closer, and in the same Gun Play Arc as the announced target unit, a closer unit may be fired at, instead. Roll the two dice, and consult the *Target Identification Tables* on the Game Card before resolving the shot. Crossgrid the number rolled with the column on the Tables that describes the section of the *Gunnery Tables* that will be used for the shot. If the result is "Target", the announced target unit is used. If the result is "Nearest", the nearest unit in that arc, friend or foe, is the target unit for a shot that is figured in the normal manner (the firing player is allowed to use the minimum number of bursts for the shot). If more than one unit is equally near, the firing player has the choice of which to use as a target.

4. Target Identification must be checked individually for each separate shot taken.

VI. NON-PLANE UNITS

Some scenarios require the use of units other than Plane units. The special rules that apply to each of these other types of units are covered here.

A. GUN UNITS: There are three types of Gun units, representing ground Gun Positions of various sized Guns.

1. PREPARING GUN UNIT HIT RECORDS: The Gun Unit Hit Records on a Command Sheet are used to record information about the Gun units. These Hit Records are prepared and interpreted very similarly to the Hit Records for planes.

a. IDENTIFICATION: Write the type "Type" and "Identification Number" of the Gun unit which the individual Gun Unit Hit Record will represent. "MG" is a Machingun unit. "AC" is an Automatic Cannon unit. "HG" is a Heavy Gun unit.

b. GUNS: A Gun unit may be used to represent a position containing one to three individual Guns (all of which are mounted together) of the sizes and types appropriate to the type of Gun unit. Write in the Gun Values or symbols for each Gun represented by the unit. Hits on these Guns are marked normally, and have the normal effects.

(1) All Machineguns are "(3)".
(2) All Heavy Machineguns are "(3)".
(3) All Automatic Cannon are "(CN)" — treat as "1" burst. These are Flexible Light Cannon.
(4) All "Archie" Guns are "(A)" — these never Jam.
(5) All Field Artillery Guns are "(F)".
(6) RANGES: All Machineguns and Heavy Machineguns have a Range of "12". All Automatic Cannon have a Range of "16". "Archie" Range is unlimited.

c. AMMUNITION: Ammunition Factors for these Guns are as follows:

(1) Magazine Machineguns are "6 x 3" (Reload time = 1 Turn).
(2) Belt Machineguns are "56".
(3) Heavy Machineguns are "28".
(4) Automatic Cannon are "24".
(5) "Archie" Guns must have the Limber unit placed in the same or in an adjacent hex in order to fire. There is no limit on the number of Ammunition Factors as long as the Limber unit is so placed. If the Limber unit is destroyed or moved away, the Guns in the "Archie" unit may not be fired.
(6) Field Artillery Guns do not fire. When the Heavy Gun unit is used to represent Field Artillery Guns, it is treated only as a target for this game.

d. SAMPLE GUN UNIT HIT RECORD: This Hit Record is for a Machinegun Gun unit that represents one Magazine and one Belt Machinegun.

TYPE: MG			ID. NO. 3		
C	1	3	2	3	3 —
G	A	(3)	B	(3)	C —
A		56	3 3 3 3 3 3		—

2. TURNING GUN UNITS: Although Gun units must always remain in their original hex, they can be turned. Machinegun Gun units can be turned up to two hexsides per Turn. Automatic Cannon Gun units can be turned one hexside per Turn. The Heavy Gun unit can be turn-

ed one hexside during *even* numbered Turns. All Gun units can be faced in any direction. Gun units are turned during the Non-Plotted Order Execution Phase.

3. FIRING GUN UNITS: Except for "Archie", Gun units are fired similarly to the Guns in individual Gun Positions on planes, during the Gunfire Phase.

a. MACHINEGUNS AND HEAVY MACHINEGUNS: These are fired the same as equivalent Guns on planes, but the "Ground" section of the *Gunnery Tables* is used to determine the Basic Hit Table. All Guns in a unit must be fired at the same target unit. All Hit Table Modifiers that are applicable still apply. Their Gun Play Arcs are where the Gun unit faces, Low, Level, High, and Up.

b. AUTOMATIC CANNON: These are fired the same as plane Light Cannon, but the "Ground" section of the *Gunnery Tables* is used to determine the Cannon Hit Number. All Guns in a unit must be fired at the same target unit, and all applicable Hit Table Modifiers still apply. Their Gun Play Arcs are where the Gun unit faces, Level, High, and Up.

c. "ARCHIE" GUNS: "Archie" was the World War I slang term for heavy anti-aircraft fire shell bursts. "Archie" Guns are fired totally differently from all other Guns in the game. No Hit Table Modifiers apply. The Gun Play Arc is where the Gun unit faces, High. No shots can be made except to Altitude Levels between "100" and "600" Altitude Levels *higher* than the Heavy Gun unit.

(1) Each "Archie" Gun may be fired once each Turn. Each shot must be secretly plotted on a separate sheet of scratch paper during the Order Plot Phase. To plot a shot, write down a hex number and an Altitude Level next to a Turn number. *For example, the notation "14. 1610-401" indicates Turn 14, hex "1610", and Altitude Level "401".* The Turn number is always a later one than the Turn in which it is plotted. The Turn number is for the following Turn, if the plotted Altitude Level is at four hundred or less Altitude Levels higher than the Gun unit. The Turn number is for two Turns later, if the plotted Altitude Level is over four hundred Altitude Levels higher than the Gun unit. If there are two or more Guns in the Gun unit, their shots can be directed to different hexes and/or Altitude Levels, as long as all are in the Gun Play Arc.

(2) During the "Archie" Phase of the plotted Turn, the firing player will reveal the plotted hex and Altitude Level, and any "Archie" hits will be resolved.

(3) RESOLVING "ARCHIE" HITS: An "Archie" shot is an automatic "miss" if no plane unit is in the plotted hex. A chance of an "Archie" hit exists if a plane is in the plotted hex. If a plane is in the plotted hex, and at exactly the plotted Altitude Level, hits on the plane are resolved by rolling the two dice *three* times on Hit Table "10", and marking all hits from all three rolls. If a plane is in the plotted hex, and one Altitude Higher or Lower than the plotted Altitude Level, hits on the plane are resolved by rolling the two dice *two* times on Hit Table "10", and marking all hits from both rolls. If a plane unit is in the plotted hex, and two Altitude Levels Higher or Lower than the plotted Altitude Level, hits on the plane are resolved by rolling the two dice *once*, and marking the hits.

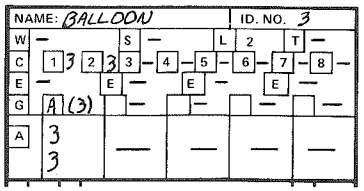
B. INFANTRY UNITS: Infantry units represent small formations of infantrymen, mainly armed with rifles. These units require no Hit Records, they have unlimited Ammunition Factors, and their Guns never Jam.

1. MOVING INFANTRY UNITS: Infantry units may be turned up to three hexsides per Turn. They may *also* enter one new hex in any direction (always Straight Ahead, if the *Solitaire Movement Tables* are used) during *even* numbered Turns. Movement and turning are handled by the controlling player during the Non-Plotted Order Execution Phase.

2. FIRING INFANTRY UNITS: Infantry units are fired similarly to a Gun on a plane, during the Gunfire Phase, but the "Ground" section of the *Gunnery Tables* is used to determine the Basic Hit Table. All applicable Hit Table Modifiers still apply. Treat Infantry units as having a Gun Value of "1". Their Gun Play Arcs are where the unit faces, Low, Level, High, and Up. Their Gun Range is "5".

C. BALLOON UNITS: Tethered balloons were used for observation by all belligerants, and were frequent targets for attacks by planes. When attacked, their ground crews would start to pull them down, and, unless armed (rare) the two balloon crewmen would Bail Out (see Option IX.) for safety from their basket below the gasbag.

1. PREPARING COMBAT UNIT COLUMNS FOR BALLOONS: The normal Hit Records are used to record information about Balloon units, as in the sample below:



2. CHANGING BALLOON ALTITUDES: A balloon will be hauled to the ground (i.e., a Dive) as soon as an attack starts. Since this was done with a winch that sometimes jammed, the controlling player has little ability to control a balloon's rate of descent.

a. During the Non-Plotted Order Execution Phase of every Turn, the controlling player rolls the two dice, and consults the "Descent" column of the "Balloon" section of the *Solitaire Movement Tables*. Crossgridding the dice roll with the column, the number of Altitude Levels Dived is found, and plotted in the Altitude Change column of the Combat Unit Column.

b. Based on the Dive, a new Initial Altitude is plotted. Only the Altitude Change and Initial Altitude columns require plotting for Balloon units.

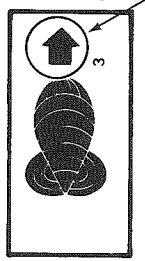
c. When the balloon reaches an Altitude Level that equals Ground Altitude Level or less, it is safely on the ground, and can no longer be attacked.

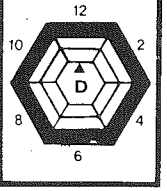
d. A Balloon is always considered to be in an Upright Level Bank and a Horizontal Nose Attitude.

3. FIRING FROM BALLOON UNITS: Few balloons carried armament, but, if carried, either Crewman can operate the Gun. This Gun is fired exactly the same as an equivalent Gun on a plane. Its Gun Characteristics are as follows:

FLEXIBLE GUN UNIT PLACED IN FRONT HEX OF BALLOON UNIT.

12 o'clock



GUN POS.	A	(3)
RANGE	8	
OPER.	Crew 1 or 2	
AMMO (OP)	2 x 3	
GUN PLAY		

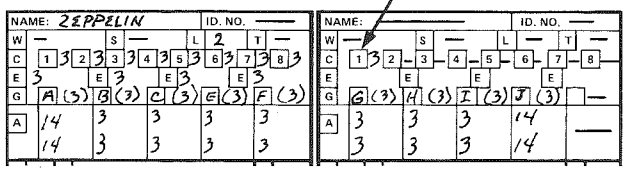
4. BALLOON DEPTH: All Balloons have a "depth" of *two* Altitude Levels. The plotted Initial Altitude for a Balloon is the Altitude Level of the *top* of the Balloon. The *bottom* of the Balloon (the location of the Gun Position) is one Altitude Level lower. A Collision with a Balloon unit could occur at either Altitude Level.

5. BALLOON SIZE MODIFIER: All Balloons have a Size Modifier of "+4".

D. THE ZEPPELIN UNIT: The unarmed Zeppelin used for the Basic Game Zeppelin Solitaire Scenario is not a representative type. Most Zeppelins were well-armed, and could be formidable opponents to early planes.

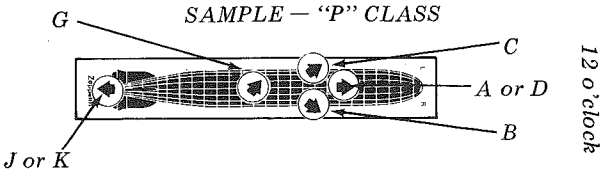
1. PREPARING COMBAT UNIT COLUMNS FOR A ZEPPELIN: Two normal Hit Records are used to record information about a Zeppelin unit, as in the sample below:

This is crew "9".



The information on the various types of Zeppelins can be found in the *Individual Zeppelin Information Chart* and the *Standard Zeppelin Data Chart* on the Set Up Card.

2. FLEXIBLE GUN UNITS: Place a Flexible gun unit on the Zeppelin unit to represent each Gun Position on the Zeppelin that can face more than one clock position. These can be initially placed facing in any desired directions (place Flexible Gun units in the proper hexes).



3. ZEPPELIN MOVEMENT AND ALTITUDES: For a Solitaire game, use the "Zepplin" section of the *Solitaire Movement Tables* during the Non-Plotted Order Execution Phase to determine all moves for the Zeppelin unit. If a player controls the Zeppelin unit, it is moved similarly to a plane, with orders plotted during the Order Plot Phase, and carried out during the Plotted Order Execution Phase.

a. A Zeppelin can be ordered to Climb or Dive up to three Altitude Levels per Turn. These are plotted normally in either one of the Altitude Change columns. No Speed gain or loss occurs as a result of an Altitude Change.

b. A Zeppelin can be turned by pivoting the Zeppelin unit on its center hex. No Bank Attitude is needed to perform a Turn Maneuver with a Zeppelin. The number of dashes that must be moved before a one hexside turn can be performed is given as the "Turn Number" for each type of Zeppelin. For a Solitaire game, Turn Maneuvers may be executed only if rolled during a Turn divisible by five (i.e., Turns 5, 10, 15, etc.). Zeppelin Turn Maneuvers count as one Speed Factor expended, but cause no loss to the next Turn's Initial Speed. A Zeppelin is always considered to be in an Upright Level Bank. Its Nose Attitude may be Shallow Climb or Dive, or Horizontal.

c. All Zeppelins have two Power and two Brake Factors available every Turn, which may be used to increase or decrease speed, the same as for a plane. A Zeppelin will never be in a Stall or Dive Speed Increment. All speeds, from "0" to its Maximum Speed are considered to be in the Level Speed Increment, and are legal for the Zeppelin unit.

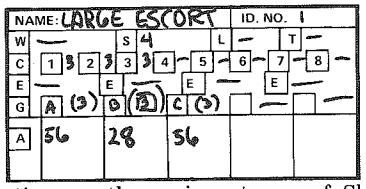
4. ZEPPELIN DEPTH: All Zeppelins have a "depth" of *three* Altitude Levels. The plotted Initial Altitude for a Zeppelin is the Altitude Level of the *top* of the Zeppelin (the location of Gun Positions "A", "B", "C", "D", "J", and "K"). The *bottom* of the Zeppelin is three Altitude Levels lower (the location of Gun Positions "E", "F", "G", "H", and "I"). A Collision with the Zeppelin unit could occur at these Altitude Levels or any in between.

5. FIRING ZEPPELIN GUNS: The Guns are fired the same as an equivalent Gun on a plane.

6. ZEPPELIN SIZE MODIFIERS: The Size Modifiers for all Zeppelin Models are listed in the *Individual Zeppelin Information Chart* on the Set Up Card.

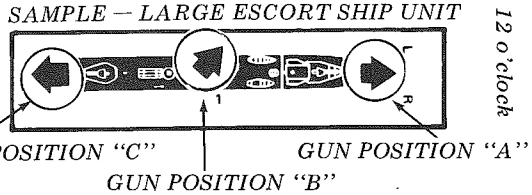
E. SHIP UNITS: The Ship units represent various types of small ships often engaged in combat with planes during World War I.

1. PREPARING COMBAT UNIT COLUMNS FOR SHIPS: The normal Hit Records are used to record information about Ship units, as in the sample below:



The information on the various types of Ships can be found in the *Ship Information Chart* on the Set Up Card.

2. FLEXIBLE GUN UNITS: Place one Flexible Gun unit on the Ship unit in *each* hex which the Ship unit occupies. These can be initially placed facing in any desired directions.



3. SHIP MOVEMENT: For a Solitaire game, use the "Ships" section of the *Solitaire Movement Tables* during the Non-Plotted Order Execution Phase to determine all moves for the Ship unit. If a player controls the Ship unit, it is moved similarly to a plane, with orders plotted during the Order Plot Phase, and carried out during the Plotted Order Execution Phase.

a. The Large Escort Ship unit can be turned by pivoting the unit on its center hex. The Escort Ship units can be turned by pivoting their bow hex, and swinging the stern hex into a new hex. The Small Escort and Submarine units are turned the same as planes, as they occupy only one hex. No Bank Attitude is needed to perform a Turn Maneuver with a Ship unit. The number of dashes that must be moved before a one hexside turn can be performed is given as the "Turn Number" for each type of Ship. For a Solitaire game, Turn Maneuvers may be executed only if rolled during a Turn divisible by three (i.e., Turn Three, Turn Six, Turn Nine, etc.). Ship Turn Maneuvers count as one Speed Factor expended, but cause no loss to the next Turn's Initial Speed.

b. All Ships have one Power and one Brake Factor available every Turn, which may be used to increase or decrease speed, the same as for a plane. All speeds, from "0" to the Ship's Maximum Speed, are legal for a Ship unit.

c. Only the Initial Speed, the Impulse Columns, and the Speed Change sections of a Combat Unit Column are needed to plot orders for a Ship unit.

d. Ship units may only move in "water" hexes. A Ship unit that enters a "land" hex has "run aground", and may not move for the rest of the game. "Running aground" causes no damage to the Ship.

4. FIRING SHIP GUNS: Treat the Guns on a Ship unit as if they were Machinegun Gun units. The only difference is that these units move with the Ship unit, instead of remaining in the same hex.

5. SHIP HEIGHT: Ship units have heights of one or two Altitude Levels, as listed in the *Ship Information Chart* on the Set Up Card.

6. SIZE MODIFIER: Ship units have Size Modifiers equal to the number of hexes the unit occupies. This Size Modifier applies only as a Sighting Modifier.

F. VEHICLE UNITS: Limber, Tank, Truck, and Wagon units are all incapable of firing at planes, but are capable of movement. No Hit Records need to be filled out for these units. For a Solitaire game, use the "Ground" section of the *Solitaire Movement Tables* during the Non-Plotted Order Execution Phase to determine all moves for a Vehicle unit. If a player controls a Vehicle unit, it is moved as desired during the Non-Plotted Order Execution Phase. All Vehicle units are considered to have an Initial Speed of "1" at the start of every Turn. This Speed Factor can be expended by making *two* or more Turn Maneuvers, by moving one hex Straight Ahead, or by making one Turn Maneuver and moving one hex Straight Ahead. The Vehicle unit may also move "0" during a Turn.

G. INSTALLATION UNITS: Installation units are all incapable of firing at planes, or of moving. No Hit Records are filled out for these units.

H. HITS ON NON-PLANE UNITS: Hits scored on Non-Plane units are handled normally, except that not all hits count. The *Hits on Non-Plane Targets Chart* on the Game Card shows which hits do count, and the number of hits of the proper type required to destroy the unit. *For example, a Truck unit requires one hit to be destroyed. If Standard Ammunition is fired at it, a "C", "E", or "F" hit will count, and destroy the unit. "S", "W", "T", "C", and "G" hits all count as "misses". If Incendiary Ammunition is fired at it, "C", "E", "L", or "F" hits will count, and destroy the unit.*

1. Gun or Infantry units in the same hex as a Trench unit are "entrenched", and require a "G" hit for the hit

to count. However, if a Trench unit is destroyed, all Gun and/or Infantry units in the same hex are also automatically destroyed.

2. On Ships, Balloons, and Zeppelins some hits (marked "*") apply to the normal hit meaning on a certain part of the target. *For example, a "G" hit would destroy a Gun.* These hits do not count towards the hits required to destroy the entire unit. All "S" and "W" hits on Ship units are treated as "S" hits. All "F", "L", and "S" hits on Zeppelin or Balloon units are treated as "L" hits.

3. Ship units where the number of "S" hits equals or exceeds one-half of the total required to destroy the unit have their Maximum Speed reduced by "1". If this reduces the Maximum Speed to "0", the Ship unit may no longer be moved.

4. Zeppelin units with half or more of their total number of Engines destroyed are reduced by one Power Factor.

5. The *Special Hit Tables* are never used for hits on Non-Plane units.

6. BALLOON AND ZEPPELIN EXPLOSIONS: Balloons and Zeppelins were filled with hydrogen, and, when destroyed, could produce a powerful explosion. For any units within an Actual Range of "2" of any part of a Balloon or Zeppelin unit when it is destroyed may receive damage from the explosion. For each of these units, roll the two dice and consult Hit Table "6" for any hits.

7. Destroyed Landing Field and Railline hexes can be noted as destroyed, or marked with inverted units.

8. One hit will destroy both hexes of a Hanger unit.

I. NON-PLANE UNIT POINTS: The Combat Point Values for the Zeppelin and Ship units are listed, respectively, in the *Individual Zeppelin Information Chart* and the *Ship Information Chart*, both on the Set Up Card, along with their Total Victory Point Values. The Total Victory Point Values for all other Non-Plane units are listed in the *Victory Point Chart* on the Game Card. If units have a Gun or Guns, their Total Victory Point and Combat Point Values are identical. Units with no Guns have no Combat Point Value. All Non-Plane units must be destroyed, not just damaged, for any Victory Points to be awarded.

VII. BOMBS, GRENADES, TORPEDOES, ROCKETS, AND SMOKE CANDLES

All of these Loads are Dropped or fired during the Plotted Order Execution Phases, although, for convenience, their resolution can be delayed until after all movement is executed. The Load a plane carries is marked in its Combat Unit Column before the game starts.

A. ORDER PLOTTING: The controlling player must plot the appropriate orders in the Impulse Column or Columns that will place the unit in a desired hex for the action to take place. The notation to "Drop" is "D", followed by notations telling what is Dropped, and how many are Dropped. "DB" means Drop Bomb, "DT" means Drop Torpedo, "DG" means Drop Grenade, and "DS" means Drop Smoke Candle. A number plotted shows how many are Dropped. Any number, from one to the whole Load may be Dropped at once. *For example, the notation "DG2" means Drop two Grenades.* Similarly, the notation to Fire Rockets is "FR". Follow this with the number of Rockets fired, which is always the total number of Rockets carried, as all must be fired at once. The selection of the right hex for plotting the orders can be very important to the chances of obtaining hits. All of these orders are executed as Straight Ahead Maneuvers, expending one Speed Factor, but causing no loss of Speed Factor to the next Turn's Initial Speed.

1. A plane must be in one of the Upright Bank Attitudes to Drop anything.

2. A Crewman Dropping the Bombs or Firing the Rockets (their identification numbers are printed under the word "Load" on the Data Cards) may not be used to operate Guns during the same Turn. If more than one Crewman can be used, any one of these Crewmen may be considered to be used for this purpose, while the others are still available to fire Guns.

B. DROPPING BOMBS AND GRENADES: Bombs and Grenades can affect only targets on the ground (or water). The Dropped Bombs or Grenades may "scatter" from the hex, and this must be checked by referring to the *Bomb Hit Location Diagram* on the Game Card. On this Diagram, the hex containing the arrow is the one containing the plane when the Drop order is executed and is called the "target hex". The three hexes to the rear of the plane's hex are the last three hexes which the plane entered (not necessarily a straight line of hexes, as shown) prior to the Drop hex, and the hex to the front of the plane's hex is the hex the Plane unit currently faces. The numbers in these hexes show where the Bombs or Grenades will fall in relation to where they were dropped, based on a dice roll.

1. HEX HIT DETERMINATION: Roll the two dice once for each Bomb or Grenade Dropped. Modify the number rolled by any applicable Modifiers. The modified dice roll determines the hex in which the Bomb or Grenade falls, based on the numbers in the hexes on the Diagram.

2. HIT LOCATION DICE ROLL MODIFIERS: These Modifiers are cumulative, and are used if they apply to modify the number rolled on the colored die.

a. POOR VISIBILITY OR OBSCURED: If the game takes place in any Poor Visibility Conditions ("-2" or "-3" Visibility Condition Modifiers), or if the target hex is obscured by Smoke, a "-1" Modifier applies to the dice roll.

b. EXPERIENCED: If the plane Dropping the Bombs or Grenades has an Experienced Quality Crewman performing the Drops, a "+1" Modifier applies to the dice roll.

c. INEXPERIENCED: If the plane Dropping the Bombs or Grenades has an Inexperienced Quality Crewman performing the Drop, a "-1" Modifier applies to the dice roll.

d. ALTITUDE MODIFIERS: The following Modifiers apply, depending on how many Altitude Levels the plane is above the target hex's Altitude Level:

(1) 1-4 Altitude Levels: +3
(2) 5-8 Altitude Levels: +2
(3) 9-20 Altitude Levels: +1
(4) 41-120 Altitude Levels: -1
(5) 121-400 Altitude Levels: -2
(6) 401+ Altitude Levels: -3

NOTE: If the surface in the hex containing the Plane unit is in a blind area from the plane, all Bombs automatically "miss".

3. BOMB DAMAGE: If no target unit is in the hex where a Bomb or Grenade falls, this is an automatic "miss". If the modified dice roll is less than "11", this is an automatic "miss". If a target unit is in the hex, the *Bomb Effects Chart* on the Game Card is consulted. This Chart shows the Hit Table Numbers to be used for Grenades and for each size of Bomb. *For example, for a Grenade ("G"), Hit Table "1" is used. For a "3" size Bomb, Hit Table "9" is used, twice.*

a. After consulting the *Bomb Effects Chart*, go to the appropriate Hit Table, and roll the dice the required number of times to find what hits are scored.

b. For Non-Plane unit targets, further consult the *Hits on Non-Plane Targets Chart* to see if the hits scored are effective, or not. All hits are marked, and/or destroyed units are removed from play.

c. If more than one possible target unit is in a hex, roll the dice on the appropriate Hit Table *separately* for each of these units.

d. Mark each hex hit by a Bomb (but not by a Grenade) with an inverted unit. With a pencil, lightly mark the Turn number when the Bomb was Dropped on the back of the unit. This indicates "Smoke" from the explosion that will "obscure" the hex for the next five Turns. Remove the unit after five more Turns have been completed. This Smoke is considered to be two Altitude Levels high, and is treated the same as Clouds for Sighting and blind area considerations to other hexes.

C. DROPPING SMOKE CANDLES OR SMOKE BOMBS: These affect only land hexes — they are worthless if Dropped in water hexes. Smoke Bombs are "2" size Bombs that must be marked as "2S" before a game starts to show that they are Smoke Bombs instead of normal "2" Bombs. Any plane that can carry "2" Size Bombs can carry an equal number of Smoke Bombs. Smoke Bombs and Smoke Candles are Dropped exactly

the same as other Bombs and Grenades, only they are intended to lay down a "Smoke Screen" instead of causing damage.

1. SMOKE CANDLES: Mark each hex in which a Smoke Candle falls with a Smoke unit (if insufficient Smoke units are available, simply invert other units and use them to mark these hexes). This indicates that the hex is covered by Smoke which will obscure the hex, and remain for the rest of the game. This Smoke is considered to be two Altitude Levels high, and is treated the same as Clouds for Sighting and blind area considerations.

2. SMOKE BOMBS: Mark each hex in which a Smoke Bomb falls with a Smoke unit, and also mark all hexes adjacent to the one hit. This indicates that these hexes are covered by Smoke which will obscure the hexes, and remain for the rest of the game. This Smoke is considered to be four Altitude Levels high, and is treated the same as Clouds for Sighting and blind area considerations.

D. DROPPING TORPEDOES: Successfully Dropping a Torpedo requires that a plane be at very low altitude, but, since the Torpedo can move independently once Dropped, the plane does not necessarily have to enter the target hex. Torpedoes may only be Dropped in water hexes, and are only effective against Ship units.

1. TORPEDO DROP ALTITUDE AND SPEED: A plane must be at an Altitude Level of no more than two higher than the Ground Altitude Level at a Speed of "4" or less, and in an Upright Level Bank Attitude to successfully Drop a Torpedo. If higher or faster or in the wrong Bank Attitude, the Drop is an automatic "miss", and a Torpedo unit is not put into play. Torpedoes are Dropped exactly like Bombs, and can "scatter". They must be dropped in "water" hexes.

2. PLACING TORPEDO UNITS: When a Torpedo is Dropped, place a Torpedo unit in the hex where it hit, with the front of the Torpedo unit facing in the same direction as the plane unit.

3. TORPEDO UNIT MOVEMENT: On the Turn following the Torpedo Drop, and on all later Turns, the Torpedo unit is moved Straight Ahead two hexes each Turn until it enters a hex containing a Ship unit, or leaves the playing area (an automatic "miss"). A Torpedo unit must move into a minimum of four hexes before it is "armed". A Torpedo unit that enters a Ship unit hex before moving this minimum distance automatically "misses". Torpedo units are moved during the Non-Plotted Order Execution Phase after Ship units are moved. Torpedo units may only move through "water" hexes. Entering a "land" hex is an automatic "miss".

4. TORPEDO HIT PROCEDURE: When an "armed" Torpedo unit enters a hex containing a Ship unit, a possible "Torpedo Hit" has been scored. For each Torpedo Hit scored, check the *Torpedo Modifiers Diagram* on the Game Card. This Diagram shows the possible angles at which a Torpedo unit can approach Ship units of various sizes, and a positive or negative Modifier Number for each approach. Roll *one* die, and add or subtract the Modifier Number to this die roll. If the modified die roll is "0", or negative, this is a "miss". If the modified die roll is positive, multiply this modified die roll times "4". This is the number of "S" hits scored on the Ship unit by the Torpedo Hit (this is displayed on the "TP" line of the *Bomb Effects Chart*, for reference).

5. TORPEDO DAMAGE: Mark the hits on the Ship's Hit Record, or, if it has been destroyed ("sunk"), remove the Ship unit from play.

6. Remove a Torpedo unit from play after it hits a Ship unit, or after a "miss".

E. FIRING ROCKETS: The Le Prieur Rocket was used by the Allies early in World War I, prior to the widescale availability of Incendiary Ammunition. These Rockets, which resemble modern rockets used in fireworks displays, were used against Balloons and Zeppelins, and affect only those units in the game.

1. ROCKET RANGE AND ARC: The maximum Range for Firing Rockets is an Actual Range of "4". The Rockets automatically "miss" if fired from a longer Range. The target unit, or a portion of it, must be in the 12 o'clock High Arc of the plane, or the Rockets will automatically "miss".

2. ROCKET FIRE PROCEDURE: If the Arc and Range are correct, there is a chance of a hit. Consult the *Rocket Firing Table* on the Game Card. Roll the two dice once for each Rocket Fired (and, all *must* be fired at once). Modify the number rolled by any applicable Modifiers. If the modified dice roll is "64", or less, the Rocket "misses". If the modified dice roll is "65", or more, the Rocket hits. One Rocket hit is automatically sufficient to destroy a Balloon or Zeppelin unit.

3. ROCKET FIRE DICE ROLL MODIFIERS: These Modifiers are cumulative, and are used if they apply to modify the number rolled on the colored die.

a. RANGE 1 OR 2: If the Actual Range is "1" or "2", a "+1" applies to the dice roll.

b. EXPERIENCED: If the Crewman firing the rockets is of Experienced Quality a "+1" applies to the dice roll.

VIII. DAMAGE OPTIONS

These options are concerned with exotic and "unlucky" types of damage. Parts A. and B. must be used together.

A. SPECIAL HITS: These rules use the *Special Hit Tables* on the Game Card, and additional dice rolls to determine the seriousness of some hits. If this Option is used, "F" ("Fire") hits on the Hit Tables are now treated as "L" ("Fuel") hits. These Tables are used only with hits on Plane units.

1. SPECIAL ENGINE HITS: For each Engine ("E") hit scored, the "Engine" section of the *Special Hit Tables* is consulted, and the two dice rolled again. The modified dice roll is crossgridded with the column describing the hit plane's Engine type (I = Inline or R = Rotary) for the results, which have the following meaning:
NE: No additional effects. The hit is handled normally.
Q: The Engine quits. The hit Engine is off, and cannot be started again during the game, with the usual Engine Off effects. Additional hits may still be marked on this Engine from later shots, until a total of "3" are marked.
QF: The Engine quits, and a Fire starts. Same as for "Q", above, only the Fire Tables (see B., below) will also be used, and all Engines must be turned off as long as the Fire continues.

2. SPECIAL FUEL HITS: For each Fuel ("L" or "F") hit scored, the "Fuel" section of the *Special Hit Tables* is consulted, and the two dice rolled again. The modified dice roll is crossgridded with the "Fuel" column for the results, which have the following meanings:
NE: No additional effects. The hit is handled normally.
F: A Fire starts. *All* Engines must be turned off, and cannot be started again during the game, with the usual Engine Off effects. The Fire Tables will also be used.

3. SPECIAL CREW HITS: This section has two parts.

a. CREW HITS: For each Crew ("C") hit scored, the "Crew" section of the *Special Hit Tables* is consulted, and the two dice rolled again. The modified dice roll is crossgridded with the "Hit" column for the results, which have the following meanings:
NE: No additional effects. The hit is handled normally.
P: The Crewman hit "passes out". As in the Advanced Game Rules, a Crewman who "passes out" is treated as eliminated in that condition, but this will normally not lead to the immediate destruction of the plane.

b. CREW RECOVERY: The "Recover" column of the "Crew" section can be used during the Special Events Phase to see if a "passed out" Crewman will "wake up". Such a Crewman can be "passed out" due to the *Special Hit Tables*, or due to a Maneuver or being in a Dive Speed Increment (see Basic Game and Advanced Game Crew hits). The dice can be rolled once per "passed out" Crewman, crossgridding the dice roll with the "Recover" column for the results, which have the following meanings:
NE: No change. The Crewman remains "passed out". Unless another Crewman can control the plane, the plane must move Straight Ahead (all "1" plots) after all previously plotted orders are properly executed, while Diving at least three Altitude Levels every Turn. No Brake Factors can be used. This continues until the Crewman "wakes up", or the plane is destroyed.
W: The Crewman "wakes up", and is no longer treated as eliminated. Note that a Crewman with two hits who "wakes up" when the plane is in the Dive Speed Increment will immediately "pass out" again.

4. SPECIAL GUN HITS: For each Gun ("G") hit scored, the "Gun" section of the *Special Hit Tables* is consulted, and the two dice rolled again. The modified dice roll is crossgridded with the "Gun" column

for the results, which have the following meanings:
NE: No additional effects. The hit is handled normally.
A: Ammunition destroyed. All Ammunition Factors available in the Gun Position are worthless for the rest of the game (mark off as if expended).
F: A Fire starts. *All* Engines must be turned off, and cannot be started again during the game, with the usual Engine Off effects. The Fire Tables will also be used.

5. SPECIAL CONTROL HITS: This section has two parts.

a. CONTROL HITS: For each Control ("T") hit scored, the "Control" section of the *Special Hit Tables* is consulted, and the two dice rolled again. The modified dice roll is crossgridded with the "Hit" column for the results, which have the following meanings:
NE: No additional effects. The hit is handled normally.
D: Plane goes into an "Uncontrollable Dive". As soon as any previously plotted orders are properly executed, the plane must move Straight Ahead (all "1" plots), while Diving at least six Altitude Levels every Turn. Brake and Power Factors may be used normally. This continues until control is recovered, the plane is destroyed, or the surface is reached.
R: Plane goes into an "Uncontrollable Roll". As soon as any previously plotted orders are properly executed, the plane must have a consecutive series of Half-Roll Maneuvers plotted for it. These Half-Roll Maneuvers must use the *minimum* number of dashes possible, without making Snap Maneuvers. Brake and Power Factors may be used normally. This continues until control is recovered, the plane is destroyed, or the surface is reached. When this result occurs, roll one die, again. If "1-3" is rolled, the Half-Roll Maneuver must be to the left, and if "4-6" is rolled, the Half-Roll Maneuver must be to the right. Note that since these are Advanced Maneuvers, Exceeding Limits will have to be checked every Turn this continues for most planes. Planes which have no Roll Maneuvers listed on their Data Card are automatically destroyed by this.

NOTE: If both "D" and "R" apply, the plane is automatically destroyed. If two "D" or two "R" apply, the plane is also automatically destroyed.

b. CONTROL RECOVERY: The "Recover" column of the "Control" section can be used during the Special Events Phase to see if an Uncontrollable Dive or Roll can be ended. The dice can be rolled once per Uncontrollable plane, crossgridding the dice roll with the "Recover" column for the results, which have the following meanings:
NE: No change. The plane remains Uncontrollable.
V: Control is regained. Normal movements can be resumed.

6. SPECIAL HIT TABLES MODIFIERS: These Modifiers are cumulative, and affect the number rolled on the colored die. These Modifiers only apply to the columns where their circled letter appears.

ⓐ SECOND + HIT: If the hit is the second or more hit on an individual Crewman, individual Engine, Fuel, or control, add "+1" to the dice roll.

ⓑ CANNON OR INCENDIARY AMMUNITION USED: If the hit was scored on an Engine, Fuel, or a Gun while firing Incendiary Ammunition or a Cannon, add "+1" to the dice roll.

B. FIRE DAMAGE AND FIRE FIGHTING: Fire could quickly consume the wood, fabric, and dope planes of World War I, and was a constant terror for the men who flew them. All aspects of Fires are found on the *Fire Tables* on the Game Card.

1. MARKING FIRES: For each, "A Fire Starts", result from the *Special Hit Tables*, the player controlling the burning plane must determine and mark the side of the plane which is burning.

a. If the Fire is caused by a hit on a part of the plane which is specifically on the right or left side of the plane, that is the side where the Fire burns.

b. If the side cannot be specifically located by the hit, roll the two dice and crossgrid the number rolled with the "Fire Side" column. This determines if the Fire is burning on the right or left side of the plane.

c. Mark the burning side by placing a Flame unit on the appropriate side of the Plane unit. Also mark an "F" somewhere on the Turn line of the plane's Combat Unit Column to show which Turn the Fire started.

d. *All* Engines must be turned off, with the usual Engine Off effects.

e. The Pilot or Pilots of a burning plane may not operate Guns. Other Crewmen may still operate Guns.

f. All Bombs, Grenades, Rockets, Torpedoes, and Smoke Candles must be Dropped, Fired, or Jettisoned on the first possible Impulse.

2. EFFECTS OF FIRES: For *each* Fire on a plane, the two dice are rolled during the Special Events Phase (including the Turn that the Fire starts) to see what damage the Fire causes. The number rolled is crossgridded with the "Fire Damage Per Turn" column. The results can be "No Damage", a hit (same abbreviations as the Hit Tables), or "Explodes" (the plane and all Crewmen are destroyed). For each separate Fire, roll the two dice once on the Turn a Fire starts, twice on the next Turn, three times on the Turn after that, etc. This continues until the plane is destroyed, the Fire is extinquished or some sort of Landing is made.

3. FIGHTING FIRES: There is a chance that a Fire can be extinquished.

a. One attempt to extinquish a Fire can be made per Turn *if* the Turn was moved at the Dive Speed Increment. One attempt can also be made for *each* Slip Maneuver completed during the Turn. The Dive Speed Increment can be used against any Fire. A Slip Maneuver can only be used against a Fire on the opposite side of the plane. *For example, a Slip Left Maneuver can only be used against a Fire on the right side of a plane.*

b. Attempts at fighting Fires are resolved during the Special Events Phase, *after* the Fire Damage for the Turn has been determined. In the "Fighting Fires" section of the *Fire Tables*, find the column that describes the Pilot Crewman with the least number of hits. The controlling player announces which Fire is involved, rolls the two dice once per attempt, crossgridding the number rolled with the appropriate column for the results, which have the following meanings:
FIRE OUT: The Fire is extinquished, and has no further effects. Remove the Flame unit. Non-burning Engines may be turned on, if the Fire Started as a result of an Engine hit.
CONTINUES: The attempt failed, and the Fire continues.

C. ARMORED PLANES: Some planes had significant armor plate protection for vital parts, as shown if the Special Rules section of the Data Card says, "armored". Whenever a hit is scored by Gunfire on one of these parts, an additional, single die roll is required to "confirm" the hit. The exact numbers needed are listed on the Data Cards. *For example, on Data Card 80, the Crew, Fuel, and Engine parts are armor plated. If a "C" (Crew) hit were scored, an additional die roll would be necessary. If "1-3" is rolled, the hit is marked normally. If "4-6" is rolled, the hit is not marked, and is ignored.*

IX. BAILING OUT

The use of parachutes to "Bail Out" of planes or Balloons is a method of reducing the number of Victory Points awarded, as well as just finding out if the Crewmen survive. Parachutes were only available to the Crewmen of Balloons of all belligerants, and to German plane Crews from February, 1918, to the end of the war.

A. Bailing Out may be attempted from any plane or Balloon that has not yet been destroyed. Bail Out attempts are resolved during the Special Events Phase. No order notation is required — the player simply announces the intention to Bail Out, and resolves it.

B. The two dice are rolled for each Crewman, individually. A Modifier of "+1" applies, if the plane is on Fire. The modified dice roll is crossgridded with the column that describes the number of "C" hits on the Crewman on the *Bailing Out Tables* on the Game Card. The results are as follows:

1. B/O: The Crewman successfully Bails Out and survives.

2. PF: The parachute fails — the Crewman is eliminated.

X. TRAINING AND EXPERIENCE — CREW QUALITY

The rules covered so far have concentrated on the quality of the equipment. The training and experience of the men using the equipment could be as or more important than the quality of their equipment. Methods of determining Crew Quality are covered in the scenarios. The Quality of Crewmen should be noted in the unit's Hit Record by marking the appropriate Rating letter next to the Crew number.

A. CREW QUALITY CHARACTERISTICS: There are three general categories of "Crew Quality". These are further divided into nine "Crew Quality Ratings". World War I flying was largely a "learn on the job" process, and each category has different rules that apply. Crewmen that are not on planes, or are not pilots can have any rules that do not apply to them ignored.

1. INEXPERIENCED QUALITY: Crewmen in this category are the worst trained and the least experienced. Crewmen of this Quality may not make Steady or Converged Shots. A "+2" Modifier applies to the dice roll for Sighting Attempts. A "-1" Modifier applies to the Bomb Hit Location dice roll. Three Crew Quality Ratings are considered to be of Inexperienced Quality, and have additional rules that apply to each.

a. "A" RATING (RAW): A "-3" Hit Table Modifier applies to all shots. No Advanced or Snap Maneuvers may be performed.

b. "B" RATING (ROOKIE): A "-2" Hit Table Modifier applies to all shots. No Advanced Maneuvers, except Skid and Half-Loop Maneuvers, may be performed. No Snap Maneuvers may be performed.

c. "C" RATING (GREEN): A "-1" Hit Table Modifier applies to all shots. No Half-Roll or Barrel Roll Maneuvers, and no Snap Maneuvers may be performed.

2. NORMAL QUALTIY: Crewmen in this category are reasonably well-trained and have some experience. Crewmen of this Quality may make Converged Shots only from an Actual Range of "1" or "2". Three Crew Quality Ratings are considered to be of Normal Quality, and have additional rules that apply to each.

a. "D" RATING (FAIR): No Snap Maneuvers may be performed.

b. "E" RATING (AVERAGE): No Snap Maneuvers, except Snap Turn Maneuvers, may be performed.

c. "F" RATING (GOOD): No Snap Advanced Maneuvers may be performed.

3. EXPERIENCED QUALITY: Crewmen in this category are the best trained and the most experienced. Crewmen of this Quality have a "-2" Modifier applied to the dice roll for Sighting Attempts. A "+1" Modifier applies to the Bomb Hit Location dice roll. A "+1" Modifier is applied to the dice roll when Firing Rockets. A "-1" Modifier applies to the dice roll for checking Gun Jams when firing. Three Crew Quality Ratings are considered to be of Experienced Quality, and have additional rules that apply to each.

a. "G" RATING (CRACK): No Snap Immelmann, Snap Half-Roll, or Snap Barrel Roll Maneuvers may be performed.

b. "H" RATING (ELITE): No Snap Half-Roll or Snap Barrel Roll Maneuvers may be performed.

c. "I" RATING (PRO): No Maneuver restrictions.

4. ACES: In addition, a Crewman (usually of Experienced Quality) may also be an "Ace". An Ace has five or more "kills" (a "kill" being an enemy plane, Balloon, or Zeppelin shot down). For every five "kills", a "+1" Hit Table Modifier applies to all shots.

5. MIXED CREW QUALTIY: A unit may have Crewmen of varying Crew Qualities, or Crew Quality Ratings. In these cases, the Quality of the Crewman actually flying the plane (the best Pilot, if there are two), operating the Gun, Dropping the Bombs, etc. determines what rules apply. For Sighting Attempts, use the best Quality Crewman.

6. FORBIDDEN MANEUVERS: If a Maneuver is plotted that the Pilot may not perform due to Crew Quality Rating, treat it as a Maneuver Improperly Plotted, and adjust the orders and movement accordingly.

B. PERSONAL CREW CHARACTERISTICS: Methods of determining Personal Crew Characteristics are covered in the scenarios. The effects of these Characteristics on play are covered below:

1. LUCK: Some people are just plain "lucky". A Crewman with this Personal Characteristic has a "-1" Modifier applied to the dice rolls for all Bail Out Attempts, all Crash Landings, and all Exceeding Limits situations.

2. EYESIGHT: Some people have superior vision. A Crewman with this Personal Characteristic (good or bad) has a "+1" or "-1" Modifier applied to the dice roll for all Sighting Attempts.

3. ACCURACY: Some people are more accurate shots than others. A Crewman with this Personal Characteristic (good or bad) has a "+2", "+1", "-1", or "-2" Hit Table Modifier applied to all shots.

4. REFLEXES: Some people have superior or inferior reflexes and natural flying ability. A Pilot Crewman with this Personal Characteristic (good or bad) may perform Maneuvers as if the Crew Quality Rating was one category better or worse than it actually is (if better or worse Ratings are listed). *For example, an "A" Rating Pilot with "+1" Reflexes could perform Maneuvers like a "B" Rating Pilot.* In all other ways, the rules for the Pilot's actual Crew Quality Rating apply.

C. EARNING CREW QUALITY: If players wish to continue using the same surviving Crewmen from game to game, they may wish to allow them to "improve" with time and experience. A Crewman may advance from Rating to Rating by gradually earning "Quality Points". When enough Quality Points have been earned, the Crewman improves enough to have the next highest Crew Quality Rating's rules apply.

1. CREW RATING QUALITY POINTS: The range of Quality Points in each Crew Quality Rating category are as follows:

INEXPERIENCED CREW RATINGS	QUALITY POINTS	NORMAL CREW RATINGS	QUALITY POINTS	EXPERIENCED CREW RATINGS	QUALITY POINTS
A	10-39	D	120-129	G	190-199
B	40-59	E	130-139	H	200-219
C	60-119	F	140-189	I	220+

2. EARNING QUALITY POINTS: Quality Points are earned for the following:

a. ENGAGE IN COMBAT: Simply participating in a game and surviving is worth three Quality Points.

b. CRASH LAND: If the Crewman survives a Crash Landing, this is worth five Quality Points.

c. SCORE "KILL": Each "kill" scored is worth ten Quality Points to the involved Crewman. "Kills" are defined as follows:

(1) A "kill" is scored for each enemy plane, Balloon, or Zeppelin destroyed or forced to Crash Land. These are the only types of "kills" that count towards producing an "Ace".
(2) A "kill" is scored if a Ship unit is destroyed.
(3) A "kill" is scored if a game objective hex, worth Victory Points, is destroyed.
(4) A "kill" is scored for every *five* Gun and/or Vehicle units destroyed. This may be over the course of a number of games.
(5) A "kill" is always given only to the *last* Crewman to hit the unit for which the "kill" is awarded. In a case where more than one Crewman is attacking the target unit simultaneously, it may be necessary to use a die roll to determine the order in which the Crewmen fire, Drop Bombs, etc.

D. RECORDING CREW CHARACTERISTICS: When the Crew Quality options are used over a series of games, the Crew Log Sheet (see Option XIV.) can prove useful for recording Crew Characteristics and Quality Points earned. Players have the permission of the author and Publisher to make copies of the Crew Log Sheet for their own use, only (not for resale). One copy is required for each Crewman.

XI. MULTI-PLAYER RULES — UMPIRED GAMES

WINGS is a game that lends itself well to play by more

than one player per side. The presence of multiple players on a side allows some additional realism to be built into the game. These are *suggested* rules for games with more than two players.

A. ASSIGNING PLANES: The players on a side should control different types of planes. That way, they will not have to "share" Data Cards, but can keep the needed Data Cards in front of them. This also permits a realistic division of responsibility, and recreates the historical problems of integrating separate commands into a common tactical plan.

B. UNIT CONTROL: Players may only control the units that they command. No other player may plot orders, help plot orders, or move units that another player controls.

C. PLAYER COMMUNICATIONS: World War I air-to-air communications were very primitive — leaders directed their formations through hand signals, wagging wings, and firing flares, none of which did much good. This is simulated as follows:

1. The players on a side may meet to discuss their strategy before the game begins. After the game starts, no further discussions are allowed. During this pre-game meeting, six small slips of scratch paper should have one message each written on them. These messages may be any the players care to devise. Each player should also select a "Personal" unit from among those he contols. This unit represents the player's personal presence on the mapboard.

2. During the game, players may communicate with other players on their side only if their Personal units are not hidden from each other by blind areas, and they are an Actual Range of "10", or less, apart. The only allowable communication is passing the pre-written message slips.

D. TIMED PLOTTING: In multi-player games, one slow player can delay everyone else, and slow down the game. To avoid this, the Order Plot and New Initials Plotting Phases should be timed. Three to five minutes for the two Phases is usually about the right period, but players can decide the time limit to suit themselves, before the game starts.

E. THE UMPIRED GAME: This Option requires the services of an extra person who will play for neither side, but will serve as "Umpire", and run the game. These rules are possible *suggestions* for the Umpire in running such a game.

1. Separate the players or teams of players so that they are out of sight of each other. Each side must have a separate copy of the game, or of the Reduced Mapboard (see Option XV.), and the Umpire must have another copy. This Option can work beautifully if all participants have a copy at their homes, and the game is played by telephone.

2. The Umpire's copy of the game should display all information, and all units for both sides should be placed or marked on this copy. Each of the other copies should display just that side's or player's information and units, plus any information about enemy units that may be supplied by the Umpire.

3. The game is played normally, although all information must go through the Umpire. Only the Umpire knows exactly where all units of both sides are located, and what types of units they are. Since the units are completely hidden, a change in the Sighting Rules is in order:

a. Orders are plotted normally, not six Turns in advance.

b. Instead of on Sighting Attempt per plane per Turn, allow one Sighting Attempt per Crewman per Turn.

c. Instead of making a Sighting Attempt on an "unseen" unit, the controlling player must select two arcs per Crewman, and inform the Umpire. If there is something in a selected arc, the Umpire handles the Sighting Attempt dice roll. If nothing is in the arc, or if the Sighting Attempt is unsuccessful, the player is told that he sees nothing. If the Sighting Attempt is successful, the player is told what is in the arc, and where. Note that if more than one unit is in the arc, the Umpire should make a Sighting Attempt dice roll for each — some may be seen, while others are not seen, and some may be seen, but not identified:

(1) If the modified dice roll exceeds the Sighting Number by "20", or less, the player is not told what types of units are seen, or their nationality.

(2) If the modified dice roll does exceed the Sighting Number by more than "20", the player is told the types and nationalities of the units.

(3) If the modified dice roll equals or is smaller than the Sighting Number, nothing is "seen".

4. The Umpire has a lot to do, and must be skilled with the rules, tactful, and able to use imagination in many situations. The Umpire should handle all dice rolls, and report the results back to the players. The exact hits scored by firing or Bombing, etc. do not have to be revealed to the player who would normally roll the dice. All players should be kept somewhat in the dark as to enemy losses, losses to friendly units, etc., and only be aware of their own losses.

F. LARGER MAPBOARDS — EXTRA SURFACE TERRAIN: For large multi-player games, players may wish to use a larger mapboard and more Surface Terrain than normal. If this is desired, note that some other Yaquinto Publications games, *PANZER*, "*88*", and *ARMOR*, have mapboard and Terrain units that could be used in addition to *WINGS* components.

XII. THE OPTIONAL SOLITAIRE RULES

A Solitaire game can never really duplicate the presence of a live opponent, but can provide interesting "practice" for face-to-face games.

A. Solitaire games can be played where the player's plane or planes attacks Zeppelins, Balloons, Installations, Ships, and other units. Movement and Altitude Changes by these units are all decided through dice rolls crossgridded with the proper section of the *Solitaire Movement Tables* during the Non-Plotted Order Execution Phase. If a dice roll calls for an impossible movement, ignore the impossible portion of the notation.

B. The player should always turn the "opposing" Gun or Flexible Gun units to those unit's *best* advantage.

C. Always take the shots with the highest possible Hit Table Number for the "opposing" Guns. Use die rolls for decision-making for these shots if equal Hit Table Numbers are available against more than one target unit.

D. If the Gun Jam Option is used, always fire "opposing" Machineguns and Heavy Machineguns at a "2" burst Gun Value.

XIII. AERIAL PHOTOGRAPHY

World War I saw the introduction of large-scale photographic reconnaissance.

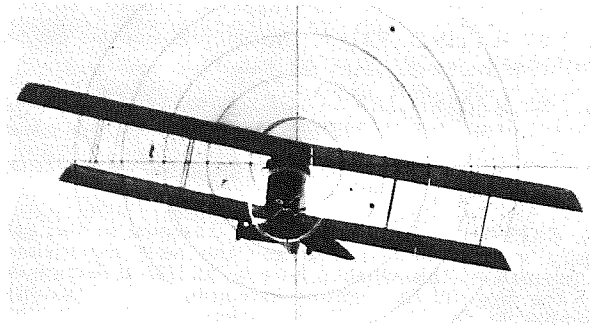
A. TAKING PHOTOGRAPHS: "Photographs" of a hex can be taken when a plane Loaded with a Camera enters the hex with Photograph ("PH") orders.

1. Photograph orders are treated the same as Straight Ahead Maneuvers for execution, Speed Factor expenditure, and Speed Factor loss (none).

2. A Crewman or Crewmen (identification numbers listed under the word "Load" on the Data Cards) operating the Camera may not be used to operate a Gun Position.

3. Photographs may only be taken if the plane is in an Upright Level Bank Attitude, a Horizontal Nose Attitude, and its Level Speed Increment.

B. SAFE RETURN: To be worth anything, Photographs must be returned home safely. This means that the Camera cannot be Jettisoned, or the plane destroyed or brought down in enemy or neutral territory.



XIV. CREW LOG SHEET

CREWMAN IDENTIFICATION:

INITIAL QUALITY POINTS:

PERSONAL CHARACTERISTICS: LUCK: EYESIGHT: ACCURACY: REFLEXES:

GAME DATE	PLANE IDENTIFICATION	QUALITY POINT AWARDS						CURRENT KILL TOTAL	CURRENT QUALITY POINT TOTAL
		ENGAGE IN COMBAT	CRASH LAND	KILLS OR PARTIAL KILLS					
		3							
		3							
		3							
		3							
		3							
		3							
		3							
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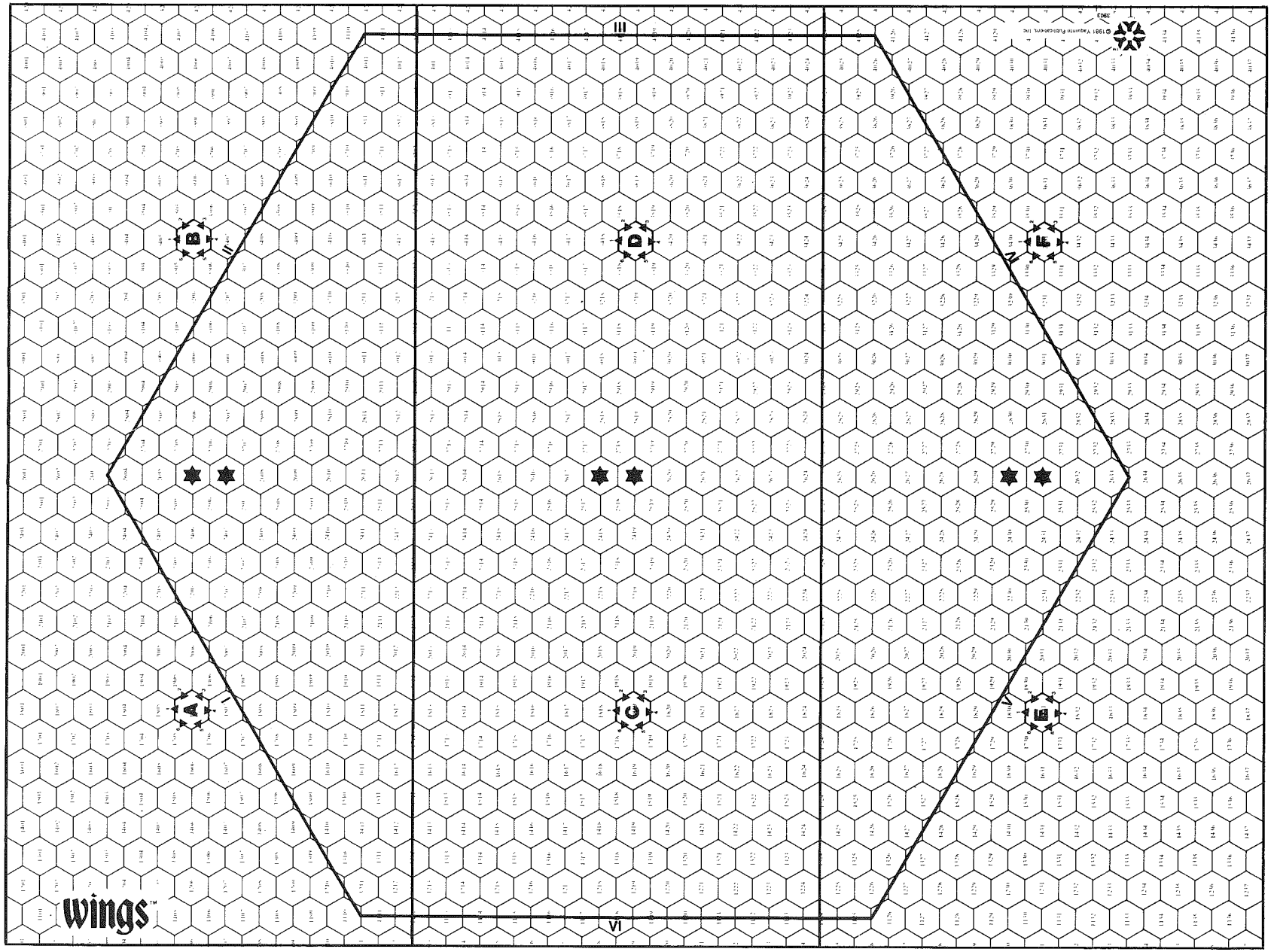
XV. REDUCED MAPBOARD



THE DUEL GAME RULES

I. INTRODUCTION TO THE DUEL GAME

The Duel Game is the most complex and detailed version of *WINGS*. Players should be very familiar with all facets of the game before attempting this version. Because of the time required to plot, execute, and resolve every Turn, it is suggested that each player control only one, or, at most, two planes in a Duel Game.

Most of the Basic and Advanced Game and Optional Rules still apply to the Duel Game, but they are changed in the way in which they are implemented, and specific changes are given below. The Sequence of Play is different for the Duel Game, and is printed on the back page of this rulebook. Simply ignore any Phases that do not apply to the rules being used in a particular game. The Duel Game is intended to give players the "feel" of being able to see what the other fellow is up to in minute detail, and make split second reactions.

II. THE DUEL GAME SIGHTING PHASE

This Phase is handled in exactly the same way as the regular Sighting Phase, covered in the Optional Rules.

III. THE DUEL GAME ORDER PLOTTING AND EXECUTION PHASE

In the Duel Game, the normal Order Plot Phase, Non-Plotted Order Execution Phase, Plotted Order Execution Phase, Gunfire Phase, and "Archie" Phase all take place during this Phase.

A. GENERAL RULES: Each Turn in the Duel Game requires the use of *three* lines on the Command Sheet. For Turn One, the "1", "2", and "3" lines are used, and are all considered to be Turn One. For Turn Two, the "4", "5", and "6" lines are used, etc.

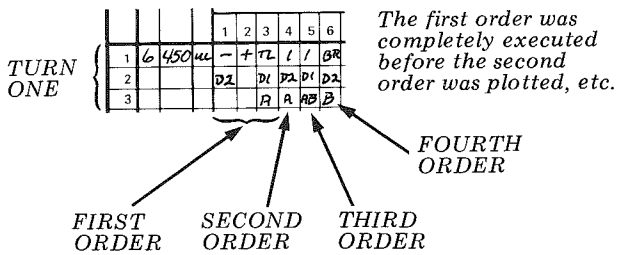
1. ORDER PLOT NOTATIONS: In the Duel Game, all Impulse Columns for a Turn are not necessarily plotted at the same time. Instead, the orders are plotted *one* order at a time. An individual order can be as short as "1", which occupies only one Impulse column, or as long as any number of dashes and/or pluses followed by a Maneuver Notation, which can occupy numerous Impulse Columns. A new order is never plotted until after the previous one has been completely executed and resolved. The normal order notations are used, and plotted in the top line of the Turn.

2. ALTITUDE CHANGE NOTATIONS: As the order notations are plotted on one line, altitude change notations are plotted in the same Impulse Columns, on the next line down. The normal notations are used.

3. FIRING NOTATIONS: As the order and altitude change notations are plotted on the top two lines, firing notations are plotted in the same Impulse Columns, on the third line. These firing notations consist of the identifying Gun Position letter or letters for the Gun Position or Positions ordered to fire. This Gunfire is resolved during the Impulse in which it is plotted.

4. PLOTTING AND EXECUTING PROCEDURE: One order, plotted on all three lines, is secretly written by all players. The Command Sheets are then revealed to all players, and moves executed on the mapboard until the plane or planes with the fewest number of Impulses plotted have completed one order. If an order requires firing, Dropping Bombs, Clearing Gun Jams, etc., these are resolved *simultaneously* before continuing. Then, another order is secretly plotted for the planes that have completed an order (no changes are made for planes that have not yet completed an order), the Command Sheets are again revealed, and moves executed on the mapboard until a plane or plane has completed an order, etc. This continues until all planes have orders plotted in the appropriate number of Impulse Columns that equal their Initial Speeds at the start of the Turn. Order notations may still be carried over into a later Turn, but must be plotted on all three lines.

5. SAMPLE ORDERS FOR ONE TURN: Below is an example of the orders plotted for one plane for one Turn:



6. VARYING INITIAL SPEEDS: Units with lower Initial Speeds are left where they are when all of their Impulses are executed, while units with higher Initial Speeds continue their plotting and execution until all of their Impulses are executed.

B. THE IMPULSE CHARTS: The *Impulse Charts* on the Game Card are used to determine exactly *when* during a Turn a certain action can occur, and *what portion* of an action can occur during each Impulse. An "action" can be a Climb or Dive Rate number, the turns of Flexible Gun or Gun units, Non-Plane units movements, Solitaire movements, movement due to the Wind Force, etc.

1. USING THE IMPULSE CHARTS: Crossgrid the line containing the number of Possible Actions that *may* take place during the Turn with the column containing a plane's Initial Speed for the Turn. A number of checks may have to be made for different Possible Actions. These checks will show what can take place for that Turn during each Impulse.

2. EXAMPLES OF IMPULSE CHART USE: The following are some examples to illustrate the uses of the *Impulse Charts*. Please examine the *Impulse Charts* in the appropriate locations while reading these examples.

a. A plane with an Initial Speed of "7" has a Normal Climb Rate of "3". Crossgrid "3" Possible Actions with the 7 column. See that one Altitude Level may be Climbed during Impulses Two, Four, and Six. Any Climb orders would have to be plotted during these Impulses, and the maximum Climb in any of these Impulses would be one Altitude Level.

b. A plane with an Initial Speed of "6" has a Maximum Dive Rate of "17". Crossgrid "17" Possible Actions with the 6 column. See that up to three Altitude Levels may be Dived during Imulses One, Two, Four, Five, and Six, and up to two Altitude Levels may be Dived during Impulse Three. Dive orders could be plotted during any of these Impulses to the number of allowable Altitude Levels for each.

c. A plane with an Initial Speed of "5" has a Flexible Gun Turning of "2". Crossgrid "2" Possible Actions with the 5 column. See that the Flexible Gun unit may be turned up to one hexside on Impulse Two, and up to one hexside on Impulse Four.

d. A plane with an Initial Speed of "4" is in a game where the Wind Force is "1". Crossgrid one Possible Action with the 4 column. See that the movement due to the Wind Force will occur on Impulse Three.

C. SPECIFIC ORDER EXECUTION RULES: These are changes in the regular rules required for the Duel Game.

1. BANK UNITS: The Bank units are moved on the Plane units to show changes in Bank Attitudes as they occur, instead of adjusting them at the end of the Turn.

2. COLLISIONS AND LANDINGS: Planes that are in the same hex and at the same Altitude Level during the same Impulse will Collide, and the Collision must be resolved at that time. The Altitude Level of a plane and the Altitude Level of the surface in the hex currently occupied must be considered every Impulse to determine Collisions with the ground. Normal or Crash Landings may take place and/or be resolved during any Impulse when a plane's Altitude Level and the Ground Altitude Level are the same.

D. SPECIFIC ALTITUDE CHANGE AND NOSE ATTITUDE RULES: These are changes in the regular rules required for the Duel Game.

1. NOSE ATTITUDE DETERMINATION AND CHANGES: As the Bank Attitude can change from Impulse to Impulse, so a plane's Nose Attitude may change during a Turn.

a. VARIABLE NOSE ATTITUDES: The numbers found in the Impulse Columns on the *Impulse Charts* merely tell when an action can occur, and the maximum number of such an action that can occur in a specific

Impulse. The plotted orders do not necessarily have to include notations during every possible Impulse. *For example, for a plane that can Climb one Altitude Level each on Impulses One, Three, and Five, the player may choose to plot an Altitude Level Climb during none of these Impulses, any one or two of these Impulses, or during all three of these Impluses.* The decision does not have to be made until each particular Impulse Column has to be plotted. A plane may still not be ordered to Climb and Dive during the same Turn.

(1) HORIZONTAL NOSE ATTITUDE: During all Impulses of a Turn before a Climb or Dive notation is plotted, a plane's Nose Attitude is considered to be Horizontal.

(2) SHALLOW AND STEEP CLIMB NOSE ATTITUDES: A plane is in a Shallow Climb Nose Attitude when using its Normal Climb Rate. A plane is in a Steep Climb Nose Attitude when using its Maximum Climb Rate. *For example, a plane with an Initial Speed of "5" has a Normal Climb Rate of "2", and a Maximum Climb Rate of "3". If the Normal Climb Rate is used, the plane can be Climbed one Altitude Level each on Impulses Two and/or Four, and is in a Shallow Climb Nose Attitude. If the Maximum Climb Rate is used, the plane can be Climbed one Altitude Level each on Impulses One, Three, and Five, and is in a Steep Climb Nose Attitude.* A plane may use only the Normal or the Maximum Climb Rate during any one Turn, not both. Once the first Climb notation is plotted during a Turn, the plane remains in the Nose Attitude determined by that plot for the rest of the Turn, and any additional Climb notations that can be plotted during the Turn are based on which Climb Rate was used for the first Climb notation. Regardless of the number of Climbs actually plotted, the Climb Rate Fraction is used to determine how much speed is lost if the Normal Climb Rate is used, and the Zoom Climb Rate Fraction is used to determine how much speed is lost if the Maximum Climb Rate is used. Speed loss is still based on the number of Altitude Levels of Climb that were actually plotted during the entire Turn.

(3) SHALLOW AND STEEP DIVE NOSE ATTITUDES: A plane is in a Shallow Dive Nose Attitude when using its Shallow Dive Rate (nine or less Altitude Levels per Turn), and in a Steep Dive Nose Attitude when using its Maximum Dive Rate (10 or more Altitude Levels per Turn). A plane may use only the Shallow or the Maximum Dive Rate during any one Turn, not both. Once the first Dive notation is plotted during a Turn, the plane remains in the Nose Attitude determined by that plot for the rest of the Turn, and any additional Dive notations that can be plotted during the Turn are based on which Dive Rate was used for the first Dive notation. Speed gain from Diving is still based on the number of Altitude Levels of Dive that were actually plotted during the entire Turn.

b. NOSE ATTITUDE NOTATIONS: Marking the Nose Attitude provides a convenient reference, and is sometimes necessary when the numbers are the same in the same Impulse Columns on the *Impluse Charts*. Circle a Climb notation to indicate a Steep Climb Nose Attitude (and, therefore, the use of the Maximum Climb Rate). An uncircled Climb notation indicates a Shallow Climb Nose Attitude (and, therefore, the use of the Normal Climb Rate). Similarly, a circled Dive notation indicates a Steep Dive Nose Attitude, and an uncircled Dive notation indicates a Shallow Dive Nose Attitude.

2. ALTITUDE CHANGES REQURIED BY MANEUVERS: Some Maneuvers require an altitude change in order to be executed.

a. DIVING HALF-LOOPS AND IMMELMANNS: The required number of Altitude Levels to be Dived to perform these Maneuvers must be plotted in the same Impulse Columns as the dashes, pluses, and order notation of the Maneuver. These required Altitude Levels must be incorporated in Dive notations plotted during these specific Impulses, rather than during the Turn as a whole.

b. CLIMBING HALF-LOOPS AND IMMELMANNS: The Maximum Climb Rate *must* be used during any Turn or Turns in which one or more of these Maneuvers is completely or partially plotted. The maximum number of Altitude Levels possible must be Climbed in the same Impulse Columns as the dashes, pluses, and order notation of the Maneuver. *For example, a plane with an Initial Speed of "5" has a "H-LP/Immel" Maneuver number of "3", and a Maximum Climb Rate of "6". If the Maneuver is plotted on Impulses Two through Five, the plane is required to Climb the maximum number of Altitude Levels possible during these Impulses. In this case, it would be "C1", "C2", "C1", and "C1", as those are the numbers found for Impulses Two through Five found for "6" Possible Actions crossgridded with an Initial Speed of* 5 . This requirement replaces the rule requiring planes performing these Maneuvers to Climb a number of Altitude Levels equal to the Zoom Climb number. These required Altitude Levels must be incorporated in Climb notations plotted during these specific Impulses, rather than during the Turn as a whole.

c. DIVING DURING SLIPS: The required three Altitude Levels to be Dived to perform a Slip Maneuver must be plotted in the same Impulse Columns as the dashes, pluses, and order notation of the Maneuver, rather than during the Turn as a whole.

E. SPECIFIC GUNFIRE RULES: These are changes in the regular rules required for the Duel Game. Orders for Guns to fire must be plotted when an entire order is plotted. During the plotted Impulse, the plotted Gun Positions must be fired, even if no target is available. Planes may now fire during any Impulses, rather than just at the end of the Turn. The controlling player decides when to fire, not the *Impulse Charts*.

1. FIRING RESTRICTIONS: The restrictions on firing that applied at the end of a Turn, now apply during each Impulse. No Guns on a plane may be fired during an Impulse with a dash or plus plot. Crewmen otherwise involved may not be used to fire Guns during an Impulse with "Drop", "Fire Rocket", "Clear Gun Jam", "Reload Gun", or "Jettison" orders plotted.

a. GUN VALUE RESTRICTIONS: During any one Turn, no Gun may be fired more bursts than its Gun Value. Cannon and Infantry, having only one burst, may only be fired once per Turn.

b. BURST RESTRICTIONS: No Gun may be fired more than one burst per Impulse. The number of consecutive Impulses that a Gun may fire may not exceed its Gun Value, even if the consecutive Impulses are on different Turns. *For example, a Gun with a Gun Value of "3" that fired one burst each during the last three Impulses of a Turn could not be fired during the first Impulse of the next Turn.*

2. GUNFIRE DETERMINATION AND PROCEDURE: The Gunfire Determination methods and the Gunfire Procedures are not changed, except that now all altitude differences, Nose and Bank Attitudes, Deflections, etc., are calculated based on the Impulse in which the firing takes place. Use the Initial Speed of the Turn being plotted (instead of the Initial Speed for the next Turn), and all current Attitudes when making a shot.

3. GUN JAMMING: For *any* firing Impulse which is *not* consecutive (i.e. there was no firing by the Gun during the previous Impulse), use the "1" section of the "Intended Bursts Per Gun" column on the *Gun Jamming Tables*. This is resolved normally. For the second consecutive firing Impulse for a Gun, use the "2" section. For the third consecutive firing Impulse for a Gun, use the "3" section. If a "0" or "1" result is rolled during a second consecutive Impulse, the Gun is considered to have Jammed after the first firing Impulse, and the Gun has no value for the shot made. If a "0", "1", or "2" result is rolled during a third consecutive firing Impulse, the Gun is considered to have Jammed after the second firing Impulse, and the Gun has no value for the shot being made.

F. SPECIFIC NON-PLOTTED ORDER RULES: Since there is no Non-Plotted Order Execution Phase in the Duel Game, these orders must be executed during the Duel Game Order Plotting and Execution Phase.

1. FLEXIBLE GUN UNITS: Flexible Gun units on planes are turned *before* any plotted orders for an Impulse are executed, and only during Impulses determined by the *Impulse Charts*. They may not be turned later during a Turn in which Clear Gun Jam or Reload Gun orders were plotted for them in an earlier Impulse.

2. NON-PLANE UNITS: These units are turned and/or moved *before* any plotted orders for an Impulse are executed. They are turned and/or moved during Impulses determined by crossgridding the unit's total number of actions (moves and turns) with the Initial Speed of the plane in the game with the *highest* Initial Speed for that Turn. These units may be fired during any of these Impulses, even those in which no moving or turning takes place.

3. SOLITAIRE FIRING: Units providing opposition in a Solitaire game may only be fired during Impulses determined by crossgridding the Gun's total number of bursts with the Initial Speed of the plane in the game with the highest Initial Speed for that Turn.

G. "ARCHIE" RULES: "Archie" is handled normally, except that it is now resolved during a specific Impulse during the Duel Game Order Plotting and Execution Phase, instead of during a separate "Archie" Phase.

1. "Archie" shots are still plotted on a separate sheet of paper and for a later Turn. They are always plotted at the same time as the first Impulse of a Turn is being plotted.

2. An "Archie" plot must now include the Impulse on which it will be resolved. Any Impulse may be selected. *For example, the notation "12. 1120-502(3)" indicates Turn 12, hex "1120", Altitude Level 502, on Impulse Three of that Turn.* The "Archie" shot is resolved after the units have been moved for that Impulse.

IV. THE DUEL GAME END TURN PLOTTING PHASE

After all Impulses of a Turn have been executed and resolved, the players must calculate and plot the information for the New Initials for the next Turn.

A. SPEED CHANGES: All Power or Brake Factors to be used are plotted in the Speed Changes column.

B. NEW INITIALS: Based on the changes that took place during the Turn just completed, the New Initials are calculated and plotted.

V. THE DUEL GAME SPECIAL EVENTS PHASE

This Phase is handled in exactly the same way as the regular Special Events Phase.

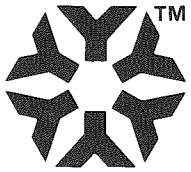
VI. OPTIONAL IMPULSE SEQUENCING

Players may employ this rule, if they wish, instead of using the Varying Initial Speeds rule (Duel Game, III. A.6.). Before a Turn begins, determine which plane or planes have the highest Initial Speed. These planes will have orders plotted in all Impulse Columns up to the number of their Initial Speed, as the Turn progresses. For the slower planes, crossgrid their Initial Speeds as a number of Possible Actions with this highest Initial Speed. The results will show on which Impulses these slower planes may have orders plotted. *For example, if the highest Initial Speed is "8", a plane with an Initial Speed of "5" could have orders plotted only during Impulses One, Three, Five, Six, and Eight.*

A. For convenience, mark an "X" in those Impulse Columns that will not be used. Plotted Impulses separated by one or more "X" marks are still considered to be consecutive.

B. Units are moved only during Impulses for which they have orders plotted. They remain where they are during Impulses when an "X" is plotted.

C. The determination of "X" Impulse Columns may cause some erasing and rewriting to properly plot orders that had carried over from the previous Turn.



THE MASS GAME RULES

I. INTRODUCTION TO THE MASS GAME RULES

These rules have little to do with the other sections of this rulebook, and other rules do not apply unless specifically stated to do so. Dice rolls are handled as explained earlier, and only the Point Values, Notes, and Mass Game Information sections of the Data Cards are used. The Mass Game uses its own scenario, and no others are used. The Mass Game is intended to provide an abstract game — a simple and fun set of rules that enables players to refight the mass dogfights that were a feature of World War I. The Mass Rules enable players to easily and quickly handle large numbers of planes. Two, or more, players can participate, with each player controlling six to twenty-four individual planes.

II. MASS GAME SET UP AND PREPARATION FOR PLAY

A. SELECTION OF SIDES: Players decide by dice rolls or any other agreeable means which player or players will be on which sides, the time period and location of the action (to decide which planes are available for use), and the number of planes to be used (which should total roughly the same number of Combat Point Values on both sides).

1. The planes on each side should then be divided into three roughly equal size groups of planes, called "Squadrons". Each Squadron should then be given a separate letter designation, and the Sequence units with these *same* letters found and placed on the table.

2. Each Squadron should then be further divided into roughly equal size groups of three to six planes each, referred to as "Flights". Depending on the size of the game, there can be one to three Flights in each Squadron. If necessary to avoid confusion, make a note of what planes are in which Squadrons and Flights. Generally, have planes of the same type in one Flight.

B. MAPBOARD SET UP: The mapboard sections are placed in the Standard Edge-to-Edge alignment.

1. The players place the Cloud units in any agreeable manner on the mapboard. Only the Cloud units that occupy three or more hexes are used. Treat the hollow centers of the circular Cloud units as if they were part of the Cloud unit. These Cloud units are defined to occupy Altitude Levels three through six in their hexes.

2. Any player may roll one die. The Direction Arrow on the Sun unit is then placed to face in that hexside direction, in any convenient hex on the mapboard.

C. PLANE UNIT SET UP: The six Sequence units are now inverted, and thoroughly mixed. They are then drawn by any player, and their identifying letter shown. After a Sequence unit is drawn, the player with the Squadron identified by that letter must complete setting up the Plane units in that Squadron before another Sequence unit is drawn.

1. SQUADRON SET UP PROCEDURE: When a Sequence unit is drawn and exposed, the player controlling the corresponding Squadron must set up all of the Plane units in that Squadron.

a. The player controlling the Squadron rolls one die to determine where the planes will be set up. If "1" is rolled, they will be set up near Directional Hexagon "A", if "2" is rolled, they will be set up near Directional Hexagon "B", etc. Roll again if the set up Directional Hexagon has already been used.

b. All Plane units must be placed on or within three hexes of the Directional Hexagon used for the set up. No planes may be placed in the same hex.

c. Plane units face hexsides, the same as explained in the Basic Game Rules. When placed on the mapboard, the Plane units may be faced in any desired direction or directions. HINT: It is usually a good idea to place planes of the same Flight close together.

d. After a Squadron is set up, another Sequence unit is drawn, and another Squadron is set up. This continues until all Squadrons have been set up. Once set up, a Squadron's planes cannot be adjusted in any way while a later Squadron is being set up.

2. INITIAL ALTITUDE DETERMINATION AND RECORDING: After all Squadrons have been placed on the mapboard, the players must determine the Altitude Levels for all Flights which they control. In the Mass Game, Altitude Levels run from "0" to "12".

a. To determine the Initial Altitude Level for each Flight, the controlling player announces the Flight, rolls one die, and places an Altitude unit on any one Plane unit of the Flight.

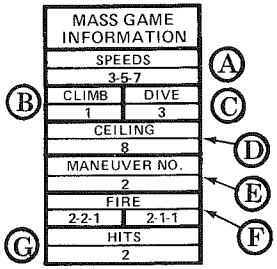
b. The number on the Altitude unit placed should correspond to the number rolled on the die. *For example, if a "3" is rolled, a "3" Altitude unit should be placed.* If the number rolled exceeds the Ceiling Altitude Level of any plane in the Flight, mark the Altitude as high as possible. The one Altitude unit records the Altitude Level of *all* Plane units in that Flight.

c. When all Flights have had their Altitude Levels determined and marked, play of the game is ready to begin.

III. INTERPRETING THE MASS GAME SECTION ON THE DATA CARDS

The Mass Game Information sections on the Data Cards display the information needed to fly and fight the corresponding Plane unit under the Mass Game Rules.

SAMPLE
(DATA CARD 49)



(A) SPEEDS: Three numbers are listed for each plane's Speeds.

1. STALL SPEED: The first number is the plane's Stall Speed. A plane *must* expend *more* Speed Factors per Turn than this number. On the Sample, this number is "3", so this plane must expend a minimum of four Speed Factors every Turn.

2. LEVEL SPEED: The second number is the plane's *Maximum* Level Speed. A plane may not expend more Speed Factors per Turn than this number, unless it is Diving.

3. DIVE SPEED: The third number is the plane's *Maximum* Dive Speed. A plane may expend a number of Speed Factors exceeding the Maximum Level Speed through this number only if it Dives one or more Altitude Levels during the Turn.

(B) CLIMB: The number listed here is the maximum number of Altitude Levels that a plane may Climb during one Turn, called a "Climb Factor".

(C) DIVE: The number listed here is the maximum number of Altitude Levels that a plane may Climb during one Turn, called a "Dive Factor".

(D) CEILING: This is the *highest* Altitude Level that a plane may reach.

(E) MANEUVER NUMBER: This number is the plane's reflects the plane's relative maneuverability compared to other planes. It is used only for Escape Maneuvers.

(F) FIRE: Two groups of three numbers each are listed in this section. The group to the left (if any) is the plane's Hit Table Numbers to its "Front Gunfire Zone". The group to the right (if any) is the plane's Hit Table Numbers to its "Rear Gunfire Zone". In each group, the numbers give the following information:

1. The first number is the plane's Hit Table Number at a Range of one hex.

2. The second number is the plane's Hit Table Number at a Range of two hexes.

3. The third number is the plane's Hit Table Number at a Range of three hexes.

(G) HITS: This number is the total number of hits required to destroy a plane unit of this type.

IV. THE MASS GAME SEQUENCE OF PLAY

The game starts as soon as all set up is complete. The game is played in Turns. Each Turn is divided into Phases, which must be performed in the order listed below. The Turn Sequence is repeated on each Turn until the game ends after ten Turns are completed.

A. THE MIXING PHASE: At the start of each Turn, all of the Sequence units being used should be inverted and mixed thoroughly. This is done only once per Turn, and can be performed by any player.

B. THE SQUADRON PHASES: Any player may draw and expose one of the Sequence units. The player controlling the Squadron with the corresponding letter may then move all Plane units of that Squadron, and any resulting Gunfire is resolved. When one Squadron is finished, another Sequence unit is drawn, etc., until all Squadrons have had the opportunity to move and fire, at which time the Turn ends. Each Squadron's activities are called a "Squadron Phase". Each Squadron Phase consists of two "Steps", which are handled in the following order:

1. THE MOVEMENT STEP: The controlling player moves the Squadron's planes one at a time. Any Passing Gunfire and/or Collisions caused by this movement are resolved as soon as they occur.

2. THE GUNFIRE STEP: All normal Gunfire is resolved.

V. THE MOVEMENT STEP — HOW TO MOVE — RESOLVING PASSING GUNFIRE AND COLLISIONS

Movement represents the action on the mapboard as Plane units "fly" from hex to hex.

A. GENERAL RULES OF MOVEMENT: Plane units are moved one at a time. Move all of the planes of one Flight, then all of the planes of another Flight, etc., until all of the Squadron's planes have been moved. These planes may be moved in any desired order. If players wish, Plane units may be inverted as they are moved to show which still need to be moved. This avoids confusion. Once a Plane unit is moved and inverted, the Plane unit may not be moved again or adjusted during the Turn.

1. During a Squadron Phase, all planes in the Squadron must expend at least enough Speed Factors to exceed the plane's Stall Speeds.

2. Movement from hex-to-hex must always be consecutive. No unused Speed, Climb, or Dive Factors may be transferred to another unit, or accumulated from Turn to Turn.

3. Mapboard sections are not adjusted for Mass Games. Any Plane units that exit the hex grid playing area are out of the game, and may not return, although they are not considered to be destroyed.

4. During a Squadron Phase, only planes of that Squadron may be moved. Other players may observe the moving player's movements to confirm their legality.

5. Planes may pass through hexes occupied by other planes (at risk of a Collision) at the same Altitude Level, but no plane may ever end movement in the same hex as another plane at the same Altitude Level. Any number of planes may occupy the same hex if all are at different Altitudes.

6. All planes in the same Flight are always at the same Altitude Level.

7. Speed Factors are expended by turning, Climbing, or by entering new hexes. During Turns in which a Flight Climbs, or does not change Altitude Levels, the maximum number of Speed Factors available is equal to the planes' Maximum Level Speeds. During Turns in which a Flight Dives one or more Altitude Levels, the maximum number of Speed Factors available is equal to the planes' Maximum Dive Speeds. Planes may expend less Speed Factors than the maximum number available, as long as the plane always expends more Speed Factors than the Maximum Stall Speed.

B. ALTITUDE CHANGES: As a player prepares to start moving the planes of an individual Flight, the decision for an altitude change for the Flight must be made. If an altitude change is made, the Altitude unit for that Flight is removed, and replaced by another Altitude unit that displays the new Altitude Level of the Flight. All planes in the Flight are considered to be at the new Altitude Level for their entire movement.

1. CLIMBS: A Flight may be Climbed any number of Altitude Levels that does not exceed the Climb Factor for any of its planes, or change the Altitude Level to above the Ceiling of any of its planes. One Speed Factor is expended for each Altitude Level Climbed. A Climbing plane must still enter at least one new hex during movement, even if all other Speed Factors are expended by Climbing.

2. DIVES: A Flight may be Dived any number of Altitude Levels that does not exceed the Dive Factor for any of its planes, or change the Altitude Level to

"0", or less. *No* Speed Factors are expended for the Altitude Levels Dived. During any Turn in which a plane Dives one or more Altitude Levels, it has up to the Maximum Dive Speed number of Speed Factors available.

3. No Flight may Dive and Climb during the same Turn.

C. STRAIGHT AHEAD MOVEMENT: A plane expends one Speed Factor for each new hex entered. The Plane unit always moves into the hex it faces.

D. TURNING THE PLANE UNITS: Plane units may be turned to the left or to the right.

1. One Speed Factor is expended for each hexside facing change made by a plane. For normal turns, at least one new hex must be entered during the movement, before the Plane unit can be turned.

2. For normal turns, no more than a one hexside change of facing may be performed in any one hex.

3. During its movement, a Plane unit, once turned, may only be turned in the *same* direction for later turns performed during the remainder of its movement. No plane can be turned to both the right and to the left during the same Turn.

E. ESCAPE MANEUVERS: An "Escape Maneuver" may allow a plane to escape from a potentially dangerous situation by making extra turns during its movement.

1. Any plane that is not in any opposing plane's Active Front Gunfire Zone can automatically perfrom an Escape Maneuver. For a plane that is in an opposing plane's Active Front Gunfire Zone, a comparison of Maneuver Numbers must be made.

a. Compare the Maneuver Number of the plane to be moved with the Maneuver Numbers of *all* opposing planes that have an Active Front Gunfire Zone in the hex.

b. If the Maneuver Number of *any* of the opposing planes is equal to or higher than the Maneuver Number of the plane to be moved, no Escape Maneuver is possible. An Escape Maneuver is possible if the Maneuver Number of the plane to be moved is higher than the Maneuver Numbers of all of the opposing planes.

2. If an Escape Maneuver is possible, the controlling player announces it at the time that the Altitude unit for the Flight is changed. To perform an Escape Maneuver, a plane must Dive at least one Altitude Level, so all planes in the Flight would have to Dive.

3. A plane performing an Escape Maneuver moves normally, but may make any number of turns in a single hex, including the hex in which it started the Turn. Each individual turn still expends one Speed Factor, and all turns during the movement must still be in the same direction.

4. A plane that performs an Escape Maneuver for its movement may *not* fire during its Gunfire Step.

F. POSSIBLE COLLISIONS: A Plane unit that enters a hex containing another Plane unit at the same Altitude Level may cause a Collision.

1. Possible Collisions are resolved as soon as they occur, prior to resolving Passing Gunfire.

2. To resolve a possible Collision, the player moving the plane rolls the two dice, checking the *Collision Table* on the Game Card for the result. If the numbers listed on the Table are rolled, the planes Collide, and both are destroyed.

a. If the Plane unit in the hex is on the same side ("Friend") as the moving Plane unit, a roll of "11" is a Collision.

b. If the Plane unit in the hex is on the opposing side ("Foe") from the moving Plane unit, a roll of "11" or "12" is a Collision.

c. If the hex contains a Cloud unit, and the Altitude Level is in the Cloud, regardless of the sides, rolls of "11" through "16" are Collisions.

G. PASSING GUNFIRE: Whenever a plane moves *through* a hex that is in an Active Gunfire Zone of an opposing plane, at one hex Range, and at the same Altitude Level, the opposing plane may be used for "Passing Gunfire" at the moving plane. This Passing Gunfire is resolved immediately, before the moving plane enters another hex.

1. Procedure for Passing Gunfire is the same as for Normal Gunfire. The controlling player for the firing plane handles the die roll. Hits are marked normally. The player does *not* have to fire.

2. If two planes are in the hex, and at the same Altitude Level, but did not Collide, it is possible that either plane could be hit. If a hit is scored, roll one die again to see which is hit. If an odd number is rolled, the plane originally in the hex is hit. If an even number is rolled, the moving plane is hit.

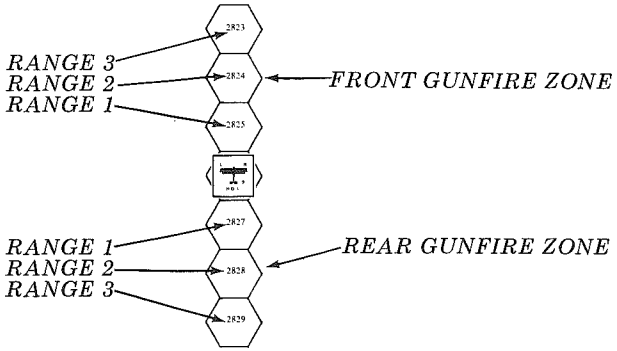
3. The same Plane unit may use Passing Gunfire *every* time an opposing plane moves through a hex where it is possible. Passing Gunfire is *not* used if an opposing plane enters the hex and remains there — this will be resolved by Defensive Gunfire during the Gunfire Step.

VI. THE GUNFIRE STEP — HOW TO RESOLVE NORMAL GUNFIRE

After a player finishes moving all Plane units in a Squadron, the Gunfire Step, if any is possible, is resolved. During a Gunfire Step, *only* Plane units of the Squadron that just completed movement or opposing Plane units that can use Defensive Gunfire against them may fire.

A. GUNFIRE ZONES: Depending on their facing, Plane units have two Gunfire Zones, a Front Fire Zone and a Rear Fire Zone, as shown below:

GUNFIRE ZONES DIAGRAM



A plane may not be used to fire into a Gunfire Zone for which it has no Hit Numbers listed on its Data Card. A Gunfire Zone with Hit Table Numbers listed on its Data Card is an "Active Gunfire Zone" for the plane. Planes may fire only at the *closest* plane in each of its Active Fire Zones. Passing Gunfire may be used only at a Range of one hex. Normal Gunfire (Defensive or Offensive) may be used anywhere in the Active Gunfire Zones.

B. DEFENSIVE AND OFFENSIVE GUNFIRE: Plane units of the Squadron that just completed movement may use "Offensive Gunfire". Opposing Plane units that have the just moved planes in their Active Gunfire Zones may use "Defensive Gunfire" against them. Defensive Gunfire is resolved first, then the Offensive Gunfire.

1. DEFENSIVE GUNFIRE: The resolution of all Defensive Gunfire is made in any desired order, and hits marked immediately. No destroyed Plane units are removed from the mapboard until all Defensive Gunfire has been resolved.

2. OFFENSIVE GUNFIRE: After the resolution of the Defensive Gunfire, all surviving planes of the Squadron that just completed movement may be used to resolve all Offensive Gunfire, in any desired order. No destroyed Plane units are removed from the mapboard until all Offensive Gunfire has been resolved.

C. GUNFIRE DETERMINATION: A Plane unit that is being fired at is called a "target unit".

1. A target unit must be at the same Altitude Level as the firing plane. A plane may use Defensive or Offensive Gunfire once each to its Active Gunfire Zones during one Squadron Phase.

2. BLOCKED FIRING: Gunfire may be "blocked" by a closer plane or Cloud in a Gunfire Zone and at the same Altitude Level.

a. If a friendly plane or Cloud is closer and in the Gunfire Zone, Gunfire may not be used against a more distant target unit.

b. Gunfire may not be used against a more distant target unit, if a closer target unit is available in the same Gunfire Zone.

c. A plane in a hex containing a Cloud unit, and at an Altitude Level included in the Cloud, may not use Gunfire and Gunfire may not be used against it.

D. GUNFIRE PROCEDURE: In any convenient order, the Gunfire is resolved. The controlling player announces a target unit, determines the Hit Table Number, and rolls the die for resolution.

1. DETERMINING THE HIT TABLE NUMBER: The Range to the target unit is counted, and the "Fire" section on the Data Card of the firing plane consulted to find the Hit Table Number for the Gunfire Zone and Range.

2. HIT TABLE NUMBER MODIFIERS: These Modifiers are cumulative in their effect on the Hit Table Number.

a. ONE HEX REAR: If the firing plane is directly behind and at one hex Range from the target unit, and the target unit is in the firing plane's Front Gunfire Zone, a "+1" is added to the Hit Table Number.

b. INTO SUN: A firing plane facing in the *same* direction as the Sun unit's Direction Arrow has a "-1" subtracted from the Hit Table Number.

c. ACE: For the Mass Game, any plane which scores two "kills" is considered to be an "Ace". A "kill" is scored each time that plane's Gunfire causes the *last* hit, which causes the destruction of an opposing plane. Players may keep notes on "kills" on pieces of scratch paper. Whenever an Ace uses Gunfire, a "+1" is added to the Hit Table Number.

3. RESOLVING GUNFIRE: The firing player rolls one die. If the number rolled equals or is less than the Modified Hit Table Number, one hit is scored on the target unit.

4. For ease in reference, the Hit Table Number Modifiers and the numbers to be rolled to score a hit are summarized in the *Gunfire Tables* on the Game Card.

E. MARKING HITS: Use any of the smaller units not being used in the game. Invert a unit and place it on top of a Plane unit for each hit scored. When the number of hits scored on a plane equals or exceeds the number listed for the plane in the "Hits" section on its Data Card, the Plane unit is destroyed and removed from play.

VII. HOW TO WIN THE MASS GAME

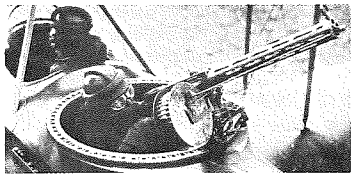
After ten Turns are completed, the game ends. Add up the Combat Point Values of the destroyed Plane units. The side which has lost the fewest total Points is the winner.

VIII. MASS GAME OPTIONAL RULES

These Optional Rules can be used if the players involved in a game wish to add them.

A. FLIGHT LETTER DESIGNATIONS: Set up normally, but limit the number of Flights in the game to no more than the number of Sequence units. After completing set up, reassign a separate Sequence unit and letter designation to each *Flight*. The game is played normally, but each Flight will have its own Squadron Phase when its Sequence unit is drawn. NOTE: The odd number of Sequence units included allows a side with appreciably more planes to have one extra Flight organized.

B. CLOUD ALTITUDES: By mutual agreement during set up, the Altitude Levels of the Cloud units may be varied. It is useful to write these different Altitude Levels for each Cloud unit on a piece of paper for reference during the game.



THE SCENARIOS

I. INTRODUCTION TO THE SCENARIOS

The scenarios in this section provide representative types of air actions fought during World War I, from 1916 to 1918. Each scenario is, in effect, a separate game, and provides the information needed to set up and play the action. Most of these scenarios are *not* intended to represent any specific actions, but are designed to capture the "flavor" of different types of battles, and to provide games that are quite different from one another.

The *WINGS* scenarios are "looser" and more flexible than those found in most other boardgames. This flexible method of setting up scenarios will be familiar to miniature wargamers, but will take some "getting used to" by most board wargamers. After a few games, players should find that it is actually very easy to design their own variants to the game's scenarios, and will appreciate the game's flexibility in this respect. After playing through the game's scenarios, players are encouraged to "try their hand" at designing their own scenarios, as the possibilities are virtually endless.

II. SCENARIO FORMAT

The essential information found in each scenario is presented in the following format:

A. MAPBOARD CONFIGURATION: This tells how the mapboard sections are to be laid together.

B. TERRAIN SET UP: This tells what Terrain and Installation units are to be used, their Altitude Levels, and how they are to be set up.

C. TIME LIMIT: This is the maximum number of Turns that the game can last. If there is no limit, this will say, "None".

D. SPECIAL SCENARIO INFORMATION: Any special rules or suggestions for the scenario are given. Note that in scenarios where the mapboard sections cannot be adjusted, a plane that leaves the mapboard is out of play, and may not be returned to the game. The Battle Location is an Option, explained in VIII.D., below.

E. SUGGESTED FORCES: The total Combat Point Values for both sides are given for the Optional Point Selection of Forces. Suggested units are also listed, or a Chart where they can be found is listed, if the Point Selection of Forces Option is not used.

F. ENTRY/SET UP: This tells where the units enter or can be placed on the mapboard. Units may be placed anywhere on the mapboard, unless it is otherwise stated. NOTE: A plane is considered to be "behind" a particular side of the Set Up Hexagon if it is on or outside of the side, and, if movement in a straight line towards the Set Up Hexagon would cause the plane to cross that particular side first.

G. INITIAL ALTITUDES: The Altitude Levels for units at the start of the game, or the means for determining their Altitude Levels are given. If a Starting Altitude Level is above the Ceiling of any units in the game, they must start at their Ceiling Altitude Levels. Starting Altitude Levels are always given as being that much higher than the Ground Altitude Level.

H. VICTORY CONDITIONS: Normally, the side that accumulates the most Victory Points is the winner, and Victory Points are always awarded for the destruction or damage (Advanced Rules) of enemy units. This is not the case in all scenarios, but exceptions are explained. Victory Points for game objectives are also listed for some scenarios. If a game involves unequal sides (in Combat Point Values), the players may also have to calculate the Victory Point Differential for the game (see VIII.F., below). Resolve the fates of planes that are on Fire, in Uncontrollable Maneuvers, or will Crash Land after a game ends, as this affects the number of Victory Points awarded.

III. SEQUENCE OF SCENARIO SET UP

Once the scenario to be played is selected, and the rules to be used have been determined, the following sequence should be followed in setting up the game.

A. MAPBOARD SET UP: Lay out the mapboard sections to conform to the Mapboard configuration in the scenario.

B. TERRAIN SET UP: Using the Terrain and Install-

ation units specified in the scenario, place them on the mapboard. Except where their locations are mentioned, the Terrain units may be set up anywhere on the mapboard. For easy reference, it may be useful to write down the Altitude Levels of these units on a separate sheet of paper.

C. DETERMINING SIDES:

1. If one player set up the mapboard and Terrain, the other player may select where he will set up or enter the mapboard, or which side he will be, or whether he will be the Attacker of Defender.

2. If both players participated in the mapboard and terrain set up, both players should roll one die. High roll gets the choice of set up location or mapboard entry, or whether to be the Attacker or Defender.

3. Which player will be the Central Power side and which will be the Allied Power side can be decided by mutual agreement, or by both players rolling one die. High roll get the choice. After this is decided, the players may further wish to determine what countries each represents — again, this can be settled by mutual agreement or by competitive die rolls.

D. THE SELECTION OF FORCES: In a normal game, each player should control one to three planes, and possibly some Non-Plane units. Select units from the Suggested Forces in the scenarios.

1. DETERMINING THE PERIOD: The "Notes" section of the Data Cards tells the date when the plane was introduced to combat. Planes introduced after the period in which the scenario is played may not be used in that scenario. Planes introduced during or before the period in which the scenario is played may be used in the scenario. The period of the scenario may be decided by mutual agreement, or by any player rolling the dice, and consulting the *Scenario Period Selection Chart* on the Set Up Card to determine the period to be used. Units other than planes and Zeppelins are considered to be available in any and all time periods. Players may also wish to determine a specific month within the period by any agreeable method.

2. UNIT SELECTION: Unit selection may be done using the Point Selection of Forces method (see VIII.E., below), or by using the units given in the scenario's Suggested Forces section.

a. SUGGESTED PLANE CHARTS: For selection of planes, the scenario may refer the players to the *Suggested Plane Charts* on the Set Up Card. These Charts, while far from exhaustive, do provide some representative types of planes that can be used in a scenario. The planes are listed by their Data Card numbers. Players may use the planes in these Charts, or refer to Data Card Notes for additional planes of the right types and time period.

b. MULTI-PLAYER GAMES: For multi-player games, the number of Combat Point Values or planes per side may be used as the number *per player* on a side, if the number of players on each side is equal, or multiplied by some convenient factor, as long as the ratios remain the same. This permits larger games with no more work per player for resolution.

c. DUEL GAMES: This is the reverse of the multi-player game suggestions. Unless the number of units is already very small, the number of Combat Point Values or planes or other units per side should be reduced, keeping the ratios the same. Alternately, the same number of units could be kept, but the number of players could be increased.

3. Prepare the Command Sheets for all units to be used in the game.

E. NON-PLANE UNIT SET UP: In scenarios containing them, the units on the surface, and Balloon and Zeppelin units are placed on the mapboard, as directed in the scenario. They may be placed facing in any desired or allowable directions. They are placed before the planes.

F. PLANE UNIT SET UP: The individual scenarios contain information as to where planes are placed and their Initial Altitudes.

1. The Initials for Turn One should be filled in for each plane. The Initial Speed may be any number of Speed Factors that falls in the plane's Level Speed Increment. The Initial Altitude may be any Altitude Level allowed by the scenario. The Initial Bank may be any Bank Attitude the player wishes to use.

2. Write the Initial Hex number and the Initial Direction faced for all planes. Then, unless the scenario says otherwise, all planes are simultaneously placed on the mapboard. The game is now ready to begin.

IV. SCENARIO ONE: "Gasbags"

These scenarios are primarily designed to be played solitaire, although 1E is not suitable for solitaire.

A. SCENARIO 1A: "Basic Game Zeppelin Solitaire"
This scenario is useful for players new to *WINGS* for practicing the mechanics of the game — proper notations, movement execution, and firing procedures. Only the Basic Game Rules and the rules found here are necessary to play this scenario.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in the Standard Edge-to-Edge alignment.

2. TERRAIN SET UP: No terrain is used.

3. TIME LIMIT: 10 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may be adjusted as needed. Planes are not Loaded, and Incendiary Ammunition may not be used. In this scenario, the player is pitted against an unarmed Zeppelin that is moved randomly according to dice rolls. The following special rules apply for use of the Zeppelin unit.

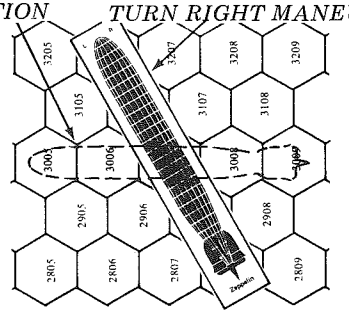
a. The player plots the orders for his plane normally. After plotting, the dice are rolled to determine the Zeppelin unit's orders, which are then executed. Make a record of the Zeppelin's new Initial Altitude. Then execute the orders for the plane.

b. The orders for the Zeppelin are determined by rolling the two dice twice, and consulting the following Table:

DICE ROLL	MOVE	ALTITUDE CHANGE
11-13	---TL	Climb 3
14-16	--TL	Climb 3
21-23	---TR	Climb 2
24-26	--TR	Climb 1
31-33	0	0
34-36	1	0
41-46	11	Dive 1
51-56	111	Dive 2
61-66	1111	Dive 3

(1) The first roll is crossgridded with the "Move" column to determine the Zeppelin's movement orders. *For example, if a "22" is rolled, the Zeppelin unit has orders for four Impulses, "–", "–", "–", and "TL".*
(2) The second roll is crossgridded with the "Altitude Change" column to determine the Zeppelin's orders to Climb or Dive.
(3) The Zeppelin unit is turned by pivoting the unit on its center hex, as shown below:

INITIAL FACING AND POSITION *FACING AND POSITION AFTER TURN RIGHT MANEUVER*



c. The Zeppelin unit can be destroyed only if two "L" and/or "F" hits are scored. All other hits are treated as "misses".

5. SUGGESTED FORCES: The unarmed Zeppelin unit provides the opposition. The player may use one plane, either a Nieuport 11 (Data Card 6) or an Airco D.H.2 (Data Card 27).

6. ENTRY/SET UP: The Zeppelin unit is set up with any two of its hexes in the Center hexes of the center mapboard section. The plane can be placed anywhere outside of the Set Up hexagon.

7. INITIAL ALTITUDES: The Zeppelin unit starts at an Altitude Level of "400". The plane starts at any Altitude Level up to "410".

8. VICTORY CONDITIONS: The player wins if the Zeppelin unit is destroyed, and the plane survives.

B. SCENARIO 1B: "Zeppelin Attack"
Although giant rigid airships were used by many nations, the often heavily-armed German Zeppelins were the only ones to see appreciable service in World War I. They were used throughout the war for long-range scouting missions, and for bombing strategic targets (especially in Great Britain), although their vulnerability grew as airplanes improved. This scenario is intended for use by players using at least some Optional Rules (especially Option VI.D.). It can be played Solitaire, or with another player controlling the Zeppelin.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in the Standard Edge-to-Edge alignment.

2. TERRAIN SET UP: No terrain is necessary, although any, especially Cloud units, could be placed, if desired (see VIII.A., below).

3. TIME LIMIT: None.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may be adjusted as needed. Planes are not Loaded, unless they can carry Rockets, and Incendiary Ammunition may be used. Normally, these actions were fought at night (use Visibility Conditions of "-2" or "-3"). The Battle Location is "A". The player may decide if the Zeppelin is empty or Loaded, as this determines the possible Ceiling.

5. SUGGESTED FORCES: Select a Zeppelin from those listed on the *Individual Zeppelin Information Chart* on the Set Up Card. Then select an equal number of Combat Points in Allied planes of any type or types (or, choose 2-3 planes from the *Suggested Plane Charts*). The planes selected should be from about the same time period as the Zeppelin model used, or older.

6. ENTRY/SET UP: The Zeppelin unit is set up with any two of its hexes in the Center hexes of the center mapboard section. The planes may be set up in any hexes along the sides of the mapboard. After the Initial Hex, Initial Direction, etc., are written for each plane, their controlling player rolls one die for each. The number rolled on the die for each plane is the Turn when that plane can be placed in its Initial Hex to begin moving on the mapboard.

7. INITIAL ALTITUDES: Any player rolls one die. The number rolled, multiplied by "150" is the Altitude Level of the Zeppelin. Planes may be started at any Altitude Levels that do not exceed the Zeppelin's Altitude Level by more than "25".

8. VICTORY CONDITIONS: The plane side wins if the Zeppelin unit is destroyed, and at least one plane unit is not destroyed. The Zeppelin side wins if the Zeppelin is not destroyed. The game is a draw if all units on both sides are destroyed, or if the Zeppelin is destroyed as a result of a Collision with an enemy plane.

C. SCENARIO 1C: "Balloon Attack"
Attacks on Balloons were quite common, though quite dangerous for all concerned. This scenario is intended only for Solitaire play, and requires the use of at least some Optional Rules.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in the Standard Edge-to-Edge alignment.

2. TERRAIN SET UP: Use all Ground Terrain units. Woods units are 4 Altitude Levels high, and Hill units are 10 Altitude Levels high.

3. TIME LIMIT: 10 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. The planes are not Loaded, unless they can carry Rockets, and Incendiary Ammunition may be used. The Battle Location is "B".

5. SUGGESTED FORCES: The Balloon is protected by Guns totalling 40 Combat Points, or by three Machinegun Gun units with five Belt Machineguns spread in any manner between them and one Automatic Cannon Gun unit with one Automatic Cannon. The player takes a plane or planes worth up to 40 Combat Points, or one plane of any type, which may be selected from any of the *Suggested Plane Charts*. One Belt Machinegun may be replaced by a Machinegun in the Balloon. The player is the "Attacker", and the Balloon side is the "Defender".

6. ENTRY/SET UP: The Balloon unit is placed to occupy both of the Center hexes of the center mapboard section. The Gun units may be set up anywhere inside of the Set Up Hexagon. The plane or planes may be set up in any hexes along the sides of the mapboard.

7. INITIAL ALTITUDES: The Initial Altitude Level of the Balloon is determined by rolling the two dice and crossgridding the number rolled with the "In.Alt." column in the "Balloon" section of the *Solitaire Movement Tables* on the Game Card. After this is determined, the planes may be started at any desired Altitude Level or Levels.

8. VICTORY CONDITIONS: The Attacker wins if the Balloon unit is destroyed, *and* a normal victory on Victory Points is won. The Defender wins if this is not done.

D. VARIANTS ON SCENARIO ONE: For Scenario 1B and Scenario 1C, the number of Combat Points or planes for the player can be doubled. An opposing player can then take an equal number of extra Combat Points in fighter planes, or an equal number of fighter planes (these may be chosen from the "Fighter" section of the *Suggested Plane Chart*) to escort the Zeppelin or Balloon. These escorts may be set up at any Altitude Level or Levels inside the Set Up Hexagon. A player now controls all units on each side, but otherwise the games are played the same as the Solitaire versions.

E. SCENARIO 1E: "The Balloon Buster"
This scenario is based on the historical last mission (September 29, 1918) of the American Ace, Frank Luke, popularly known as the "Balloon Buster" for the large number of Balloons he destroyed. The scenario is intended for play by two players, requires the use of some Optional Rules, and makes a good Duel Game.

FRANK LUKE

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in an End-to-End alignment.

2. TERRAIN SET UP: Use all Ground Terrain units. Woods units are 4 Altitude Levels high, and Hill units are 15 Altitude Levels high.

3. TIME LIMIT: 20 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. The Attacker may use Incendiary Ammunition. The Battle Location is "B". The Attacker's Home Territory Direction is the opposite of the Spad's Initial Direction.

5. SUGGESTED FORCES: The "Attacker" gets Frank Luke, in a Spad 13 (Data Card 23 — use Gun Position "A"). Luke is "I" Rating Quality, has "-1" Luck, "+1" Eyesight, "+1" Accuracy, and 18 "kills". The "Defender" gets 3 Balloons, 3 Fokker D. VII (Data Card 86), 4 Machinegun Gun units with 7 Belt Machineguns spread in any manner between them, and 2 Automatic Cannon Gun units with one Automatic Cannon each, all of "E" Rating Quality.

6. ENTRY/SET UP: Place one Balloon unit to occupy both of the Center hexes of each of the mapboard sections. The Gun units may be placed anywhere on the mapboard at least five hexes from any mapboard sides. All planes may be set up in any hexes along the sides of the mapboard. The Attacker enters immediately. The Defending planes require a die roll by the controlling player for each. *Double* the number rolled on the die for each plane is the Turn when that plane can be placed in its Initial Hex to begin moving on the mapboard.

7. INITIAL ALTITUDES: The Initial Altitude Level for each Balloon is separately determined by rolling the two dice and crossgridding the number rolled with the

"In.Alt." column in the "Balloon" section of the *Solitaire Movement Tables* on the Game Card. After this is determined, the planes may be started at any desired Altitude Levels.

8. VICTORY CONDITIONS: The Attacker wins if two or more of the Balloon units are destroyed, and Frank Luke survives. The Defender wins if this is not done. Historically, in this desperate action, Luke got all three Balloons, and, according to some reports, also shot down two planes. However, the Spad went down, and Luke was killed on the ground by German soldiers. He was awarded the Medal of Honor for this action.

V. SCENARIO TWO: "Dogfights"

These scenarios represent situations where only fighters are involved. They are suitable for play using only the Basic Game Rules. For the first few Basic Games, it is suggested that player control no more than two planes each.

A. SCENARIO 2A: "Meeting Engagement"
This represents a situation where fighters "bump" head-on into each other in an unexpected confrontation.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in the Standard Edge-to-Edge alignment.

2. TERRAIN SET UP: No terrain is necessary, although any could be placed, if desired.

3. TIME LIMIT: 20 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may be adjusted as needed. No planes are Loaded. The Battle Location is "C".

5. SUGGESTED FORCES: The suggested Combat Points can vary from about 35 Combat Points per player (for a Duel Game) up to around 100 Combat Points per player, or 1-3 planes per player. The number of Combat Points or planes per side should be equal. All planes should be fighters, and may be selected from the "Fighter" section of the *Suggested Plane Charts.*

6. ENTRY/SET UP: The planes for each side should be set up behind opposite sides of the Set Up Hexagon. *For example, if one side set up behind side "I", the other side would set up behind side "IV", etc.* The sides to be used may be determined by mutual agreement, or by competitive die rolls.

7. INITIAL ALTITUDES: Any player rolls one die. The number rolled is multiplied by "100" to determine a Reference Altitude Level. All planes must be started at an Altitude Level within "10" Altitude Levels of the Reference Altitude Level.

8. VICTORY CONDITIONS: Victory is determined by the side with the most Victory Points. This scenario works only if all players are aggressive, and do not play cautiously, otherwise little will happen.

B. SCENARIO 2B: "Surprise Encounter"
This represents a situation where the fighters do not see each other until the last moment. This scenario is exactly the same as Scenario 2A, except for the Entry/Set Up. Instead of setting up behind opposite sides of the Set Up Hexagon, the players each secretly roll one die to determine the side to be set up behind ("1" = "I", "2" = "II", etc.). Nobody knows the situation until the planes are simultaneously placed on the mapboard.

C. SCENARIO 2C: "Bounce"
This represents a situation where one side attempts to attack the other side from a favorable direction. This scenario is exactly the same as Scenario 2A, except for the Entry/Set Up. One side must set up all planes on or within two hexes of the Center hexes of the center mapboard section. The other side, *after* seeing the placement of the opponent's planes, may be set up outside of and behind any one side of the Set Up Hexagon.

D. SCENARIO 2D: "Hawker vs. Richthofen"
This scenario is based on the historical battle fought on November 23, 1916 between two top aces, Great Britain's Lanoe Hawker, and Germany's Manfred von Richthofen (later known as the "Red Baron"). This scenario requires the use of some Optional Rules, and makes an excellent Duel Game.

HAWKER

VON RICHTHOFEN

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in the Standard Edge-to-Edge alignment.

2. TERRAIN SET UP: No terrain is necessary, although any could be placed, if desired.

3. TIME LIMIT: 20 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may be adjusted as needed. No planes are Loaded. The Battle Location is 3 Distance Numbers inside German territory, and the British Home Territory Direction is "1".

5. SUGGESTED FORCES:

a. BRITISH: Airco D.H.2 (Data Card 27 — use Gun Position "A"). Hawker is "I" Rating Quality, has "+1" Eyesight, "+2" Accuracy, and 15 "kills".

b. GERMAN: Albatros D. II (Data Card 68). Von Richthofen is "I" Rating Quality, has "+1" Eyesight, "+2" Accuracy, and 10 "kills".

6. ENTRY/SET UP: Place the D.H.2 in one of the Center hexes of the center mapboard section. *After* this, the Albatros D.II may be set up anywhere outside of the Set Up Hexagon.

7. INITIAL ALTITUDES: The D.H.2 is at 375 Altitude Levels. The Albatros D.II is at 400 Altitude Levels.

8. VICTORY CONDITIONS: Victory is determined by the side with the most Victory Points. This is a game between unequal sides, and the Victory Point Differential Number for the British is "8". Historically, after a long battle, Hawker was shot down and killed.

VI. SCENARIO THREE: "Missions"

These scenarios represent situations where fighters attack larger planes that are engaged in specific missions. These scenarios require the use of at least the Advanced Game Rules.

A. SCENARIO 3A: "Observation Mission"
This represents a situation where a large plane or planes must observe enemy territory in order to "spot" for friendly artillery.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in the Standard Edge-to-Edge alignment.

2. TERRAIN SET UP: No terrain is necessary, although any could be placed, if desired.

3. TIME LIMIT: 20 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. No planes are Loaded. The Battle Location is "D".

5. SUGGESTED FORCES: The suggested Combat Points per player is about 70, or 2-3 planes per player. The number of Combat Points or planes per side should be equal. One side must be the "Attacker", and takes the observation planes (these may be selected from the "Observation and Reconnaissance" section of the *Suggested Plane Charts*), while the other side is the "Defender", and takes the fighter planes (these may be selected from the "Fighter" section of the *Suggested Plane Charts).* If the Point Selection of Forces is being used, the Defender must use some Combat Points to "purchase" at least one "Archie" Gun.

6. ENTRY/SET UP: The Attacker's planes are set up on or within five hexes of the Center hex of the center mapboard section. The Defender's planes may be set up anywhere outside of the Set Up Hexagon. The Heavy Gun unit, if used, may be placed anywhere on the mapboard.

7. INITIAL ALTITUDES: Any player rolls one die. The number rolled is multiplied by "100" to determine a Reference Altitude. Roll again if a "1", "5", or "6" is rolled, as the Reference Altitude must be "200", "300", or "400". The Attacker's planes must be started at an Altitude Level within "10" Altitude Levels of the Reference Altitude Level, and the Defender's planes must be started within "25" Altitude Levels of the Reference Altitude Level.

8. VICTORY CONDITIONS: In addition to the normal Victory Points for destroying and damaging enemy planes, game objective Victory Points can be gained. The Attacking side gets two Victory Points for each Turn at least one Attacking plane is within 50 Altitude Levels of the Reference Altitude Level and is within a five Hex Range of one of the Center hexes of the center mapboard section. Such a plane may not have its Engines destroyed, be on Fire, or be in a Spin or an Uncontrollable Maneuver. The Defending side gets four Victory Points for each Turn in which the Attacker does not get Victory Points in this manner.

B. SCENARIO 3B: "Photography Mission"
This represents a situation where a large plane or planes must "Photograph" specific hexes. This scenario requires the use of at least some Optional Rules.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in the Standard Edge-to-Edge alignment.

2. TERRAIN SET UP: The four Landing Field units are placed anywhere in mapboard section "CD". No other terrain is necessary, although any could be placed, if desired.

3. TIME LIMIT: 15 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. All of the Attacker's planes are Loaded with Cameras. The Defender's planes are not Loaded. The Battle Location is "D".

5. SUGGESTED FORCES: The suggested Combat Points per player is about 70, or 2-3 planes per player, with an equal number of Combat Points or planes on both sides. One side must be the "Attacker", and takes the observation planes (these may be selected from the "Observation and Reconnaissance" section of the *Suggested Plane Charts*), while the other side is the "Defender", and takes the fighter planes (these may be selected from the "Fighter" section of the *Suggested Plane Charts*). If the Point Selection of Forces is being used, the Defender must use some Combat Points to "purchase" at least one "Archie" Gun.

6. ENTRY/SET UP: The Attacker's planes are set up on or within three hexes of the Center hexes of the center mapboard section. The Defender's planes may be set up anywhere outside of the Set Up Hexagon. The Heavy Gun unit, if used, may be placed anywhere on the mapboard.

7. INITIAL ALTITUDES: Any player rolls one die. The number rolled is multiplied by "100" to determine a Reference Altitude. All planes must be started at an Altitude Level within "10" Altitude Levels of the Reference Altitude Level.

8. VICTORY CONDITIONS: In addition to the normal Victory Points for destroying and damaging enemy planes, game objective Victory Points can be gained. The Attacking side gets 2 Victory Points for each Landing Field hex successfully Photographed while within 25 Altitude Levels of the Reference Altitude Level. It will be helpful to make notes of what hexes each plane Photographs for calculating the Victory Points. The Defending side gets a bonus of 5 Victory Points for each Camera Loaded plane destroyed or forced to Jettison its Camera.

C. SCENARIO 3C: "Bombing Mission"
This represents a situation where a large plane or planes loaded with bombs fly through defended airspace on their way to a target.

1. MAPBOARD CONFIGURATION: Any *two* mapboard sections should be placed in an End-to-End alignment.

2. TERRAIN SET UP: No terrain is necessary, although any could be placed, if desired.

3. TIME LIMIT: 20 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. All of the Attacker's planes are Loaded with Bombs. The Defender's planes are not Loaded. The Battle Location is "E".

5. SUGGESTED FORCES: The suggested Combat Points per player is about 100, or about three planes per player, with an equal number of Combat Points or planes on both sides. One side must be the "Attacker", and take the bombers (these may be selected from the "Bomber" section of the *Suggested Plane Charts*), while the other side is the "Defender", and takes the fighters (these may be selected from the "Fighter" section of the *Suggested Plane Charts*).

6. ENTRY/SET UP: The Attacking planes may be set up in any hexes along the side of one outside end (known to the Defender) of one of the mapboard sections. The Defending planes may be set up anywhere on the mapboard at least twenty hexes from the end where the Attackers enter the mapboard.

7. INITIAL ALTITUDES: Any player rolls one die. The number rolled is multiplied by "80" to determine a Reference Altitude. All planes must be started at an Altitude Level within "20" Altitude Levels of the Reference Altitude Level.

8. VICTORY CONDITIONS: The Attacking player gets a number of Victory Points equal to one-fourth of the Combat Point Value (round all fractions up) of each Attacking plane that exits the mapboard at the opposite end. When the plane exits, it must be within "25" Altitude Levels of the Reference Altitude Level, not on Fire, and still carrying its Bomb Load to be worth these Victory Points. The Defender gets ten Victory Points for each surviving attacking plane that has not exited the mapboard at the opposite end by the completion of the game. The normal Victory Points for destroying and damaging enemy planes are also awarded.

D. VARIANTS ON SCENARIO THREE: Double the Combat Point Values or numbers of planes for both sides in Scenarios 3A, 3B, or 3C. The Attacking side gets these extras in the form of escorting fighters, and the Defender simply increases the number of fighters (for both sides, these new planes may be selected from the "Fighter" section of the *Suggested Plane Charts*). With these extra forces, all of these scenarios make good multi-player games.

VII. SCENARIO FOUR: "Low Level"

These scenarios represent situations where planes fly low to the ground. These scenarios require the use of at least some of the Optional Rules.

A. SCENARIO 4A: "Tactical Attack"
This represents a situation where fighters or ground attack planes are used against tactical targets immediately behind the front lines. This scenario may be played Solitaire or with an opponent.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in an Edge-to-Edge alignment.

2. TERRAIN SET UP: Use all Ground Terrain and Railline units, although other units could be placed, if desired. Woods units are 4 Altitude Levels high. Hill units are 10 Altitude Levels high. The Railline units should be joined together into one long Railline that runs off any two sides of the mapboard.

3. TIME LIMIT: 15 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. All Attacking planes may be Loaded with Bombs and/or Grenades. The Battle Location is "B".

5. SUGGESTED FORCES:

a. SOLITAIRE VERSION: The player (called the "Attacker") takes up to 100 Combat Points, or 2-3 planes (these may be selected from the "Fighter" or "Ground Attack" sections of the *Suggested Plane Charts*). The opposition (called the "Defender") gets up to 100 Combat Points in Non-Plane units, or 3 Infantry units, 4 Machinegun Gun units with 9 Belt and 3 Magazine Machineguns spread in any manner between them, and 2 Automatic Cannon Gun units with 3 Automatic Cannons spread in any manner between them.

b. TWO PLAYER VERSION: The Attacker takes up to 100 Combat Points, or 2-3 planes, the same as in the

Solitaire version. The Defender gets up to 40 Combat Points in planes, or one plane (this may be selected from the "Fighter" section of the *Suggested Plane Charts*), and up to 60 Combat Points in Non-Plane units, or 3 Infantry units, 3 Machinegun Gun units with 5 Belt and 3 Magazine Machineguns spread in any manner between them, and one Automatic Cannon unit with one Automatic Cannon.

6. ENTRY/SET UP: The Defender also has all Vehicle units and the Heavy Gun unit, which represents two Field Guns. All Defending units may be set up anywhere on the mapboard over five hexes from the mapboard sides. All Attacking units may be set up in any hexes along the sides of the mapboard.

7. INITIAL ALTITUDES: All planes may be started at any Altitude Level of "50", or less.

8. VICTORY CONDITIONS: The normal Victory Points are awarded for destroying and/or damaging enemy units. In addition, the Attacker gets 5 Victory Points for each Railline hex destroyed, and, at the conclusion of the game, the Defender gets 1 Victory Point for each Railline hex that has not been destroyed.

B. SCENARIO 4B: "Smoke Screen"
This represents a situation where bombers or ground attack planes are used to lay a Smoke Screen on a ground battlefield. This scenario may be played Solitaire or with an opponent.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in an Edge-to-Edge alignment.

2. TERRAIN SET UP: Use all Ground Terrain and Trench units, although other units could be placed, if desired. Woods units are 2 Altitude Levels high, and Hill units are 15 Altitude Levels high. The Trench units must be set up on or within four hexes of the Center hexes of the center mapboard section.

3. TIME LIMIT: 10 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. All Attacking planes may be Loaded with Smoke Candles, or Smoke Bombs and Grenades. The Battle Location is "F".

5. SUGGESTED FORCES:

a. SOLITAIRE VERSION: The player (called the "Attacker") takes up to 70 Combat Points, or 2-3 planes (these may be selected from the "Bomber" or "Ground Attack" sections of the *Suggested Plane Charts*). The opposition (called the "Defender") gets up to 70 Combat Points in Non-Plane units, or 3 Infantry units, and 4 Machinegun Gun units with 7 Belt and 5 Magazine Machineguns spread in any manner between them.

b. TWO PLAYER VERSION: The Attacker is the same as in the Solitaire version. The Defender gets up to 35 Combat Points in planes, or one plane (this may be selected from the "Fighter" section of the *Suggested Plane Charts*), and up to 35 Combat Points in Non-Plane units, or 3 Infantry units, and 3 Machinegun Gun units with 4 Magazine and 1 Belt Machinegun spread in any manner between them.

6. ENTRY/SET UP: All Defending units may be set up anywhere on the mapboard over five hexes from the mapboard sides. All Attacking units may be set up in any hexes along the sides of the mapboard.

7. INITIAL ALTITUDES: All planes may be started at any Altitude Level of "50", or less.

8. VICTORY CONDITIONS: The normal Victory Points are awarded for destroying and/or damaging enemy units. In addition, the Attacking side gets 4 Victory Points for each Trench unit hex in which a Smoke Screen is laid by the end of the game. The Defending side gets 4 Victory Points for each Trench unit hex without a Smoke Screen at the end of the game.

C. SCENARIO 4C: "Strafing Attack"
This represents a situation where planes are used for attacks on front line targets. This scenario is exactly the same as Scenario 4B, except that the Attacking planes may include fighter types, and the Attacking planes are Loaded with Bombs and/or Grenades instead of Smoke Candles and Smoke Bombs. Only the normal Victory Points are awarded.

D. SCENARIO 4D: "Dawn Patrol"
This represents a situation where fighters, bombers, and/or ground attack planes are used in a surprise dawn attack on an enemy aerodrome complex.

1. MAPBOARD FIGURATION: The three mapboard sections should be placed in an Edge-to-Edge alignment.

2. TERRAIN SET UP: Use all Ground Terrain and Installation units, except for Railline units, although other units could be placed, if desired. Woods units are 4 Altitude Levels high, Hill units are 10 Altitude Levels high, and the Hanger and Building units are 2 Altitude Levels high. These units may be placed anywhere on the mapboard, except that the Landing Field units must be placed with at least one hex within five hexes of the Center hexes of the center mapboard section, and all Hanger and Building units must be placed adjacent to a Landing Field unit.

3. TIME LIMIT: 20 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. All Attacking planes may be Loaded with Bombs and/or Grenades. All Defending planes start on the ground. The Battle Location is "G".

5. SUGGESTED FORCES: One side must be the "Attacker", and takes up to 100 Combat Points, or 2-3 planes (these may be selected from the "Fighter", "Bomber", or "Ground Attack" sections of the *Suggested Plane Charts*). The other side is the "Defender", and takes up to 80 Combat Points in planes, or 2-3 planes (these may be selected from any section of the *Suggested Plane Charts*), and up to 60 Combat Points in Non-Plane units, or one Infantry unit, 4 Machinegun Gun units with 6 Magazine and 3 Belt Machineguns spread in any manner between them, and one Automatic Cannon unit with one Automatic Cannon.

6. ENTRY/SET UP: The Defender also has all Truck and Wagon units, which must be set up adjacent to Landing Field units. All other Defending unit may be set up anywhere on the mapboard over five hexes from the mapboard sides. Note that Gun and/or Infnatry units may be set up in Trench hexes. All Defending planes must be placed in Landing Field hexes, and plane readiness determined for each by a dice roll crossgridded with the "Initial Readiness" column of the *Take Off Tables* on the Game Card. The Attacking planes are set up *after* all Defending units have been set up, and may be set up in any hexes along the sides of the mapboard.

7. INITIAL ALTITUDES: The Attacking planes may be started at any Altitude Level of "50", or less.

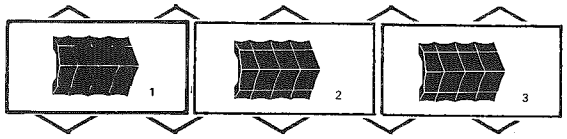
8. VICTORY CONDITIONS: The normal Victory Points for destroyed and/or damaged enemy units apply. The Defending side gets a bonus of 50 Victory Points if none of its planes have been destroyed by the end of the game.

E. SCENARIO 4E: "Zeppelin Sheds"
When Zeppelins were not in the air, they were stored on the ground in huge hangers, called "sheds". This scenario represents a situation where planes are used to attack a shed that contains a Zeppelin. This scenario may be played Solitaire or with an opponent.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in an Edge-to-Edge alignment.

2. TERRAIN SET UP: Use all Ground Terrain and Hanger units, although other units could be placed, if desired. Woods units are 3 Altitude Levels high, and Hill units are 10 Altitude Levels high. The Terrain units may be placed anywhere, but the Hanger units (which are 5 Altitude Levels high) must be placed together, as shown below, with at least one of the Hanger units in a Center hex of the center mapboard section.

THIS REPRESENTS A ZEPPELIN SHED



3. TIME LIMIT: 10 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. All Attacking planes may be Loaded with Bombs, but no Grenades. In this sce-

nario, the Zeppelin is only a target on the ground, it has no Crewmen or Guns aboard, and is considered to be inside the Zeppelin Shed. The Zeppelin is destroyed if a total of two "F" and/or "L" hits are scored, or if all three Hanger units are destroyed. The Battle Location is "H".

5. SUGGESTED FORCES:

a. SOLITAIRE VERSION: Select a Zeppelin from those listed on the *Individual Zeppelin Information Chart*. The Zeppelin chosen will determine the size of the scenario. The player (called the "Attacker") takes Allied planes to match the Combat Point Value of the *Zeppelin*, or 2-3 planes (these may be selected from the "Observation and Reconnaissance", "Bomber", or "Shipping Attack sections of the *Suggested Plane Charts*). The opposition (Called the "Defender") gets an equal number of Combat Points in Non-Plane units, or 1 Infantry unit, 4 Machinegun Gun units with 8 Belt Machineguns spread in any manner between them, 2 Automatic Cannon Gun units with 3 Automatic Cannon spread in any manner between them, and one Gun unit with one "Archie" Gun.

b. TWO PLAYER VERSION: The Attacker is the same as in the Solitaire version. The Defender gets up to one-half the Combat Point Value in planes, or one plane (this may be selected from the "Fighter" or "Shipping Attack" sections of the *Suggested Plane Charts*), and up to one-half the Combat Point Value in Non-Plane units, or 3 Machinegun Gun units with 4 Belt Machineguns spread in any manner between them.

6. ENTRY/SET UP: All Defending units may be set up anywhere on the mapboard over five hexes from the mapboard sides. All Attacking units may be set up in any hexes along the sides of the mapboard.

7. INITIAL ALTITUDES: All planes may be started at any Altitude Level of "300", or less.

8. VICTORY CONDITIONS: The normal Victory Points for destroyed and/or damaged units apply, except that the Zeppelin unit is worth only one-fourth (round all fractions up) of its normal Victory Point Value, since it is on the ground.

F. SCENARIO 4F: "Shipping Attack"
This represents a situation where planes are used to attack enemy ships. This scenario may be played Solitaire or with an opponent.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in an Edge-to-Edge alignment.

2. TERRAIN SET UP: No terrain is necessary, although any could be placed, if desired (i.e. Woods and Hill units could represent islands).

3. TIME LIMIT: 15 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may be adjusted as needed. All Attacking planes may be Loaded with Bombs or a Torpedo (if possible), but no Grenades. The mapboard is considered to be entirely "water". The Battle Location is "I".

5. SUGGESTED FORCES:

a. SOLITAIRE VERSION: Select a Ship unit from those listed on the *Ship Information Chart* on the Set Up Card. Then, for the player, select up to an equal number of Combat Points in planes, or 1-2 planes (these may be selected from the "Shipping Attack" section of the *Suggested Plane Charts* — take one plane if the Ship unit is a Submarine or Small Escort, and two planes if the Ship unit is an Escort or Large Escort). The player is called the "Attacker", and the opposition is called the "Defender".

b. TWO PLAYER VERSION: Keep the forces as in the Solitaire version for both sides, but add up to an additional 35 Combat Points in planes, or one plane (these may be selected from the "Shipping Attack" section of the *Suggested Plane Charts*) to both sides.

6. ENTRY/SET UP: All Defending units may be set up anywhere on the mapboard on or within 5 hexes of the Center hexes of the center mapboard section. All Attacking planes may be set up in any hexes along the sides of the mapboard.

7. INITIAL ALTITUDES: All planes may be started at any Altitude Level of "50", or less.

8. VICTORY CONDITIONS: The Attacker wins if the Ship unit is destroyed ("sunk"). The game is a draw if the Attacker gains more Victory Points than the Defender, but the Ship unit is not destroyed. Otherwise, the Defender wins.

G. SCENARIO 4G: "Harbor Attack"
This represents a situation where planes are used to attack a heavily defended enemy harbor. This scenario should be played with more than one player per side.

1. MAPBOARD CONFIGURATION: The three mapboard sections should be placed in an Edge-to-Edge alignment.

2. TERRAIN SET UP: The players may select any two of the mapboard sections to be "land", and the other mapboard section to be "water". Use all Ground Terrain, Hanger (representing large buildings), and Building units, although other units could also be placed, if desired. Woods units are 4 Altitude Levels high, Hill units are 20 Altitude Levels high, and Hanger and Building units are 2 Altitude Levels high. The units may be placed anywhere, although Woods and Hill units placed in water hexes would be considered to be "islands", and Hanger or Building units would have to be placed on these islands if placed in the water mapboard section. Hexes that are half land, half water are considered to be land hexes.

3. TIME LIMIT: 20 Turns.

4. SPECIAL SCENARIO INFORMATION: Mapboard sections may not be adjusted. All Attacking planes may be Loaded with Bombs or a Torpedo (if possible), and/or Grenades. The Battle Location is "H".

5. SUGGESTED FORCES: One side must be the "Attacker", and takes up to 200 Combat Points, or 4-6 planes (these may be selected from the "Bomber" or "Shipping Attack" sections of the *Suggested Plane Charts*). The other side is the "Defender", and takes up to 90 Combat Points in planes, or 2-3 planes (these may be selected from the "Fighter" or "Shipping Attack" sections of the *Suggested Plane Charts*), up to 45 Combat Points in Ship units, or two Ship units (use Submarines and/or Small Escorts), and up to 65 Combat Points in Non-Plane units, or 2 Infantry units, 4 Machinegun Gun units with 6 Belt Machineguns spread in any manner between them, one Heavy Gun unit with one "Archie" Gun, and 2 Automatic Cannon Gun units each with one Automatic Cannon.

6. ENTRY/SET UP: Defending Ship units must be placed in water hexes on or within two hexes of the Center hexes of that mapboard section. Infantry and Gun units may be set up in any land or island hexes. The Defending plane units may be set up anywhere on the mapboard over five hexes from the mapboard sides. All Attacking planes may be set up in any hexes along the sides of the mapboard. After all units are placed, roll one die for each Ship unit. If a "1" or "2" is rolled, the Ship is "anchored", and cannot be moved during the game.

7. INITIAL ALTITUDES: All planes may be started at any Altitude Level of "200", or less.

8. VICTORY CONDITIONS: The Attacker wins if at least one Ship unit is destroyed ("sunk"). The game is a draw if the Attacker gains more Victory Points than the Defender, but a Ship unit is not destroyed. Otherwise, the Defender wins.

VIII. VARYING THE GIVEN SCENARIOS — DESIGNING YOUR OWN SCENARIOS

The scenarios given in the rules, flexible as they are, barely scratch the surface as far as games that can be set up. Variants on the given scenarios can be designed, or totally new scenarios can be tried. Ideas for scenarios can be gleaned from books, movies, TV shows, magazines, etc., or by just using your imagination. These scenarios are just an idea of what can be done with the rules, and should give imaginative players plenty of ideas for devising their own scenarios.

There are two very important items to keep in mind when doing your scenarios. The first is that the number of units, and therefore, the Combat Points for each player must be kept down to a manageable level. *WINGS* is a simultaneous movement game, and orders must be written for every unit, every Turn. You should not try to control the large number of units it is possible to control in games using sequential movement; if you want

a large game, try the Mass Game included in this rulebook. The smaller number of units in *WINGS* can keep a single player very busy and involved in the game. About three planes (only one or two for Duel Games) plus some Non-Plane units, whatever can be handled on one side of a Command Sheet, is the most that all but the most experienced players can handle in a reasonable amount of time. Game requiring more units should be played as multi-player games.

The second item to keep in mind is that, except for pure dogfights, every scenario should have an objective of some sort. An objective gives the game a reason for happening, and forces the players to do *something*.

The following Options can be used to vary parts of the set up procedure for given scenarios, or as part of the set up process for your own scenarios. Any or all of these may be used, as the players wish. All Options could be given for a scenario, determined by mutual agreement, or decided by using the Charts and Tables whose use is covered below. All Charts and Tables mentioned are on the Set Up Card.

A. OPTIONAL TERRAIN SET UP:

1. GROUND TERRAIN SET UP: Place the Ground Terrain units as specified in the scenario, or as desired for your own scenario design. Their Altitude Levels can be varied by mutual agreement.

2. SKY TERRAIN SET UP: Sky Terrain consists of the Sun and Cloud units.

a. CLOUD UNITS: The Cloud units may be used to represent individual clouds, or "breaks" in otherwise solid cloud banks. The "hollow", circular Cloud units may be considered solid clouds, or actually "hollow". Regardless of how they are used, their Altitude Levels must be determined. The Altitude Levels of each individual Cloud unit, or of a solid cloud bank, can be determined by using the *Cloud Altitude Table*. Roll the two dice *twice* for each set of Altitude Levels needed, and crossgrid the numbers rolled with the "Altitude Level" column. The highest and lowest Altitude Levels produced by these rolls are the highest and lowest Altitude Levels of the cloud formation. Roll again if both Altitude Levels are identical.

b. THE SUN UNIT: The Direction Arrow on the Sun unit indicates its location in the sky. Roll one die, and point the Direction Arrow in the Direction corresponding to the hexside number of Directional Hexagon "A" that matches the number rolled (if mapboard section "AB" is not used in the game, designate any other Directional Hexagon as reference, before the die is rolled). The Sun unit itself can be placed in any out of the way hex, as it is not actually on the mapboard.

B. VISIBILITY CONDITIONS: Visibility Conditions may be determined by using the *Visibility Conditions Table*. Roll the two dice, and crossgrid the number rolled with the "Vis. Cond. Mod." column to find the Visibility Conditions Modifier that applies for the game.

C. WIND DIRECTION AND FORCE: The Wind Direction and Wind Force may be determined by using the *Wind Tables*. Roll the two dice *twice*. Crossgrid one roll with the "Wind Direction" column to find the Wind Direction (based on Directional Hexagon "A", or, if mapboard section "AB" is not used, on any Directional Hexagon announced before the dice are rolled), and the other roll on the "Wind Force" column to find the Wind Force. It may help to note this somewhere for later reference.

D. BATTLE LOCATION: The Battle Location may be determined by using the *Battle Location Tables*. Roll the two dice and crossgrid the number rolled with the appropriately lettered column to find the Battle Location. Each "Distance Number" represents roughly five to seven miles. After the Battle Location is determined, the players should decide by mutual agreement or competitive die rolls what their "Home Territory Directions" (the direction the planes must fly to return to friendly territory) are (Defenders are already in Home Territory, and don't need one).

The distances and locations in the variously lettered columns are based on the locations of typical missions. The "A" column shows that Zeppelins were usually encountered far over the ocean (neutral territory), or far over Allied territory. An escorted Zeppelin would have to be closer to home — probably an "A-1" or "A-3". The "B" column shows that Balloon and Tactical attacks generally took place only a few miles behind the enemy lines. The "C" column shows that dogfights could take place over or near "no man's land" ("N-½"), or up to about twenty miles behind the front lines. The Central Power fighters crossed the lines less often than their Allied counterparts, and generally penetrated less distance. The "D" column shows that observation and photographic missions behind enemy lines could be close to or quite some distance from the front lines. The "E" column shows that higher altitude bombing missions could often be some distance behind the front lines. Fighter escort would be unlikely beyond a "D-5" Battle Location. The "F" column shows that Smoke Screen and Strafing missions were right over the enemy front lines. The "G" column shows that planes were normally based between six and twenty miles behind the front lines. The "H" column shows that Zeppelin sheds and harbors were fairly long-range affairs, and, therefore, rarely attacked. The "I" column is based on the probable proximity of friendly land or ships from the Battle Location.

E. OPTIONAL UNIT SELECTION: More varied forces can be selected using these Options.

1. THE POINT SELECTION OF FORCES: The players use the number of Combat Points for their side to "purchase" units. The "cost" of each unit is its Combat Point Value. The Combat Points may be used to "purchase" any types of units available for the side or country in the time period of the game.

2. CREW QUALITY DETERMINATION: After the units are selected, their Quality may be determined by rolling the two dice once for each Crewman, and consulting the *National Crew Rating Chart* and the *Crew Quality Determination Tables*.

a. Decide the nationalities involved. Then, crossgrid on the *National Crew Rating Chart* the nationality with the time period. The Roman Numeral found is the "National Crew Rating".

b. Now go to the *Crew Quality Determination Tables*. The numbers rolled are crossgridded with the appropriate "National Crew Rating" to find the Quality Rating for each Crewman. *For example, in the "IV" column, if a "22" is rolled, this falls in the range of numbers "21-23". Going to the left from "21-23", the Crewman is found to be of "C" (Green) Quality, and initially worth 60 Quality Points.*

(1) It is possible for planes to carry crews of mixed Quality.

(2) These Tables do not generate any "Super Aces", but can produce Aces with five "kills". If Experienced Quality is rolled, the two dice should be rolled again to determine if the Crewman is a five "kill" Ace. The use of Aces with over five "kills" may only be by scenario design or mutual agreement.

c. Write the letter notations for the Crew Quality of each Crewman next to the Crew identification numbers in the Hit Records.

3. COMBAT POINT VALUE MODIFICATION: The determination of Quality for Crewmen may alter a side's Combat Point Value for a scenario, and could make a difference in determining a winner. The *Combat Point Values Modified For Quality Chart* shows how the Quality of units can modify their Combat Point Values.

a. Depending on the Crew Quality and the number of "kills", the Combat Point Value of a unit is multiplied by the appropriate number found in this Chart. *For example, an "F" Quality Pilot for an Albatros D.III (Data Card 72) would be "1.1" (found by crossgridding "F" with "0-4" "kills") times "30" (the normal Combat Point Value for the plane) equals "33" Combat Points.* Round all fractions upward.

b. If a unit has Crewmen of mixed Quality, mulitply the normal Combat Point Value of the unit times the appropriate number for each Crewman, then add these together and divide by the number of Crewmen for the final number of Combat Points.

4. PERSONAL CREW CHARACTERISTICS DETERMINATION: These may be determined for each Crewman by using the *Personal Crew Characteristics Table*. Roll the two dice once for each Characteristic, and crossgrid the number rolled with the appropriate column. This information should be recorded on one Crew Log Sheet for each Crewman.

F. BALANCING SCENARIO VICTORY CONDITIONS: Games are won or lost depending on the number of Victory Points gained by each side. It is easy to see that,

with two forces with equal numbers of Combat Points, the side that gains the most Victory Points is clearly the winner. It is much harder to balance games where one side has appreciably more Combat Points in the game than the other side, either due to the original scenario design, or because of the Quality determined for the units chosen. How well the smaller force does has to be evaluated based on the disparity in the Combat Point Values of the two sides. The procedure below can be used to balance games with unequal forces.

1. When the game is over, both sides count all of the Victory Points gained during the game. If the weaker (in original number of Combat Points at the start of the game) side has gained more Victory Points, the weaker side has won the game quite handily. However, if the stronger side has gained more Victory Points, the situation must be evaluated further.

2. Both sides should take the number of Victory Points they gained, and divide that number by the number of Combat Points they had at the start of the game. Multiply the result by "100". *For example, a side that had 200 Combat Points at the start of a game gained 100 Victory Points. 100 ÷ 200 = .50 x 100 = "50".* If the weaker side has a larger number than the stronger side, the weaker side has won the game. However, if the stronger side has a larger number, the situation must be evaluated still further.

3. Subtract the weaker side's number from the stronger side's number. The result is the "Victory Point Number".

4. Crossgrid the number of Combat Points that the stronger side had at the start of the game with the number of Combat Points that the weaker side had at the start of the game on the *Victory Points Differential Table*, below (use the listed numbers closest to the actual number of Combat Points). The number found is the "Victory Point Differential Number".

VICTORY POINT DIFFERENTIAL TABLE

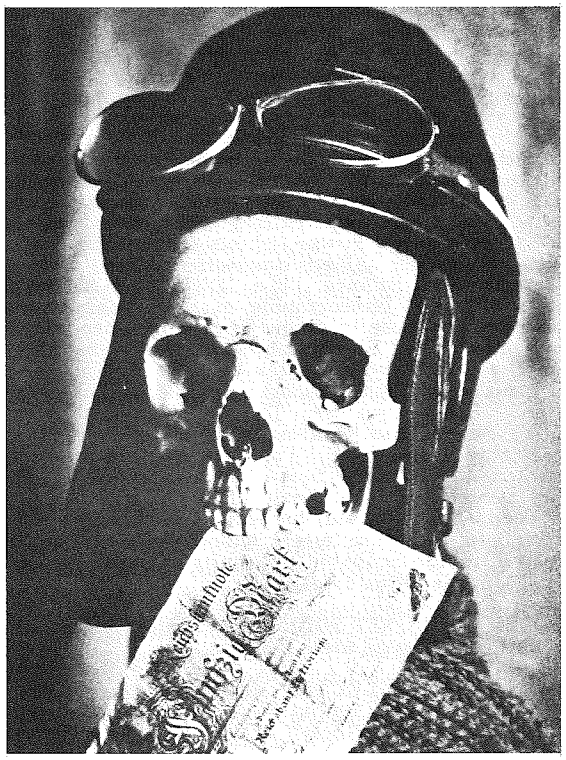
LARGER POINT TOTAL	SMALLER POINT TOTAL																								LARGER POINT TOTAL
															300	325	350	375	400	425	450	475	500		
125	20														60	48	40	32	24	16	12	08	04		525
150	40	16														52	44	36	28	20	16	12	08		550
175	60	36	12													60	48	40	32	28	20	16	12		575
200	●	48	24	08													56	48	40	32	24	20	16		600
225	●	60	40	20	08												60	52	44	36	28	24	20		625
250	●	●	60	32	20	08												56	48	40	32	28	24		650
275	●	●	●	44	28	16	08											60	52	44	40	32	28		675
300	●	●	●	56	40	24	16	04											60	48	44	36	32		700
325	●	●	●	60	48	32	24	12	04											56	48	40	36		725
350	●	●	●	●	60	44	32	20	12	04										60	52	44	40		750
375	●	●	●	●	●	52	40	28	20	12	04										56	48	44		775
400	●	●	●	●	●	60	48	36	24	16	08	04									60	52	48		800
425	●	●	●	●	●	●	56	40	32	24	16	08	04									56	52		825
450	●	●	●	●	●	●	60	48	40	28	20	16	08	04								60	56		850
475	●	●	●	●	●	●	●	56	44	36	28	20	12	08	04								60		875
500	●	●	●	●	●	●	●	60	52	40	32	24	20	12	08	04									
LARGER POINT TOTAL	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475									LARGER POINT TOTAL
	SMALLER POINT TOTAL																								

5. If the Victory Point Differential Number found in the Chart is larger than the Victory Point Number, the weaker side has won. If the Victory Point Number is equal to or larger than the Victory Point Differential Number, the stronger side has won.

6. For very small games, where the number of Combat Points on one or both sides is less than one hundred, use multiples of their Combat Point Values on the Victory Points Differential Table. *For example, the Victory Point Differential Number is the same if 30 Combat Points face 25 Combat Points, as if 300 Combat Points face 250 Combat Points.* Always multiply by "10", if possible, by "5", if "10" will not show on the Chart.

7. Treat planes on the ground as if their original Combat Point Value were half what it actually is. Round all fractions up.

8. Treat the "Defender's" total Combat Point Value as if it were twenty percent more than it actually is if the Battle Location Distance Number is "D-4", or greater.



This popular World War I German photograph comments on the monthly "danger pay" (50 marks — about 13 dollars) paid to German fliers.

GAME REFERENCE MATERIAL

I. HINTS ON PLAY

"Here's a toast to the dead already;
And hurrah for the next man who dies." — World War I Mess Song.

The fliers of World War I invented aerial warfare. The tactics, organization, and traditions of all modern air forces can be traced back to that conflict. By 1916, the starting date of this game, the early, often fumbling, efforts to man, equip, organize, arm, and train the national air arms had culminated in air forces of a quite modern pattern.

To modern eyes, the planes were flimsy and unreliable, the training dangerously slip-shod, and the casualties devastating. *WINGS* duplicates the most important features of World War I air warfare, and some general suggestions for success are covered below:

A. COORINATION, FORMATION, AND FACING: A fighter attack is much harder to avoid if some fighters attack while others move to cover possible escape routes. That way, *somebody* is bound to get a shot. For larger and less maneuverable planes, tight formations at staggered altitudes allow the planes to provide mutual protection. The World War I two-seater could be a formidable opponent for contemporary fighters, and tight formations further enhance their value. Face opponents with your best firepower, Fighters should always face their opponents with their fixed guns, never turn away from a potential attack. A head-on pass beats having an enemy on your tail.

B. ALTITUDE: A higher plane can dive to attack or climb to escape, and, thus, has the precious advantage of "initiative". In the words of Great Britain's premier ace of the war, "Mick" Mannock (73 "kills"), "Always above, seldom on the same level, never underneath.

C. PLANE CHARACTERISTICS: Every plane has strong and weak points that can be exploited. In what ways is your plane superior to the opposing plane? In what ways is your plane inferior to the opposing plane? What tactics will enable you to exploit your advantages in the particular situation? Study of the Data Cards, and practice with the game will help you make these decisions.

D. FIRING: If the Gun Jamming rules are used, it is very important not to waste shots. Long bursts at long range could mean jammed guns when the range closes. Get close before opening fire, or at least keep longer range shots to a minimum, and the bursts short.

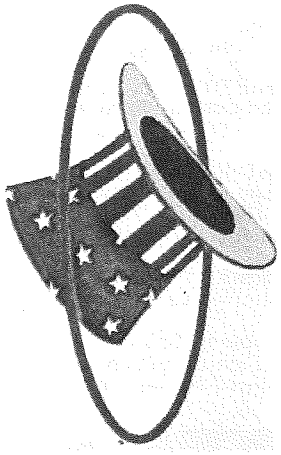
E. TACTICAL SITUATION: Examine the current tactical situation, and try to visualize how it will develope during the following Turns. Plan ahead to be in a position to take advantage of possible future situations.

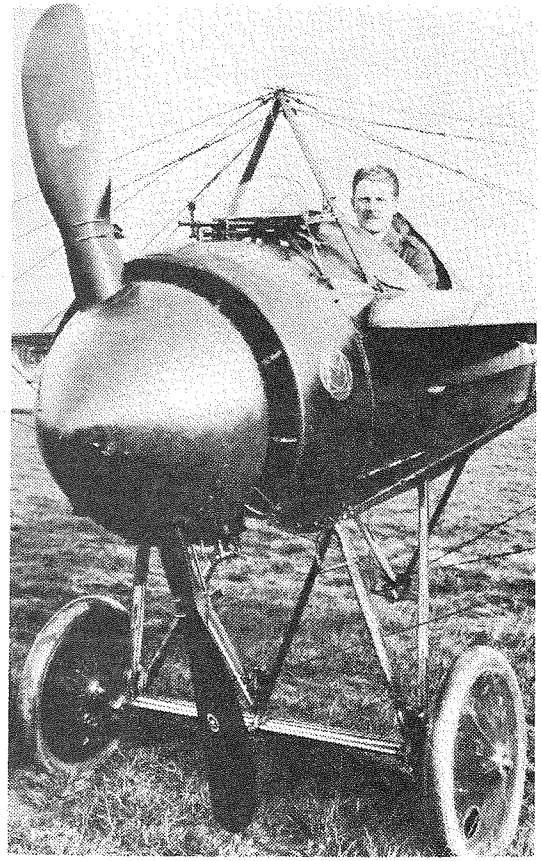
II. DESIGNER'S NOTES

Back in early 1976, I designed a game on World War II plane-to-plane combat in Western Europe called *AIR FORCE* for Battleline Publications. This game proved popular enough to lead to a sister game, *DAUNTLESS*, on the Pacific Theater, and finally to an Expansion Kit. The whole series is now owned by the Avalon Hill Game Company. I still take quite a bit of pride in the game system used in that series of games, but now, in 1981, that game system is over five years old, and is no longer really "state of the art" in wargame design. *WINGS* presents a new and improved game system that, while being radically different in many ways, maintains the playability of the earlier game system while being far more accurate, adaptable, and flexible.

Every tactical game requires a point of "focus", and, for *WINGS*, that point is plane-to-plane combat. The land and sea portions of the game are less detailed and far more abstract than the air-to-air systems, although their proper relationship to the planes is shown, even if in less detail. For plane-to-plane combats, this design focus allows the players to represent, in as much detail as they wish to handle, not only the characteristics of the individual planes, but also the characteristics of the individual Gun Positions and Crewmen.

A second game (as yet untitled) to supplement *WINGS* is planned for release in 1982 or 1983. This game will contain an additional fifty Data Cards and their accompanying Plane units, additional Optional Rules and Scenarios, and a complete "Strategic Game" that can be played independently, or used to generate tactical games using the *WINGS* rules. Together, the two games should present the most complete and detailed look at World War I in the air ever presented in game form.





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To receive an answer, rules questions *must* be accompanied by a stamped, self-addressed envelope. Questions should be phrased so they can be answered with a "yes" or "no", or other very short answer.

SEQUENCE OF PLAY USING ALL OPTIONS

1. THE SIGHTING PHASE (OP): All Sighting Attempts are announced and resolved. Be sure to consider the effects of Bank and Nose Attitudes, and blind areas.

2. THE ORDER PLOT PHASE: All players secretly write the orders for each of their units for the current Turn on their Command Sheets. Plot "Archie" for future Turns.

3. THE NEW INITIALS PLOTTING PHASE: The new Initial Speed, Initial Altitude, and Initial Bank are entered in the next line of each unit's Combat Unit Column.

4. THE NON-PLOTTED ORDER EXECUTION PHASE (ADV & OP): All actions for which no written orders are plotted are executed, in the following order:
a. All Non-Plane units are moved, turned, and/or change altitude. Solitaire rolls are made, and the results executed.
b. Turn all Flexible Gun units on planes, ships, balloons, and Zeppelins.
c. Move all Torpedo units Straight Ahead. Stop if a hex containing a Ship unit is entered, and resolve the Torpedo Hit.
d. Make the three automatic Clearing Gun Jam attempts on Gun or Solitaire Flexible Gun units. No firing is allowed if the third attempt is successful, but firing is allowed if the first or second attempt is successful. Units for which these attempts are made may not have been turned.
e. Announce which non-plotted Gun or Solitaire Flexible Gun units are Reloading, and mark on their Hit Records. Units that are Reloading may not have been turned.

5. THE PLOTTED ORDER EXECUTION PHASE: All units with plotted orders are *simultaneously* moved *exactly* as their orders were plotted. Adjustments, announcements, and resolutions also take place during this Phase, in any convenient order:
a. Rewrite illegal plots, and adjust the movement accordingly.
b. Resolve Collisions.
c. Announce Landings. Resolve Crash Landings.
d. Announce and resolve Clearing Gun Jam Attempts — erase the "J", if successful.
e. Announce Gun Reloadings.
f. Fire Rockets, Drop Loads, and handle Jettisonings. Mark Smoke.
g. Check Exceeding Limits Situations, and resolve.

6. THE GUNFIRE PHASE: Gunfire is resolved simultaneously, all hits are marked, and all destroyed units removed from play. Depending on the rules in use, this may involve:
a. Confirm hits on armored planes.
b. Check Target Identification.
c. Resolve Special Hits as they occur.
d. Mark off Ammunition Factor expenditures.
e. Check Jams as Guns are fired.
f. Check Exceeding Limits Situations that apply *after* all hits are marked.
g. Resolve hits from an exploding Balloon or Zeppelin.

7. THE "ARCHIE" PHASE (OP): Announce where all "Archie" for the current Turn was plotted, and resolve any hits.

8. THE SPECIAL EVENTS PHASE (OP): A variety of events are checked in the following order:
a. Resolve Fire Damage.
b. Resolve attempts at Spin Recovery prior to mid 1916.
c. Resolve attempts to "wake up" Crewmen.
d. Resolve attempts to recover from Uncontrollable Maneuvers.
e. Resolve attempts to Bail Out.
f. Resolve Fire Fighting attempts.
g. Attempt to start Engines for planes on the ground.

THE DUEL GAME SEQUENCE OF PLAY

1. THE DUEL GAME SIGHTING PHASE (OP): This Phase is handled exactly the same way as the regular Sighting Phase.

2. THE DUEL GAME ORDER PLOTTING AND EXECUTION PHASE: The events of the normal Order Plot Phase, Non-Plotted Order Execution Phase, Plotted Order Execution Phase, Gunfire Phase, and "Archie" Phase all take place and are resolved order by order, as dictated by the *Impulse Charts*.

3. THE DUEL GAME END TURN PLOTTING PHASE: Speed Changes (Power or Brake Factors) are plotted, and new Initials are calculated and plotted.

4. THE DUEL GAME SPECIAL EVENTS PHASE (OP): The Phase is handled exactly the same way as the regular Special Events Phase.

MANEUVER REFERENCE CHART

MANEUVER NAME	REQ. STARTING BANK ATTITUDE	DASHES REQUIRED	DASHES EXECUTION	REQUIRED ALT. CHG.	SPEED FACTORS COST	SPEED FACTORS LOSS	MANEUVER EXECUTION
Straight Ahead	Any	None	————	None	1	0	1 hex Straight Ahead ①
Bank (BL or BR)	Any	Bank	St. Ahead	None	1	0	Change Bank Attitude ①
Slip Left	UL, PL, IL	Slip	St. Ahead	D3	1	1	1 hex to left
Slip Right	UR, PR, IR	Slip	St. Ahead	D3	1	1	1 hex to right.
Spin	Any	None	————	Max. Dive	1	0	Roll die for turning ⓐ ①
Turn Left	UL, PL, IL	Turn	St. Ahead	None	1	1	1 hexside turn to left ②
Turn Right	UR, PR, IR	Turn	St. Ahead	None	1	1	1 hexside turn to right ②
Bar. Roll Left	Any	2X Rolls	ⓑ	None	1	1	1 hex Straight Ahead
Bar. Roll Right	Any	2X Rolls	ⓒ	None	1	1	1 hex Straight Ahead
Cl. Half-Loop	UR, UE, UL	H-LP/IMM	St. Ahead	C. Zoom #	1	1	180° facing, opp. Bank
Dv. Half-Loop	IR, IE, IL, PR, PL	H-LP/IMM	St. Ahead	D.2XZoom #	1	1	180° facing, opp. Bank
Half-Roll Left	Any	Rolls	ⓓ	None	1	1	1 hex Straight Ahead
Half-Roll Right	Any	Rolls	ⓔ	None	1	1	1 hex Straight Ahead
Cl. Immel. Left	Any but PL, PR	H-LP/IMM	St. Ahead	C. Zoom #	1	1	180° facing, 1 hex to left ①
Cl. Immel. Right	Any but PL, PR	H-LP/IMM	St. Ahead	C. Zoom #	1	1	180° facing, 1 hex to right ①
Dv. Immel. Left	Any	H-LP/IMM	St. Ahead	D.2XZoom #	1	1	180° facing, 1 hex to left ②
Dv. Immel. Right	Any	H-LP/IMM	St. Ahead	D.2XZoom #	1	1	180° facing, 1 hex to right ②
Skid Left	UR, PR, IR	Skid	St. Ahead	None	1	1	1 hex to left, 1-2 Turns Right
Skid Right	UL, PL, IL	Skid	St. Ahead	None	1	1	1 hex to right, 1-2 Turns Left
Clear Gun Jam	UR, UE, UL	None	————	None	1	0	1 hex Straight Ahead ⓕ ①
Drop (DB, DG, DS)	UR, UE, UL	None	————	None	1	0	1 hex Straight Ahead ⓕ ①
Drop Torpedo	UE	None	————	None	1	0	1 hex Straight Ahead ⓖ ①
Fire Rockets	Any	None	————	None	1	0	1 hex Straight Ahead ①
Jettison	UR, UE, UL	None	————	None	1	0	1 hex Straight Ahead ①
Photograph	UE	None	————	None	1	0	1 hex Straight Ahead ⓗ ①
Reload Gun	UR, UE, UL	None	————	None	1	0	1 hex Straight Ahead ①

NOTES: ① Snap Maneuvers of these Maneuvers are not possible. No Snap Maneuvers possible in Dive Speed Increment.
② Snap Maneuvers only possible if in a Perpendicular Bank Attitude.
ⓐ Right if in Right Bank Attitudes, Left if in Left Bank Attitudes, controller's choice if in Level Bank Attitudes. ⓑ Alternate Left, ahead for first half, then right, ahead for second half. ⓒ Alternate right, ahead for first half, then left, ahead for second half. ⓓ Alternate left, ahead. ⓔ Alternate right, ahead. ⓕ Cannot be performed in Dive Speed Increment. ⓖ No higher than 2 Altitude Levels above the water, no faster than 4 Speed Factors for a successful Drop Torpedo. ⓗ Must be in the Level Speed Increment, with a Horizontal Nose Attitude.

SUGGESTED PLANE CHARTS

	COUNTRY	FIGHTER 1916 E	FIGHTER 1916 M	FIGHTER 1916 L	FIGHTER 1917 E	FIGHTER 1917 M	FIGHTER 1917 L	FIGHTER 1918 E	FIGHTER 1918 M	FIGHTER 1918 L	OBSERVATION AND RECON. 1916 E	OBSERVATION AND RECON. 1916 M	OBSERVATION AND RECON. 1916 L	OBSERVATION AND RECON. 1917 E	OBSERVATION AND RECON. 1917 M	OBSERVATION AND RECON. 1917 L	OBSERVATION AND RECON. 1918 E	OBSERVATION AND RECON. 1918 M	OBSERVATION AND RECON. 1918 L
ALLIED	Belgium	6	6	11	13	18	19	19	23	23	4a	8	32	36	28	28	16	16	16
ALLIED	France	6	11	13	13	19	19	23	23	23	8	8	28	28	28	28	21	21	21
ALLIED	Great Britain	27	35	35	35	41	45	45	45	50	30	32	36	36	36	36	36	36	36
ALLIED	Italy	6	6	11	13	18	19	56	56	56	8	8	8	8	54b	54b	54c	54c	54c
ALLIED	Russia	6	6	11	13	13	13	–	–	–	4a	4a	32	28	28	28	–	–	–
ALLIED	U.S.A.	–	–	–	–	–	–	45	23	23	–	–	–	–	–	–	21	21	21
CEN	Austria-Hungary	61	61	68d	68d	72e	72e	98f	82g	100	60h	60h	63	63	63	97	97	97	97
CEN	Germany	61	68k	68l	72	75	78	82	86	86	60	63	70	70	70	79	84m	84m	84m

	COUNTRY	BOMBER 1916 E	BOMBER 1916 M	BOMBER 1916 L	BOMBER 1917 E	BOMBER 1917 M	BOMBER 1917 L	BOMBER 1918 E	BOMBER 1918 M	BOMBER 1918 L	GROUND ATTACK 1916 E	GROUND ATTACK 1916 M	GROUND ATTACK 1916 L	GROUND ATTACK 1917 E	GROUND ATTACK 1917 M	GROUND ATTACK 1917 L	GROUND ATTACK 1918 E	GROUND ATTACK 1918 M	GROUND ATTACK 1918 L
ALLIED	Belgium	4a	4a	32	32	36	16	16	49	49	4n	4n	4n	36	36	16	16	16	16
ALLIED	France	4a	4a	4a	28	16	16	16	16	16	4n	4n	4n	4n	16	16	16	16	16
ALLIED	Great Britain	30	30	30	38	38	49	49	48	48	30	30	30	30	42	42	42	42	42
ALLIED	Italy	4a	4a	4a	4a	53	53	53	53	53	4n	4n	4n	4n	4n	54b	54c	54c	54c
ALLIED	Russia	4a	4a	32	28	28	28	–	–	–	4a	4a	4a	4a	28	28	–	–	–
ALLIED	U.S.A.	–	–	–	–	–	–	16	16	16	–	–	–	–	–	–	21	16	16
CEN	Austria-Hungary	60h	63	63	63	73i	73i	73i	73i	73i	60h	63	63	63	63	97	97	97	97
CEN	Germany	60	63	63	73i	73j	77	77	77	77	60	63	63	63	74	80	80	84y	84y

	COUNTRY	SHIPPING ATTACK 1916 E	SHIPPING ATTACK 1916 M	SHIPPING ATTACK 1916 L	SHIPPING ATTACK 1917 E	SHIPPING ATTACK 1917 M	SHIPPING ATTACK 1917 L	SHIPPING ATTACK 1918 E	SHIPPING ATTACK 1918 M	SHIPPING ATTACK 1918 L
ALLIED	Belgium	4	4	32	32	36	16	16	49	49
ALLIED	France	4	12	12	12	12	12	12	53	23p
ALLIED	Great Britain	24q	24r	24r	38s	38s	38s	49	49	49
ALLIED	Italy	93t	93t	12	12	12	12	53	53	56u
ALLIED	Russia	4a	4a	12	12	12	12	–	–	–
ALLIED	U.S.A.	–	–	–	–	–	–	–	49	49
CEN	Austria-Hungary	93v	93v	93v	95w	95w	95w	95x	95x	95x
CEN	Germany	63	67	67	67	67	67	67	67	67

a : LAS version.
b : PD version.
c : PE version.
d : Oeffag version.
e : Oeffag version.
f : D. I version.
g : Oeffag version.
h : B. III version.
i : G. IV version.
j : G. V version.
k : D. I version.
l : D. II version.
m: Standard version.
n : LBS version.
p : Spad 14 version.
q : 225 hp version.
r : 240 hp version.
s : Westland version.
t : Macchi version.
u : Seaplane version.
v : L version.
w: 185 hp version.
x : 230 hp version.
y : Armored version.
E: Early.
M: Mid.
L: Late.

WINGS SET UP CARD

GUN UNIT INFORMATION CHART

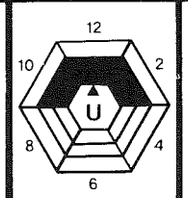
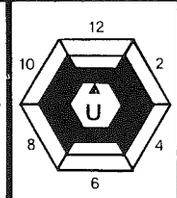
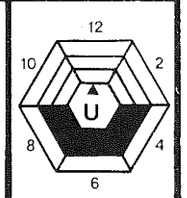
GUN UNIT TYPE	SYMBOL	TYPE	HEXSIDES /TURN	AMMUNITION	RANGE
Machinegun	(3)	Belt Machinegun	2/Turn	56	12
	(3)	Mag. Machinegun		6 x 3	12
	((3))	Hvy. Machinegun		28	12
Automatic Cannon	((CN))	Automatic Cannon	1/Turn	24	16
Heavy Gun	(A)	"Archie"	1/2 Turns	Limber	∞
	(F)	Field Gun			—

SHIP INFORMATION CHART

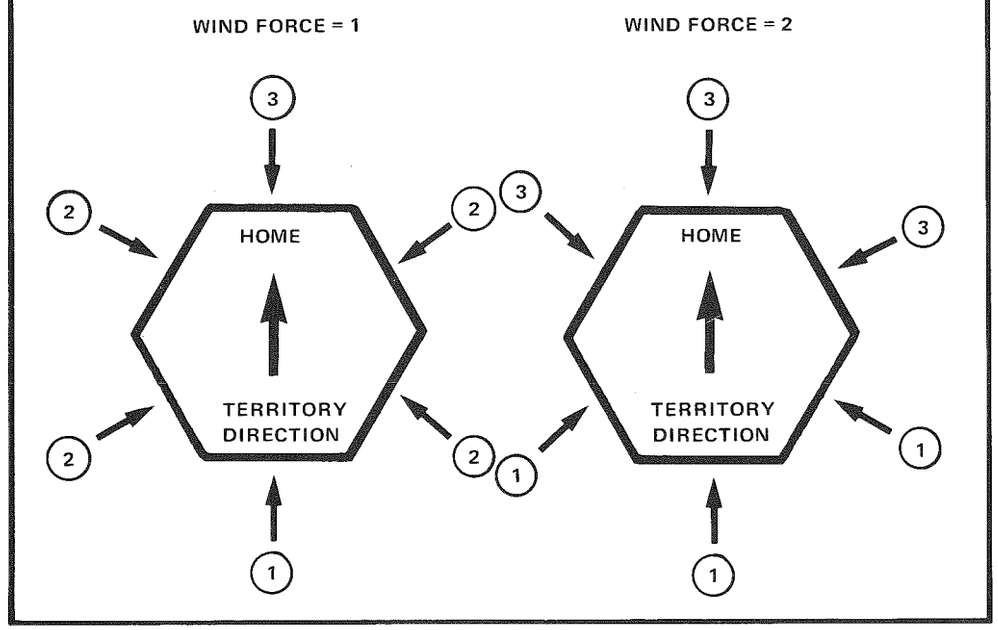
TYPE	STRUCTURE HITS	HEIGHT	MAX. SPEED	SP. CHG.	TURN NO.	GUN POSITIONS	POINTS
Large Escort	4	2	2	1	5	A, B, C	(60) 600
Escort	3	1	1	1	3	A, C	(45) 400
Small Escort	2	1	1	1	2	A	(25) 200
Submarine	1	1	1	1	2	C	(20) 250

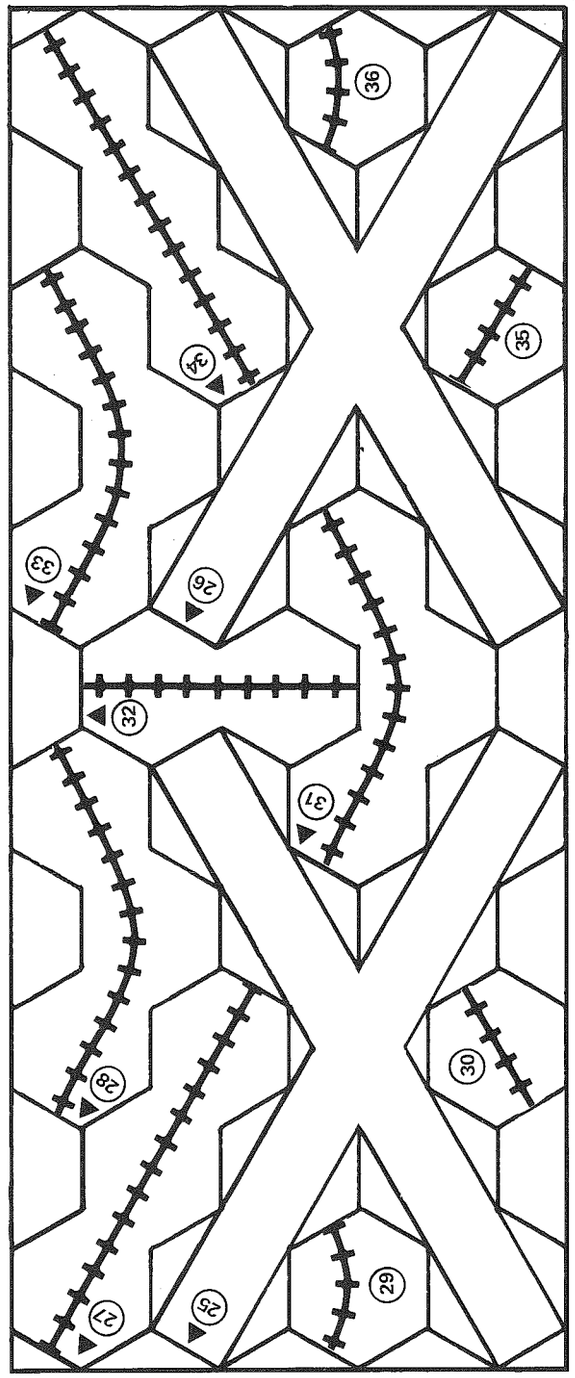
STANDARD SHIP DATA (Use with all Ship Types).
FLEXIBLE GUN TURNING: 2/Turn. **BRAKE & POWER FACTORS:** 1.
RELOAD TIME: 1 Turn. **SIZE MODIFIER:** Equals hexes unit occupies (Sighting only).

SHIP GUN CHARACTERISTICS

GUN POS.	A (3)	B ([3])	C (3)
RANGE	12	12	12
OPER.	Crew 1	Crew 2	Crew 3
AMMO (OP)	56	28	56
GUN PLAY			

GLIDE NUMBER DETERMINATION DIAGRAM





SCENARIO PERIOD SELECTION CHART

DICE	TIME PERIOD
11-13	Early 1916
14-23	Mid 1916
24-26	Late 1916
31-33	Early 1917
34-43	Mid 1917
44-46	Late 1917
51-53	Early 1918
54-64	Mid 1918
65-66	Late 1918

Early: Jan. – April
Mid: May – August
Late: Sept. – Dec.

CLOUD ALTITUDE TABLE

DICE ROLL	ALTITUDE LEVEL
11	160
12-13	240
14-16	320
21-24	400
25-33	480
34-43	560
44-52	640
53-56	720
61-63	800
64-65	880
66	960

BATTLE LOCATION TABLES

DICE ROLL	BATTLE LOCATION A	B	C	D	E	F	G	H	I
11-13	N-1	D-1	N-½	D-½	D-3	D-1/6	D-1	D-6	N-1
14-16	N-3	D-1	N-½	D-½	D-3	D-1/6	D-1	D-6	N-1
21-23	N-6	D-1	A-1	D-1	D-3	D-1/6	D-2	D-7	N-2
24-26	N-10	D-1	A-1	D-1	D-3	D-1/6	D-2	D-7	N-2
31-33	A-1	D-1	A-2	D-2	D-3	D-1/6	D-2	D-8	D-1
34-36	A-3	D-1	A-2	D-2	D-4	D-1/6	D-2	D-8	D-1
41-43	A-6	D-1	C-1	D-3	D-4	D-1/6	D-3	D-9	D-1
44-46	A-9	D-1	C-1	D-4	D-5	D-1/6	D-3	D-10	D-2
51-53	A-12	D-1	C-2	D-5	D-6	D-1/6	D-3	D-11	D-2
54-56	A-15	D-1	C-2	D-6	D-9	D-1/6	D-3	D-12	D-2
61-63	A-18	D-1	C-3	D-7	D-12	D-1/6	D-3	D-13	D-3
64-66	A-20	D-1	C-3	D-8	D-15	D-1/6	D-3	D-14	D-4

A: Allied Powers Territory.
C: Central Powers Territory.
D: Defender's Territory.
N: Neutral Territory.

WIND TABLES

DICE ROLL	WIND DIRECTION	WIND FORCE
11-16	1	0
21-26	2	0
31-36	3	0
41-46	4	1
51-56	5	1
61-66	6	2

VISIBILITY CONDITIONS TABLE

DICE ROLL	VIS. COND. MOD.	
11-36	0	
41-56	-1	
61-65	-2	Poor
66	-3	Poor

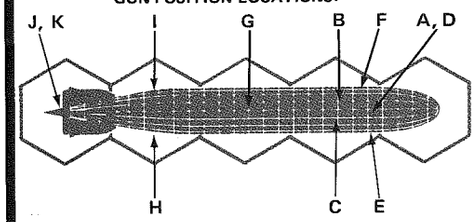
INDIVIDUAL ZEPPELIN INFORMATION CHART

MODEL	DATE AVAILABLE	SIZE MOD.	ENGINES	TURN NO.	MAX. SPEED	MAX. CEILING EMPTY	MAX. CEILING LOADED	GUNS	POINTS	NOTES
D	Mid 1915	+8	ABEG	12	3	470	350	ABCEFGHIJ	(74) 220	SL5-7
E	Early 1916	+9	ABEG	15	3	600	460	ABCEFGHIJ	(77) 390	SL8-19
F	Early 1917	+10	ABEFG	14	3	800	650	ABCEFGHIJ (a)	(82) 470	SL20-21
G	Mid 1917	+10	ABEFG	14	3	820	670	ABCEFGHIJ (a)	(83) 520	SL 22
M	Late 1914	+8	ABEG	13	3	450	320	ABCEFGHIJ	(76) 250	18 built
P	Early 1915	+8	ABEG	14	3	460	340	ABCEFGHIJ	(77) 400	22 built
R	Mid 1916	+13	ABCDEG	17	3	640	520	ABCEFGHIJ	(83) 520	L30, 32
V	Early 1917	+13	ABEFG	16	3	830	760	ABCEFGHIJ (a)	(84) 530	L42, 53
L70	Mid 1918	+14	ABCDEFG	18	4	920	800	DK	(85) 550	Last one.

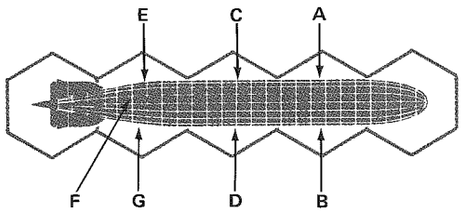
(a) Rearm with DK Guns in Early 1918. Add "20" to Maximum Ceilings.

STANDARD ZEPPELIN DATA (Use with all Zeppelin Models).
DEPTH: 3 Altitude Levels. **FLEXIBLE GUN TURNING:** 1/Turn. **BRAKE & POWER FACTORS:** 2
CLIMB & DIVE RATES: A maximum of 3 Altitude Levels per Turn. **RELOAD TIME:** 1 Turn.

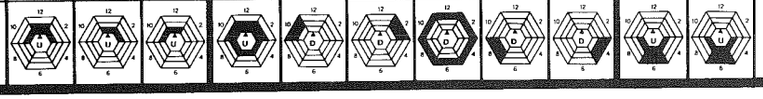
GUN POSITION LOCATIONS:



ENGINE LOCATIONS:



ZEPPELIN GUN CHARACTERISTICS

GUN POS.	A	B	C	D	E	F	G	H	I	J	K
	(3)	(3)	(3)	(CM)	(3)	(3)	(3)	(3)	(3)	(3)	(CM)
RANGE	10	10	10	5(10)	10	10	10	10	10	10	5(10)
OPER.	Crew 1	Crew 2	Crew 3	Cgnr 1	Crew 4	Crew 5	Crew 6	Crew 7	Crew 8	Crew 9	Crew 2
AMMO (OP)	2 x 14	2 x 3	2 x 3	12	2 x 3	2 x 3	2 x 3	2 x 3	2 x 3	2 x 14	12
GUN PLAY											

PERSONAL CREW CHARACTERISTICS TABLE

DICE ROLL	LUCK	EYESIGHT	ACCURACY	REFLEXES
11-13	-1	+1	+2	+1
14-16	-1	+1	+1	+1
21-56	0	0	0	0
61-63	0	0	-1	-1
64-66	0	-1	-2	-1

EFFECTS OF HITS CHART

WING ("W") HITS:
Plane destroyed when all are marked (All).
Maximum Dive Speed reduced by 1/2 hits (All).
= Use **Exceeding Limits Tables** if exceeded (OP).
Brake Factor reduced by 1/hit (All).
1/2 "W" hits: Advanced, Snap, or Spin Maneuvers = Plane destroyed (AG).
= Use **Exceeding Limits Tables** if performed (OP).

STRUCTURE ("S") HITS:
Plane destroyed when all are marked (All).
1/2 "S" hits: Advanced, Snap, or Spin Maneuvers = Plane destroyed (AG).
= Use **Exceeding Limits Tables** if performed (OP).

FUEL ("L") HITS:
Plane destroyed when all are marked (BG only).
All Engines must be turned off when all are marked (AG).
Excess Fuel hits are marked as "S" hits (AG).

CONTROL ("T") HITS:
Plane destroyed when all are marked (All).
Plane must enter additional hex/hit to perform Basic Maneuvers (All).
1 or 2 "T" hits: Advanced, Snap, or Spin Maneuvers = Plane destroyed (AG).
= Use **Exceeding Limits Tables** if performed (OP).

CREW ("C") HITS:
Crewman eliminated when all are marked (All).
Crewman with 2 hits passes out in Dive Speed Increment (All).
1 or 2 "C" hits: Advanced, Snap, or Spin Maneuvers = Crewman passes out (AG).
Plane destroyed when all Crewmen who could fly it are eliminated (All).
If passed out, plane is moved Straight Ahead and Dives at least 3 Altitude Levels.
No Brake Factors may be used (OP).
Wake up attempts are made on the **Special Hit Tables** (OP).

ENGINE ("E") HITS:
1 ENGINE: Engine eliminated when all are marked (All).
Power Factor reduced by 1/hit (All).
Plane destroyed when all are marked (BG only).
2 ENGINES: Power Factor reduced by 1, if at least 1 hit/Engine (AG).
Power Factor reduced by 2, if 2 hits/Engine (AG).
All Power Factors lost if one Engine eliminated (AG).
3 ENGINES: One Power Factor lost/Engine eliminated (AG).
When 2 Engines eliminated, assume third Engine stops (AG).
4 ENGINES: One Power Factor lost/Engine eliminated (AG).
When 2 Engines on same side, or any 3 Engines eliminated, assume other Engines stop (AG).
If use of all Engines is lost, plane may still Crash Land (AG) or Land (OP).
Load must be Dropped, Fired, or Jettisoned if Power Factor = "0", or the Engine must be turned off (OP). Excess Engine hits are marked as "S" hits (AG).

GUN ("G") HITS:
One Gun eliminated/hit (All).
Excess Gun hits are marked as "S" hits (All).

FIRE ("F") HITS:
Plane destroyed when one is scored (BG and AG).
Treat as "L" hit if **Special Hit Tables** are used (OP).

WINGS SET UP CARD

COMBAT POINT VALUES MODIFIED FOR QUALITY CHART

CREW RATING	NUMBER OF "KILLS" 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
A	.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
B	.90	.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
C	.95	1.00	1.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—
D	1.00	1.05	1.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
E	1.05	1.10	1.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
F	1.10	1.15	1.30	1.40	—	—	—	—	—	—	—	—	—	—	—	—	—
G	1.15	1.20	1.35	1.45	—	—	—	—	—	—	—	—	—	—	—	—	—
H	1.20	1.25	1.40	1.50	1.60	—	—	—	—	—	—	—	—	—	—	—	—
I	1.25	1.30	1.45	1.55	1.65	1.75	1.85	1.95	2.10	2.20	2.30	2.40	2.50	2.60	2.75	2.85	3.00

Round all fractions up. Average values for mixed Crews.

NATIONAL CREW RATING CHART

	COUNTRY	1916 E	1916 M	1916 L	1917 E	1917 M	1917 L	1918 E	1918 M	1918 L
ALLIED	Belgium	IV	IV	IV	IV	IV	IV	IV	IV	IV
ALLIED	France	IV	IV	V	V	V	V	V	V	V
ALLIED	Great Britain	VII	VII	VII	VII	II	III	III	VI	VI
ALLIED	Italy	V	V	V	V	V	V	V	V	V
ALLIED	Russia	II	II	II	I	I	I	—	—	—
ALLIED	U.S.A.	—	—	—	—	—	—	—	—	—
CEN	Austria-Hungary	IV	IV	IV	IV	IV	IV	IV	IV	III
CEN	Germany	VII	VII	VII	VIII	VIII	VIII	VIII	V	V
	All Ground Units	VI	VI	VI	VI	VI	VI	VI	VI	VI

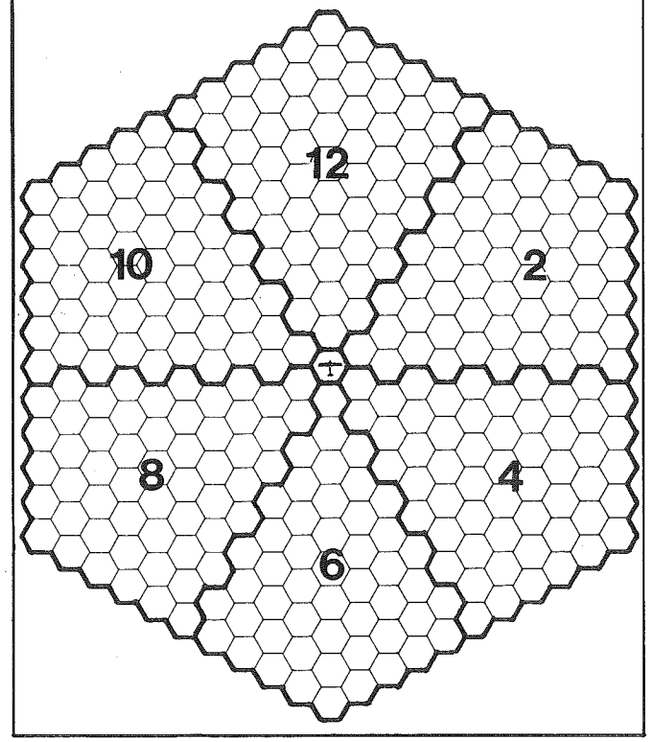
E: Early. M: Mid L: Late

CREW QUALITY DETERMINATION TABLES

CREW RATINGS		INITIAL QUALITY POINTS	NATIONAL CREW RATING I	II	III	IV	V	VI	VII	VIII
INEX	A (Raw)	10	11-23	11-16	11-13	11-13	11-14	11-14	11-12	11-13
INEX	B (Rookie)	40	24-36	21-26	14-16	14-16	15-22	15-22	13-14	14-16
INEX	C (Green)	60	41-53	31-36	21-23	21-23	23-25	23-26	15-16	21-23
NORM	D (Fair)	120	54-55	41-45	24-46	24-43	26-41	31-34	21-41	24-32
NORM	E (Average)	130	56-61	46-52	51-53	44-46	42-44	35-42	42-45	33-36
NORM	F (Good)	140	62-63	53-55	54-56	52-53	45-51	43-46	46-53	41-44
EXP	G (Crack) (a)	190	64	56-62	61-62	54-56	52-54	51-54	54-56	45-52
EXP	H (Elite) (b)	200	65	63-64	63-64	61-63	55-62	55-62	61-63	53-61
EXP	I (Pro) (c)	220	66	65-66	65-66	64-66	63-66	63-66	64-66	62-66

(a) Roll again. If "11-13", Crewman is a 5 "kill" Ace.
(b) Roll again. If "11-23", Crewman is a 5 "kill" Ace.
(c) Roll again. If "11-36", Crewman is a 5 "kill" Ace.

CLOCK REFERENCE DIAGRAM (ADV)



WINGS GAME CARD

SPECIAL HIT TABLES (OP)

MODIFIED DICE ROLL	ENGINE (E) I ⓐ ⓑ	ENGINE (E) R ⓐ ⓑ	FUEL (L or F) ⓐ ⓑ	CREW (C) HIT ⓐ	CREW (C) RECOVER	GUN (G) ⓑ	CONTROLS (T) HIT ⓐ	CONTROLS (T) RECOVER
11-46	NE	NE	NE	NE	NE	NE	NE	NE
51-56	NE	NE	NE	NE	W	NE	NE	V
61-64	NE	NE	F	P	W	NE	D	V
65	Q	NE	F	P	W	A	D	V
66	Q	NE	F	P	W	F	D	V
71-72	QF	Q	F	P	---	F	R	---
73-74	QF	QF	F	P	---	F	R	---
75+	QF	QF	F	P	---	F	R	---

MODIFIERS: ⓐ Second + Hit: +1. ⓑ Cannon or Incendiary Ammunition used: +1

NE: No additional effects or changes. Q: Engine quits. F: Fire starts. QF: Engine quits — Fire starts. P: Crewman passes out. W: Crewman wakes up. A: Ammunition destroyed. D: Uncontrollable Dive. V: Control regained. R: Uncontrollable Roll (1-3 = HL; 4-6 = HR).

GUNNERY TABLES

TOTAL BURSTS FIRED	FIXED AIR ACTUAL RANGE 1	2-3	4-5	6-7	8-10	FLEX. AIR ACTUAL RANGE 1	2-3	4-5	6-7	8-10	GROUND (OP) ACTUAL RANGE 1-2	3-4	5-6	7-8	9-16
1	3	2	2	1	1	2	2	2	1	1	3	2	2	1	0
2	5	4	3	3	2	4	4	3	2	2	5	4	3	2	1
3	8	6	5	4	3	6	6	5	4	2	8	6	5	4	1
4	10	8	7	5	3	8	8	6	5	3	10	8	7	4	2
5	13	10	8	6	4	9	9	8	6	4	13	10	8	5	2
6	15	13	10	8	5	11	11	9	7	5	15	13	10	7	3
7-9	20	17	13	10	7	15	15	12	9	6	20	17	13	8	3
Cannon	92	94	96	103	106	95	101	103	106	113	93	95	101	103	106

MODIFIER CHART

TOTAL BURSTS FIRED	(Plus or Minus) MODIFIER VALUE 1	2	3	4	5	6	7	8+
1	0	0	1	1	1	2	2	2
2	0	1	1	1	2	2	3	3
3	0	1	1	2	2	3	3	4
4	0	1	2	2	3	3	4	5
5	0	1	2	3	3	4	5	5
6	1	1	2	3	4	5	5	6
7-9	1	2	2	3	4	5	6	7
Cannon	1	2	3	4	5	6	7	8

NOTES: "Cannon Hit" if modified number rolled equals or exceeds the Cannon Hit Number. Incendiary Range is half normal Range. Roll twice for Heavy Machinegun hits.

HIT TABLE MODIFIERS

Size Modifier: On target's Data Card.
Firing while Inverted: -4.
Firing while Perpendicualr: -2.
Per firing Crew hit: -2/each.

(A) Target in Spin: -4.
(A) Target in Slip, Skid, or Roll: -2.
(A) Firing in Spin: -8.
(A) Firing in Slip or Advanced Maneuver: -6.
(A) Firing in Dive Speed: -2.

(OP) Steady Shot: +3.
(OP) Firing into Sun: -6
(OP) Inexperienced Firing: -1 to -3.
(OP) "Ace" firing: +1/5 "kills".

DEFLECTION MODIFIER CHART (ADV)

TARGET UNIT CLOCK POSITION	FIRING UNIT CLOCK POSITION 12	2 or 10	4 or 8	6	Up	Down
12	-4	-2	0	+3	-1	+1
2 or 10	-2	-3	-2	-1	-1	+1
4 or 8	0	-2	-3	-3	-1	+1
(Strafe) 6	+3	-1	-3	-3	-1	+1
Up	-1	-1	-1	-1	-1	+1
Down	+1	+1	+1	+1	+1	+1

HIT TABLES: Roll two dice and crossgrid in proper column to determine the types of hits.

DICE ROLL	HIT TABLE NUMBER C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	DICE ROLL
11	E	CE	CEW	CEW	CESW	CESW	CESW	CESSW	CESSW	CESSW	CESSW	CESSW	CELSSW	CELSSW	CELSSW	CELSSW	11
12	E	SW	SSW	SSW	SSSW	SSSW	SSSW	SSSSW	SSSSW	SSSSW	SSSSW	SSSSW	SSSSSW	SSSSSW	SSSSSW	SSSSSW	12
13	E	GS	CGS	CGS	CGSW	CGSW	CGSW	CCGSW	CCGSW	CCGSW	CCGSW	CCGSW	CCGSSW	CCGSSW	CCGSSW	CCGSSW	13
14	E	S	SS	SST	ESST	ESST	ESST	ESSTW	ESSTW	ESSTW	ESSTW	ESSTW	ESSTW	ESSSTW	ESSSTW	ESSSTW	14
15	E	W	EW	CEW	CESW	CESW	CESW	CEGSW	CEGSW	CEGSW	CEGSW	CEGSW	CEGSW	CEGSSW	CEGSSW	CEGSSW	15
16	S	C	CC	CCL	CCLT	CCLT	CCLT	CCLTW	CCLTW	CCLTW	CCLTW	CCLTW	CCLTW	CCLSTW	CCLSTW	CCLSTW	16
21	S	L	LS	LSW	LSW	LSW	LSSW	LSSW	LSSW	LSSW	LSSTW	LSSTW	LSSTW	GLSSTW	GLSSTW	GLSSTW	21
22	S	T	ET	EGT	EGT	EGT	EGST	EGST	EGST	EGST	EGSST	EGSST	EGSST	EGSSTW	EGSSTW	EGSSTW	22
23	S	W	TW	STW	STW	STW	ESTW	ESTW	ESTW	ESTW	ESTWW	ESTWW	ESTWW	CESTWW	CESTWW	CESTWW	23
24	S	---	E	ES	ES	EGS	EGS	CEGS	CEGS	CEGS	CEGS	CEGS	CCEGS	CCEGS	CCEGS	CCEGS	24
25	S	---	F	EF	EF	EFS	EFS	EEFS	EEFS	EEFS	EEFS	EEFS	CEEFS	CEEFS	CEEFS	CEEFS	25
26	S	---	W	SW	SW	CSW	CSW	CSTW	CSTW	CSTW	CSTW	CSTW	CESTW	CESTW	CESTW	CESTW	26
31	S	---	---	T	CT	CET	CET	CET	CET	CET	CETW	CETW	CETWW	CETWW	CETWW	CETWW	31
32	W	---	---	W	EW	EWW	EWW	EWW	EWW	EWW	EEWW	EEWW	EESWW	EESWW	EESWW	EESWW	32
33	W	---	---	S	SW	LSW	LSW	LSW	LSW	LSW	CLSW	CLSW	CLSTW	CLSTW	CLSTW	CLSTW	33
34	W	---	---	---	S	CS	CCS	CCS	CCS	CCS	CCSW	CCSW	CCSW	CCSW	CCFSW	CCFSW	34
35	W	---	---	---	W	TW	ETW	ETW	ETW	ETW	EGTW	EGTW	EGTW	EGTW	EEGTW	EEGTW	35
36	W	---	---	---	C	CE	CEW	CEW	CEW	CEW	CCEW	CCEW	CCEW	CCEW	CCESW	CCESW	36
41	W	---	---	---	---	W	SW	SW	ESW	ESW	EESW	EESW	EESW	EESW	EESWW	EESWW	41
42	C	---	---	---	---	S	FS	FS	FST	FST	FSST	FSST	FSST	FSST	FSSST	FSSST	42
43	C	---	---	---	---	W	CW	CW	CGW	CGW	CGSW	CGSW	CGSW	CGSW	CGSSW	CGSSW	43
44	C	---	---	---	---	---	T	T	TW	LTW	LTW	ELTW	ELTW	ELTW	EELTW	EELTW	44
45	C	---	---	---	---	---	L	L	LS	LSW	LSW	LSSW	LSSW	LSSW	LSSTW	LSSTW	45
46	C	---	---	---	---	---	W	W	WW	CWW	CWW	CSWW	CSWW	CSWW	CSWWW	CSWWW	46
51	C	---	---	---	---	---	---	E	ES	ESS	ESS	ESS	ESSW	ESSW	ESSW	ESSSW	51
52	C	---	---	---	---	---	---	W	CW	CSW	CSW	CSW	CSTW	CSTW	CSTW	CESTW	52
53	T	---	---	---	---	---	---	S	SS	ESS	ESS	ESS	ESSW	ESSW	ESSW	ESSWW	53
54	T	---	---	---	---	---	---	---	E	ET	ET	CET	CET	CET	CCET	CCETW	54
55	T	---	---	---	---	---	---	---	S	CS	CS	CFS	CFS	CFS	CCFS	CCFSW	55
56	T	---	---	---	---	---	---	---	T	TW	TW	TWW	TWW	TWW	LTWW	LTWWW	56
61	L	---	---	---	---	---	---	---	---	S	S	ES	ES	EES	EES	EESS	61
62	L	---	---	---	---	---	---	---	---	W	W	GW	GW	GTW	GTW	EGTW	62
63	G	---	---	---	---	---	---	---	---	L	L	LS	LS	LSS	LSS	FLSS	63
64	G	---	---	---	---	---	---	---	---	---	---	CT	CT	CTW	CTW	CGTW	64
65	F	---	---	---	---	---	---	---	---	---	---	W	W	EW	EW	ETW	65
66	F	---	---	---	---	---	---	---	---	---	---	---	---	T	T	ST	66
DICE ROLL	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	DICE ROLL

HIT TABLE NUMBER

NOTES: (ADV) COLLISIONS: 2 X Hit Table 12. (No firing allowed).
(ADV) FIXED HEAVY CANNON: 2 X Hit Table 14.
(ADV) FLEXIBLE LIGHT CANNON: 2 X Hit Table 12.
(OP) "ARCHIE" Exact: 3 X Hit Table 10.
HITS: 1 Alt: 2 X Hit Table 10.
2 Alt: 1 X Hit Table 10.

GUN JAMMING TABLES (OP)

INTENDED BURSTS PER GUN	BURSTS BEFORE JAM	DICE ROLL
1	Broken	66
	0	65+
	1	63-64
	No Jam	62 or less
2	Broken	66
	0	64+
	1	62-63
	2	55-61
	No Jam	54 or less
3	Broken	66
	0	62+
	1	55-61
	2	52-54
	3	43-51
	No Jam	42 or less
NORMAL CLEAR GUN JAM		11-16

MODIFIERS:
+1: In Dive Speed; Using Incendiary; In Inverted Bank; Making Advanced Maneuver; or Altitude Level 600+.
-1: Experienced; or Ground or Ship.

FIRE TABLES (OP)

DICE ROLL	FIRE SIDE	FIGHTING FIRES PILOT CONDITION 0 "C" HITS	1, 2 "C" HITS	FIRE DAMAGE PER TURN
11-13	Right	Fire Out	Fire Out	No Damage
14-16	Right	Fire Out	Continues	No Damage
21-32	Right	Continues	Continues	E
33-36	Right	Continues	Continues	S
41-43	Left	Continues	Continues	S
44-53	Left	Continues	Continues	W
54-61	Left	Continues	Continues	C
62-64	Left	Continues	Continues	T
65	Left	Continues	Continues	L
66	Left	Continues	Continues	Explodes
Engines all off for Fire.		One attempt per Slip away or for Dive Speed.		Extra roll per Turn.

TARGET IDENTIFICATION TABLES (OP)

DICE ROLL	TYPE GUN FIRING FIXED AIR	FLEX. AIR	GROUND
11-46	Target	Target	Target
51-56	Target	Target	Nearest
61-63	Target	Nearest	Nearest
64-66	Nearest	Nearest	Nearest

RANGE FINDER CHART

ALT. DIFF.	HEX RANGE 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1-5	1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
6-10	2	2	3	3	4	5	6	7	8	9	10	11	12	13	14	15	16
11-15	3	3	3	4	5	6	7	7	8	9	10	11	12	13	14	15	16
16-20	4	4	4	5	6	6	7	8	9	10	11	12	13	13	14	15	16
21-25	5	5	5	6	6	7	8	8	9	10	11	12	13	14	15	16	17
26-30	6	6	6	7	7	8	8	9	10	11	12	12	13	14	15	16	17
31-35	7	7	7	8	8	9	9	10	11	11	12	13	14	15	16	16	17
36-40	8	8	8	9	9	9	10	11	11	12	13	14	14	15	16	17	18
41-45	9	9	9	10	10	10	11	11	12	13	13	14	15	16	17	17	18
46-50	10	10	10	11	11	11	12	12	13	14	14	15	16	16	17	18	19
51-55	11	11	11	12	12	12	13	13	14	14	15	16	16	17	18	19	19
56-60	12	12	12	13	13	13	14	14	15	15	16	16	17	18	19	19	20
61-65	13	13	13	14	14	14	15	15	16	16	17	17	18	19	19	20	21
66-70	14	14	14	15	15	15	16	16	16	17	18	18	19	19	20	21	21
71-75	15	15	15	16	16	16	17	17	17	18	18	19	20	20	21	22	22
76-80	16	16	16	17	17	17	18	18	18	19	19	20	20	21	22	22	23

BANK AND NOSE ATTITUDE EFFECTS ON GUN PLAY CHART (OP)

STANDARD ARC GUN DIAGRAM	STEEP DIVE NOSE ATTITUDE BANK ATTITUDE UL	UE	UR	PL	PR	IL	IE	IR	SHALLOW DIVE NOSE ATTITUDE BANK ATTITUDE UL	UE	UR	PL	PR	IL	IE	IR	HORIZONTAL NOSE ATTITUDE BANK ATTITUDE UL	UE	UR	PL	PR	IL	IE	IR	SHALLOW CLIMB NOSE ATTITUDE BANK ATTITUDE UL	UE	UR	IL	IE	IR	STEEP CLIMB NOSE ATTITUDE BANK ATTITUDE UL	UE	UR	IL	IE	IR	STANDARD ARC GUN DIAGRAM
12H	10L	12L	2L	D	D	8L	6L	4L	10E	12E	2E	10L	2L	D	D	D	10H	12H	2H	10E	2E	10L	12L	2L	U	U	U	10E	12E	2E	8H	6H	4H	10H	12H	2H	12H
12E	D	D	D	D	D	D	D	D	12L	12L	12L	12L	12L	12L	12L	12L	12E	12E	12E	12E	12E	12E	12E	12E	12H	12H	12H	12H	12H	12H	U	U	U	U	U	U	12E
12L	4L	6L	8L	D	D	2L	12L	10L	D	D	D	2L	10L	2E	12E	10E	2L	12L	10L	2E	10E	2H	12H	10H	2E	12E	10E	U	U	U	2H	12H	10H	4H	6H	8H	12L
2H	12L	2L	D	10L	4L	D	8L	6L	12E	2E	2L	10E	D	10L	D	D	12H	2H	2E	10H	2L	10E	10L	12L	U	U	2H	10H	10E	12E	6H	4H	U	U	10H	12H	2H
2E	2L	D	4L	12L	6L	10L	D	8L	2E	2L	D	12E	D	10E	10L	D	2H	2E	2L	12H	12L	10H	10E	10L	U	2H	2E	U	10H	10E	4H	U	2H	8H	U	10H	2E
2L	D	4L	6L	2L	8L	12L	10L	D	2L	D	D	2E	D	12E	10E	10L	2E	2L	12L	2H	10L	12H	10H	10E	2H	2E	12E	U	U	10H	U	2H	12H	6H	8H	U	2L
4H	12H	2H	U	10H	4H	U	8H	6H	U	U	4H	U	4E	8H	8E	6E	6H	4H	4E	8H	4L	8E	8L	6L	6E	4E	4L	8L	D	D	6L	4L	D	D	10L	12L	4H
4E	2H	U	4H	12H	6H	10H	U	8H	U	4H	4E	U	6E	U	8H	8E	4H	4E	4L	6H	6L	8H	8E	8L	4E	4L	D	8E	8L	D	4L	D	2L	8L	D	10L	4E
4L	U	4H	6H	2H	8H	12H	10H	U	4H	4E	6E	U	8E	U	U	8H	4E	4E	6L	4H	8L	6H	8H	8E	4L	D	D	6E	8E	8L	D	2L	12L	6L	8L	D	4L
6H	10H	12H	2H	U	U	8H	6H	4H	U	U	U	8H	4H	8E	6E	4E	8H	6H	4H	8E	4E	8L	6L	4L	8E	6E	4E	D	D	D	8L	6L	4L	10L	12L	2L	6H
6E	U	U	U	U	U	U	U	U	6H	6H	6H	6H	6H	6H	6H	6H	6E	6E	6E	6E	6E	6E	6E	6E	6L	6L	6L	6L	6L	6L	D	D	D	D	D	D	6E
6L	4H	6H	8H	U	U	2H	12H	10H	4E	6L	8L	4H	8H	U	U	U	4L	6L	8L	4E	8E	4H	6H	8H	D	D	D	4E	6E	8E	2L	12L	10L	4L	6L	8L	6L
8H	U	10H	12H	8H	2H	6H	4H	U	8H	U	U	8E	U	6E	4E	4H	8E	8H	6H	8L	4H	6L	4L	4E	8L	8E	6E	D	D	4L	D	8L	6L	12L	2L	D	8H
8E	8H	U	10H	6H	12H	4H	U	2H	8E	8H	U	6E	U	4E	4H	U	8L	8E	8H	6L	6H	4L	4E	4H	D	8L	8E	D	4L	4E	10L	D	8L	2L	D	4L	8E
8L	6H	8H	U	4H	10H	U	2H	12H	6E	8E	8H	4E	U	4H	U	U	6L	8L	8E	4L	8H	4E	4H	6H	D	D	8L	4L	4E	6E	12L	10L	D	D	4L	6L	8L
10H	D	10L	12L	8L	2L	6L	4L	D	10L	10E	12E	D	2E	D	D	2L	10E	10H	12H	10L	2H	12L	2L	2E	10H	U	U	12E	2E	2H	U	8H	6H	12H	2H	U	10H
10E	8L	D	10L	6L	12L	4L	D	2L	D	10L	10E	D	12E	D	2L	2E	10L	10E	10H	12L	12H	2L	2E	2H	10E	10H	U	2E	2H	U	10H	U	8H	2H	U	4H	10E
10L	6L	8L	D	4L	10L	D	2L	12L	D	D	10L	D	10E	2L	2E	12E	12L	10L	10E	2L	10H	2E	2H	12H	12E	10E	10H	2H	U	U	12H	10H	U	U	4H	6H	10L
U	12E	12E	12E	12E	12E	12E	12E	12E	12H	12H	12H	12H	12H	12H	12H	12H	8,10H	U	2,4H	8,10E	2,4E	8,10L	D	2,4L	6H	6H	6H	6H	6H	6H	6E	6E	6E	6E	6E	6E	U
D	6E	6E	6E	6E	6E	6E	6E	6E	6L	6L	6L	6L	6L	6L	6L	6L	2,4L	D	8,10L	2,4E	8,10E	2,4H	U	8,10H	12L	12L	12L	12L	12L	12L	12E	12E	12E	12E	12E	12E	D

D: Down. E: Level. H: High. L: Low. U: Up. Numbers refer to clock positions.

WINGS GAME CARD

SIGHTING MODIFIERS (OP)

Size Modifier: On target's Data Card.
Looking into the Sun: -3
Visibility Conditions: 0 to -3
Distracted: -2
Sighting a Ground unit: -1
In Advanced or Spin Maneuver: -3
Per Crew Eliminated: -2/each
Inexperienced: -2
Experienced: +2

RANGE MODIFIERS

SIGHTING MODIFIERS	ACTUAL RANGE
+1	1-50
0	51-100
-1	101-150
-2	151+

FORMATION MODIFIERS

NUMBER OF PLANES IN THE FORMATION	MODIFIER
6-9	+1
10-19	+2
20+	+3

VICTORY POINTS CHART

PLANES: Planes have four values listed:

1st: Award if Plane and all Crew are destroyed.

2nd: Award if Plane is destroyed, but at least some Crew survive. (a)

3rd: Award if Plane not destroyed, but at least one Crew is eliminated or has taken two "C" hits. (b)

4th: Award if Plane is damaged but not destroyed, and no Crew have been destroyed or taken two "C" hits.

GROUND GUNS DESTROYED:

- **Magazine Machinegun:** 5
- **Belt Machinegun:** 6
- **Automatic Cannon:** 6
- **Heavy Machinegun:** 10
- **Heavy Guns:** 10

INFANTRY DESTROYED: 3

TRUCK, WAGON, OR LIMBER DESTROYED: 5

TANK DESTROYED: 5

BALLOON DESTROYED: 20 (a)

SHIP DESTROYED: Listed.

ZEPPELIN DESTROYED: Listed.

(a) Subtract 3 Points for each surviving Crewman.

(b) Add 3 Points for each eliminated Crewman.

CRASH LANDING TABLES (ADV)

DICE ROLL	TOTAL "C" & "T" HITS 0,1	2	3	4	5
11-16	OK	OK	OK	OK	OK
21-26	OK	OK	OK	OK	S
31-36	OK	OK	S	S	C
41-43	OK	S	C	C	WRK
44-46	S	C	C	WRK	WRK
51-53	C	WRK	WRK	WRK	WRK
54+	WRK	WRK	WRK	WRK	WRK

MODIFIERS: +1: Each Speed Factor over "3"; Non-Pilot flying; On Fire; wrong environment; or not Upright Bank Attitude.

OK: Successful Landing.

S: Structure hit.

C: Crew hit.

WRK: Plane & Crew destroyed.

IMPULSE CHARTS (DUEL GAME)

POSSIBLE ACTIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	POSSIBLE ACTIONS
	1	1 2	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3 4 5 6	1 2 3 4 5 6 7	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12 13	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	2
3	3	1 2	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	3
4	4	2 2	1 2 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	4
5	5	2 3	2 1 2	1 1 2 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	5
6	6	3 3	2 2 2	1 2 1 2	1 1 2 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	6
7	7	3 4	2 3 2	2 1 2 2	1 2 1 2	1 1 1 2	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	7
8	8	4 4	3 2 3	2 2 2 2	2 1 2 1	2 1 2 1	1 1 1 2	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	8
9	9	4 5	3 3 3	2 2 3 2	2 2 1 2	2 1 1 2	1 2 1 1	1 1 1 2	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	9
10	10	5 5	3 4 3	2 3 2 3	2 2 2 2	2 1 2 2	1 2 1 2	1 1 2 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	10
11	11	5 6	4 3 4	3 2 3 3	2 2 3 2	2 2 1 2	2 2 1 2	1 2 1 1	2 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	11
12	12	6 6	4 4 4	3 3 3 3	2 3 2 3	2 2 2 2	2 2 2 2	1 2 1 2	1 2 1 1	2 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	12
13	13	6 7	4 5 4	3 3 4 3	3 2 3 2	3 2 2 3	2 2 2 2	1 2 2 2	1 2 1 2	1 2 1 1	2 1 1 1	1 1 1 1	1 1 1 1	13
14	14	7 7	5 4 5	3 4 3 4	3 3 2 3	3 2 2 3	2 2 2 2	2 1 2 2	2 1 2 1	2 1 2 1	2 1 1 1	2 1 1 1	1 1 1 1	14
15	15	7 8	5 5 5	4 3 4 4	3 3 3 3	3 2 2 3	2 3 2 2	2 2 2 1	2 2 2 2	2 1 2 1	2 1 2 1	2 1 1 1	2 1 1 1	15
16	16	8 8	5 6 5	4 4 4 4	3 3 4 3	3 2 3 3	2 3 2 2	2 3 2 2	2 2 2 2	2 2 1 2	2 1 2 1	2 1 2 1	2 1 2 1	16
17	17	8 9	6 5 6	4 4 5 4	3 4 3 4	3 3 2 3	3 3 2 3	2 2 2 3	2 2 2 2	2 2 2 1	2 2 2 2	2 1 2 1	2 1 2 1	17
18	18	9 9	6 6 6	4 5 4 5	4 3 4 3	4 3 3 3	3 3 3 3	2 3 2 3	2 3 2 3	2 2 2 2	2 2 2 2	2 1 2 1	2 1 2 1	18
19	19	9 10	6 7 6	5 4 5 5	4 4 3 4	4 3 3 4	3 3 3 3	2 3 2 3	2 3 2 3	2 2 2 2	2 2 2 2	2 1 2 1	2 1 2 1	19
20	20	10 10	7 6 7	5 5 5 5	4 4 4 4	4 3 3 4	3 3 3 3	2 3 2 3	2 3 2 3	2 2 3 2	2 2 2 2	2 2 1 2	2 1 2 1	20
21	21	10 11	7 7 7	5 5 6 5	4 4 5 4	4 4 3 3	4 3 4 3	3 3 3 3	3 3 3 3	2 3 2 3	2 3 2 2	2 2 2 2	2 1 2 1	21
22	22	11 11	7 8 7	5 6 5 6	4 5 4 5	4 4 3 4	4 3 4 3	3 3 4 3	3 3 3 3	2 3 3 3	2 3 3 2	2 2 3 2	2 1 2 1	22
23	23	11 12	8 7 8	6 5 6 6	5 4 5 4	5 4 4 3	4 4 4 3	4 3 3 3	4 3 3 3	2 3 3 3	3 3 3 2	2 3 2 2	2 1 2 1	23
	1	1 2	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3 4 5 6	1 2 3 4 5 6 7	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12 13	

SOLITAIRE MOVEMENT TABLES (OP)

DICE ROLL	SHIPS	GROUND	BALLOON DESCENT	BALLOON IN. ALT.	ZEPPELIN MOVE	ZEPPELIN ALT. CHG.
11-16	-TL	-TL	D3	50	--TL	C3
21-23	-TL	TL-	D2	45	---TL	C2
24-33	-TL	-TR	D2	40	--TR	C1
34-36	-TR	TR-	D1	35	---TR	D1
41-56	-TR	1	D1	25	11	D1
61-63	11	1	D1	20	111	D2
64-66	1	0	0	15	1111	0

NOTES: Balloon or Zeppelin Explosion: Hit Table 6 for all within an Actual Range of "2".

Ships: 1 turn/3 Turns. **Infantry:** 1 hex/2 Turns.

Vehicles: Can move and turn every Turn.

Zeppelin: 1 turn/5 Turns.

TAKE OFF TABLES (OP)

DICE ROLL	PLANE READINESS INLINE READY	INLINE UNREADY	ROTARY READY	ROTARY UNREADY	INITIAL READINESS
11-13	Start	Start	Start	Start	Started
14-23	Start	No	Start	Start	Ready
24-26	No	No	Start	No	Ready
31-33	No	No	Start	No	Unready
34-66	No	No	No	No	Unready

Apply only one Power Factor/Turn until the plane Takes Off.

EXCEEDING LIMITS TABLES (OP)

DICE ROLL	EXCESS DIVE SPEED +1	+2	+3	+4	STRUCTURAL WEAKNESSES (*)	½S	½W	1T	2T
11-16	NE	NE	W	D	NE	NE	NE	NE	NE
21-26	NE	W	WW	D	NE	NE	NE	NE	NE
31-36	W	WW	WWW	D	NE	NE	W	NE	D
41-46	WW	WWW	D	D	W	S	WW	NE	D
51-56	WWW	D	D	D	WW	SS	WWW	T	D
61+	D	D	D	D	D	D	D	D	D

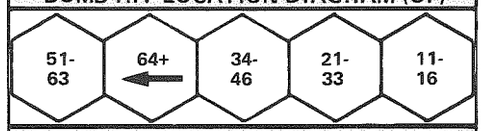
NE: No effects. **S:** Structure hit. **W:** Wing hit. **T:** Control hit.
D: Plane destroyed.

HITS ON NON-PLANE TARGETS CHART (OP)

TYPE OF TARGET	HITS TO DESTROY	HITS THAT COUNT: HITS WITH STD. AMMO	HITS WITH INCENDIARY	HITS WITH CANNON	HITS WITH BOMBS	HITS IF ENTRENCHED
Balloon	2	C*FG*L	C*FG*LS	C*FG*LS	————	————
Building	1	————	————	FL	FSW	————
Guns	1	C*G	C*G	C*G	C*GS	G
Hanger	1	————	————	FL	FSW	————
Infantry	1	CG	CG	CG	CGS	G
Land. Field	1/hex	————	————	C	SW	————
Limber	1	CEFL	CEFLS	CEFLS	CEFLSW	————
Railline	1/hex	————	————	C	SW	————
Ship	Listed	C*G*	C*G*	C*G*S	C*G*SW	————
Tank	1	FL	EFL	EFLS	EFLST	————
Trench	1	————	————	————	E	————
Truck	1	CEF	CEFL	CEFL	CEFLS	————
Wagon	1	CES	CES	CELS	CEFLS	————
Zeppelin	2	C*E*FG*L	C*E*FG*LS	C*E*FG*LS	————	————

*: Counts as Crew (C), Engine (E), or Gun (G) hits, if present, but does not count towards destroying the target. All Torpedo hits count on Ships.

BOMB HIT LOCATION DIAGRAM (OP)



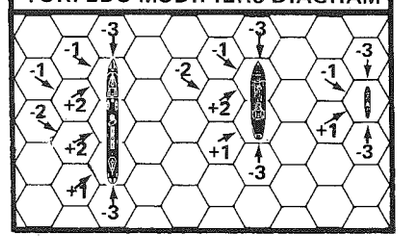
HIT LOCATION DICE ROLL MODIFIERS

Poor Visibility or Obscured: -1
Experienced: +1
Inexperienced: -1

ALTITUDE MODIFIERS

PLANE ALTITUDE ABOVE TARGET	MODIFIER
1-4	+3
5-8	+2
9-20	+1
21-40	0
41-120	-1
121-400	-2
401+	-3

TORPEDO MODIFIERS DIAGRAM



BAILING OUT TABLES (OP)

DICE ROLL	CREW HITS 0	1	2
11-16	B/O	B/O	B/O
21-43	B/O	B/O	PF
44-53	B/O	PF	PF
54+	PF	PF	PF

MODIFIER: Add "1" to the colored die if plane is on fire. Use for balloonists and Germans (from Feb. 1918) only.

B/O: Bail Out

PF: Parachute Fails

MASS GAME TABLES

GUNFIRE TABLES

MODIFIED HIT TABLE NUMBER	ROLL TO HIT
1	1
2	1-2
3	1-3
4	1-4
5	1-5
6	1-6

MODIFIERS:
One hex Rear: +1
Into Sun: -1.
Ace: +1.

COLLISION TABLE

TYPE	DICE
Friend	11
Foe	11-12
Cloud	11-16

BOMB EFFECTS CHART (OP)

BOMB SIZE	EFFECT
T	(1 Die + Modifier) X 4
G	Hit Table 1
1	Hit Table 3
2	Hit Table 9
3	2 X Hit Table 9
4	2 X Hit Table 15
5	3 X Hit Table 15
6	6 X Hit Table 15
7	8 X Hit Table 15

ROCKET FIRING TABLE (OP)

(Maximum Range = 4)

MODIFIED DICE ROLL	RESULTS
11-64	Miss
65+	Hit

MODIFIERS: +1 for Range of "1" or "2", or for Experienced Pilot.

WINGS COMMAND SHEET

NAME: ID. NO.

W S L T
C 1 2 3 4 5 6 7 8
E E E E
G
A

TURN NUMBER	IN. SPEED	IN. ALTITUDE	IN. BANK	LOAD: / INITIAL HEX: / INITIAL DIRECTION: — IMPULSE COLUMNS 1	2	3	4	5	6	7	8	9	10	SP. CHG.	ALT. CHG.
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

NAME: ID. NO.

W S L T
C 1 2 3 4 5 6 7 8
E E E E
G
A

IN. SPEED	IN. ALTITUDE	IN. BANK	LOAD: / INITIAL HEX: / INITIAL DIRECTION: — IMPULSE COLUMNS 1	2	3	4	5	6	7	8	9	10	SP. CHG.	ALT. CHG.

NAME: ID. NO.

W S L T
C 1 2 3 4 5 6 7 8
E E E E
G
A

IN. SPEED	IN. ALTITUDE	IN. BANK	LOAD: / INITIAL HEX: / INITIAL DIRECTION: — IMPULSE COLUMNS 1	2	3	4	5	6	7	8	9	10	SP. CHG.	ALT. CHG.	TURN NUMBER
															1
															2
															3
															4
															5
															6
															7
															8
															9
															10
															11
															12
															13
															14
															15
															16
															17
															18
															19
															20

TYPE: ID. NO.
C 1 2 3
G A B C
A

TYPE: ID. NO.
C 1 2 3
G A B C
A

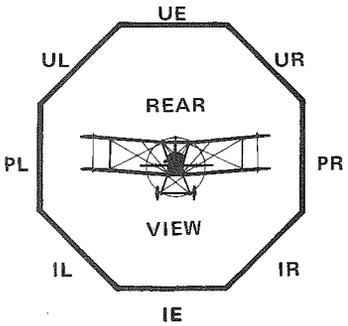
TYPE: ID. NO.
C 1 2 3
G A B C
A

TYPE: ID. NO.
C 1 2 3
G A B C
A

TYPE: ID. NO.
C 1 2 3
G A B C
A

TYPE ID. NO.
C 1 2 3
G A B C
A

BANK ATTITUDE NOTATIONS DIAGRAM



Normal Climb Rate is reduced by "1" if not in UE Bank.
No Climb Allowed if in Perpendicular Bank for entire Turn.

IMPULSE COLUMN NOTATIONS

Bank Left:	BL	(A) Barrel Roll Left:	CL	(OP) Clear Gun Jam:	J ___
Bank Right:	BR	(A) Barrel Roll Right:	CR	(OP) Drop Bomb:	DB ___
Slip Left:	SL	(A) Half-Loop:	HP	(OP) Drop Grenade:	DG ___
Slip Right:	SR	(A) Half-Roll Left:	HL	(OP) Drop Smoke:	DS ___
Spin:	SP	(A) Half-Roll Right:	HR	(OP) Drop Torpedo:	DT
Straight Ahead:	1	(A) Immelmann Left:	IL	(OP) Fire Rockets:	FR ___
Turn Left:	TL	(A) Immelmann Right:	IR	(OP) Jettison Guns:	JTG
Turn Right:	TR	(A) Skid Left:	KL	(OP) Jettison Load:	JTL
Making Maneuver:	—	(A) Skid Right:	KR	(OP) Photograph:	PH
(D) Col. not used:	X	(A) Snap Maneuver (extra Speed Loss):	+	(OP) Reload Gun:	G ___

SPEED CHANGE COLUMN NOTATIONS

Brake Factor: B
Power Factor: P
(A) Engine Off: Circle Brake notation.

ALTITUDE CHANGE COLUMN NOTATIONS

Climb: C
Dive: D
(D) Steep Climb or Dive: Circle notation.

MISCELLANEOUS NOTATIONS

(OP) Broken Gun: Circle in Hit Record.
(OP) Incendiary: Mark "I" in "Ammo."
(OP) Jammed Gun: "J" in Hit Record.
(OP) Smoke Bombs: "2S" in "Load".
(OP) Fire Starts: Mark "F" on Turn Line.

Zoom Climb Rate Fractions

1/3 = 1/2 (400 & under) =
= 1/1 (401+)
1/2 = 1/1
1/1 = 2/1

12
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-4
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 7

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	4	2	–	–	–	–	–

SPECIAL RULES (ADV & OP): Can take off and land only from water. Variant does not carry Crew 1. When Camera or Bombs are carried, no Guns are carried, and Crew 1 is not carried. ⓐ Through late 1916.

SIGHTING VALUES (OP): 12 / 33 / 32 / 33 / U: 35 D: 34 / 44 / 43 / 44 / 6
CREW AND GUN POSITIONS: A,D 1 2

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 3 2 ③ 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3PW E – E – E –

VARIANTS (ADV): Fighter Version. (Points: ⑲ 22-11-6-3).

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)			3		
RANGE	10			10		
OPER.	Crew 1			Crew 2		
AMMO (OP)	6 x 3 ⓐ or 4 x 6			28		

STRATEGIC GAME INFORMATION: COMBAT 4-1 RANGE 9; CLIMB 170-130; GLIDE 130-170-210
MASS GAME INFORMATION: SPEEDS 2-4-5; CLIMB 1 DIVE 2; CEILING 5; MANEUVER NO. 6; FIRE 2-1-1 / ––; HITS 2

11
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): 10

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	8	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Some planes carried Guns A and C together (Points: ㉘). All two-gun models use the Climb and Zoom numbers in parenthesis.

SIGHTING VALUES (OP): 12 / 45 / 41 / 42 / U: 41 D: 44 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,D C,F 1

PLANE TARGET CHARACTERISTICS CHART
W 6 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): Two guns. (Points: ㉘)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	2	OR	[3]	2-2	OR	3-3
RANGE	10		8	10		8
OPER.	Crew 1		Crew 1	Crew 1		Crew 1
AMMO (OP)	28		3 x 6	14-14		6 x 3

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 6; CLIMB 540(430)-390(290); GLIDE 290-390-490
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 2 DIVE 4; CEILING 7; MANEUVER NO. 8; FIRE 2-2-1 / ––––; HITS 2

8
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): A: 10 B or E: 9

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	8	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Flies without Crew 2 or Guns B or E if carrying Rockets.

SIGHTING VALUES (OP): 12 / 43 / 33 / 42 / U: 35 D: 41 / 35 / 34 / 43 / 6
CREW AND GUN POSITIONS: D A 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 6 S 5 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): Synchornized gun (mid 1916) (Points: ㉘)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		2	(3)	
RANGE	8	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	6 x 3			14	4 x 3	

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 9; CLIMB 310-130; GLIDE 210-280-350
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 4; CEILING 6; MANEUVER NO. 6; FIRE 2-2-1 / 2-1-1; HITS 2

6
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): –
RELOAD TIME (OP): 10

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	8	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Gun must be removed to carry Rockets. Wing failure through mid 1915. ⓐ Through early 1916.

SIGHTING VALUES (OP): 12 / 45 / 41 / 42 / U: 41 D: 44 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,D 1

PLANE TARGET CHARACTERISTICS CHART
W 5 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): Foster mount (mid 1916). (POINTS: ㉔)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3			[3]		
RANGE	8			8		
OPER.	Crew 1			Crew 1		
AMMO (OP)	3x3 ⓐ or 2 x 6			2 x 6		

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 8; CLIMB 360-220; GLIDE 320-430-540
MASS GAME INFORMATION: SPEEDS 2-4-6; CLIMB 1 DIVE 3; CEILING 6; MANEUVER NO. 8; FIRE 2-2-1 / –; HITS 2

4
SIZE MODIFIER: +1 STEADY SHOT(OP): 1-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): A: 6 D: 8

LOAD(OP) 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	6	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): May not fly Inverted. Variant cannot carry Load, and flies as if Loaded.

SIGHTING VALUES (OP): 12 / 33 / 32 / 33 / U: 35 D: 34 / 41 / 53 / 54 / 6
CREW AND GUN POSITIONS: D 1 2 A

PLANE TARGET CHARACTERISTICS CHART
W 5 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3P E – E – E –

VARIANTS (ADV): Voisin 5 LBS. (Points: ⑭)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)			(CN)		
RANGE	10			5(10)		
OPER.	Crew 2			Crew 2		
AMMO (OP)	6 x 3			6 x 1		

STRATEGIC GAME INFORMATION: COMBAT 4-1 RANGE 11; CLIMB 160-90; GLIDE 130-170-210
MASS GAME INFORMATION: SPEEDS 2-4-5; CLIMB 1 DIVE 2; CEILING 4; MANEUVER NO. 2; FIRE 2-1-1 / ––––; HITS 2

21
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): 11

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	20	–	–	–	8	4	2	–	–	–	–

SPECIAL RULES (ADV & OP): Variant must be used if camera is carried.

SIGHTING VALUES (OP): 12 / 45 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 43 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 7 S 7 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Armament for photo missions. (Points: ㉘)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)-(3)		3	(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	34	8 x 6		28	4 x 6	

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 9; CLIMB 330-170; GLIDE 90-120-150
MASS GAME INFORMATION: SPEEDS 3-5-8; CLIMB 1 DIVE 3; CEILING 8; MANEUVER NO.; FIRE 2-2-1 / 4-3-2; HITS 2

19
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): E: 15

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant may only carry "G" Bombs. Variant uses Climb and Zoom numbers in parenthesis. Gun C must be armed with Incendiary ammunition.

SIGHTING VALUES (OP): 12 / 52 / 41 / 42 / U: 41 D: 43 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,C,D,E 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 7 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Late model Spad 12 Ca. 1 (early 1918)(Points: ㉚ 24-12-6-3)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3	OR	[3]	3	(CN)	
RANGE	10		8	10	5(10)	
OPER.	Crew 1		Crew 1	Crew 1	Crew 1	
AMMO (OP)	28-28		28	14	6 x 1	

STRATEGIC GAME INFORMATION: COMBAT 7-1 RANGE 6; CLIMB 700(640)-320(260); GLIDE 230-300-370
MASS GAME INFORMATION: SPEEDS 3-7-9; CLIMB 3 DIVE 6; CEILING 9; MANEUVER NO. 6; FIRE 4-3-3 / ––––; HITS 2

18
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	8	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant uses the Climb and Zoom numbers in parenthesis. C Gun must be armed with Incendiary ammunition.

SIGHTING VALUES (OP): 12 / 45 / 36 / 44 / U: 41 D: 44 / 43 / 42 / 52 / 6
CREW AND GUN POSITIONS: A,C,D 1

PLANE TARGET CHARACTERISTICS CHART
W 6 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): Two guns. (Points: ㉙)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	OR	[3]	3-3		
RANGE	10		8	10		
OPER.	Crew 1		Crew 1	Crew 1		
AMMO (OP)	28		14	22-22		

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 8; CLIMB 620(460)-470(160); GLIDE 170-230-290
MASS GAME INFORMATION: SPEEDS 3-5-8; CLIMB 2 DIVE 5; CEILING 8; MANEUVER NO. 7; FIRE 2-2-1 / ––––; HITS 2

16
SIZE MODIFIER: +2 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn.
RELOAD TIME (OP): 11

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	–	20	–	–	–	32	16	4	3	–	–	–

SPECIAL RULES (ADV & OP): Had dual controls. Crew 2 is not carried in the Variant. If Gun C is carried, no Bombs can be carried. Variant uses Climb numbers in parenthesis: ⓐ Variant only. Gun C version Points: ㊵. Standard points for Guns A and B only.

SIGHTING VALUES (OP): 12 / 43 / 33 / 46 / U: 35 D: 35 / 35 / 34 / 43 / 6
CREW AND GUN POSITIONS: A,D 1 2 B C

PLANE TARGET CHARACTERISTICS CHART
W 8 S 9 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Br. 14B.1 (late 1917) (Points: ㉖ 27-13-7-3)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)-(3)	(3)	3		
RANGE	10	10	8	10		
OPER.	Crew 1	Crew 2	Crew 2	Crew 1		
AMMO (OP)	14	6 x 6		17		

STRATEGIC GAME INFORMATION: COMBAT 6-2 RANGE 11-18 ⓐ; CLIMB 460(490)-380(400); GLIDE 90-120-150
MASS GAME INFORMATION: SPEEDS 2-5-7; CLIMB 2 DIVE 4; CEILING 8; MANEUVER NO. 3; FIRE 2-2-1 / 4-3-2; HITS 3

13
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): 12

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	8	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant may not carry Rockets or Bombs. Variant uses Climb and Zoom numbers in parenthesis.

SIGHTING VALUES (OP): 12 / 52 / 41 / 42 / U: 41 D: 43 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A, D E 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 7 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Additional gun. (Points: ㉛)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3			3	[3]	
RANGE	10			10	8	
OPER.	Crew 1			Crew 1	Crew 1	
AMMO (OP)	28			22	2 x 6	

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 7; CLIMB 480(220)-270(80); GLIDE 240-320-400
MASS GAME INFORMATION: SPEEDS 3-6-9; CLIMB 3 DIVE 6; CEILING 8; MANEUVER NO. 7; FIRE 2-2-1 / ––––; HITS 2

30
SIZE MODIFIER: +2 STEADY SHOT(OP): 1-5
FLEXIBLE GUN TURNING (ADV): 1/Turn.
RELOAD TIME (OP): A,B: 7. D:8. F:9.

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	8	6	3	1	–	–	–

SPECIAL RULES (ADV & OP): Crew 1 not used on Home Defense Variant. F Gun Jams cannot be cleared, Crew sits side-by-side in F Gun version, Crew 2 to the left. F Gun Variant carries only 4 x"1" Bombs. ⓐ Through 1916. Use Climb numbers in parenthesis for Home Defense version.

SIGHTING VALUES (OP): 12 / 33 / 32 / 33 / U: 35 D: 34 / 41 / 53 / 54 / 6
CREW AND GUN POSITIONS: A,D,F 1 2 B

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 3 2 ③ 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3P E – E – E –

VARIANTS (ADV): Home Defense (D Gun) or Ground Attack (F Gun) versions. POINTS: D: ㉓ 24-12-6-3. F: ⑱.

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)	(3)		3-3	OR	(CN)
RANGE	10	10		10		4 (8)
OPER.	Crew 1	Crew 1		Crew 2		Crew 1
AMMO (OP)	8 x 3 ⓐ or 6 x 6			8 x 3 ⓐ or 6 x 6		12

STRATEGIC GAME INFORMATION: COMBAT 4-2 RANGE 9; CLIMB 220(310) - 120(160); GLIDE 110-150-190
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 2; CEILING 5; MANEUVER NO. 3; FIRE 2-1-1 / 2-1-1; HITS 2

28
SIZE MODIFIER: +1 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): 9

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	10	–	–	–	6	2	–	–	–	–	–

SPECIAL RULES (ADV & OP): Crew 2 is not carried on Variant. Use Climb numbers in parenthesis for Variant. Variant Ceiling is "750". Variant may carry 12 x "1", 4 x "2", or 4 x "3" Bombs. ⓐ Through 1916.

SIGHTING VALUES (OP): 12 / 46 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: A,D 1 F 2 B

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): French Sopwith IB.1 (Points: 1 Gun: ㉒ 21-10-5-3 / 2 Guns: ㉖ 21-10-5-3)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	2	(3)		2	AND/ OR	[3]
RANGE	10	10		10		8
OPER.	Crew 1	Crew 2		Crew 1		Crew 1
AMMO (OP)	14	4 x 3 ⓐ or 3 x 6		14		6

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 13; CLIMB 310(360)-180(210); GLIDE 110-140-170
MASS GAME INFORMATION: SPEEDS 2-5-7; CLIMB 1 DIVE 4; CEILING 5; MANEUVER NO. 5; FIRE 2-2-1 / 2-1-1; HITS 2

27
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): 9

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): ⓐ Through mid 1916.

SIGHTING VALUES (OP): 12 / 35 / 34 / 35 / U: 41 D: 36 / 53 / 55 / 53 / 6
CREW AND GUN POSITIONS: A,C,D 1

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3P E – E – E –

VARIANTS (ADV): Early gun mount. (Points: ㉔)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	[3]	OR	3	(3)		
RANGE	8		10	5		
OPER.	Crew 1		Crew 1	Crew 1		
AMMO (OP)	4 x 3 ⓐ or 3 x 6		14	4 x 3		

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 7; CLIMB 330-170; GLIDE 210-280-350
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 3; CEILING 6; MANEUVER NO. 8; FIRE 2-2-1 / ––––; HITS 2

24
SIZE MODIFIER: +3 STEADY SHOT(OP): ––––
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 7

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	1	6	4	4	1	1	–	–

SPECIAL RULES (ADV & OP): Can take off and land only from water. If Torpedo carried, Crew 2 and Gun are not carried. Ceiling with Torpedo is "32". Climb numbers in parenthesis apply while Torpedo is carried. a Through 1916. ⓑ Range carrying Torpedo. May not fly Inverted.

SIGHTING VALUES (OP): 12 / 46 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: 1 2 A,D

PLANE TARGET CHARACTERISTICS CHART
W 7 S 8 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Later gun mount (mid 1916) (Points: ⑳)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)			(3)		
RANGE	10			10		
OPER.	Crew 2			Crew 2		
AMMO (OP)	6 x 3 ⓐ or 4 x 6			6 x 3 ⓐ or 4 x 6		

STRATEGIC GAME INFORMATION: COMBAT 3-2 RANGE 14-3ⓑ; CLIMB 210-140(32); GLIDE 140-180-220
MASS GAME INFORMATION: SPEEDS 2-4-5; CLIMB 1 DIVE 2; CEILING 3; MANEUVER NO. 2; FIRE –––– / 2-1-1; HITS 2

23
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): 15

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant can take off and land only from water. Gun C must be armed with Incendiary ammunition. Climb and Zoom numbers in parenthesis apply to Variant.

SIGHTING VALUES (OP): 12 / 52 / 41 / 42 / U: 41 D: 43 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,C,D,E 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 7 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Spad 14 Seaplane (40 built-early 1918). (Points: ㉖ 24-12-6-3)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3	OR	[3]	3	(CN)	
RANGE	10		8	10	5(10)	
OPER.	Crew 1		Crew 1	Crew 1	Crew 1	
AMMO (OP)	28-28		22	28	6 x 1	

STRATEGIC GAME INFORMATION: COMBAT 7-1 RANGE 7; CLIMB 710(620)-360(230); GLIDE 230-300-370
MASS GAME INFORMATION: SPEEDS 3-7-9; CLIMB 3 DIVE 6; CEILING 9; MANEUVER NO. 6; FIRE 4-3-3 / ––––; HITS 2

41
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-6
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): 12

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	4	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Guns A and D require "11-15" to clear a Jam. Variant carries one-half the Bomb Load, has a Ceiling of "750", and uses the Climb and Zoom numbers in parenthesis.

SIGHTING VALUES (OP): 12 / 52 / 36 / 44 / U: 41 D: 46 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,D B,E 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Extra gun version (few used) (Points: ㉟)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	[3]		3	3-3	
RANGE	10	8		10	8	
OPER.	Crew 1	Crew 1		Crew 1	Crew 1	
AMMO (OP)	22	4 x 6		14	4 x 6	

STRATEGIC GAME INFORMATION: COMBAT 7-1 RANGE 9; CLIMB 500(460)-300(270); GLIDE 150-200-250
MASS GAME INFORMATION: SPEEDS 3-6-9; CLIMB 2 DIVE 6; CEILING 9; MANEUVER NO. 7; FIRE 4-3-3 / ––––; HITS 2

38
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): 11

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	8	6	4	2	–	–	–

SPECIAL RULES (ADV & OP): Variant carries one-half Bomb Load. Had Dual Controls. ⓐ Bomb Load cut in half for Long Range Missions -- also range for Variant.

SIGHTING VALUES (OP): 12 / 46 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 43 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Westland - built for R.N.A.S. (Points: ㉞)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		3-3	(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	14	4 x 6		14-14	4 x 6	

STRATEGIC GAME INFORMATION: COMBAT 5-3 RANGE 11-20 ⓐ; CLIMB 330-200; GLIDE 90-120-150
MASS GAME INFORMATION: SPEEDS 3-6-7; CLIMB 1 DIVE 3; CEILING 8; MANEUVER NO. 2; FIRE 2-2-1 / 2-1-1; HITS 2

36
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-6
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 9

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	10	–	60	–	10	4	2	–	–	–	–

SPECIAL RULES (ADV & OP): Wing failures through early 1917.

SIGHTING VALUES (OP): 12 / 46 / 31 / 44 / U: 35 D: 45 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 5 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Early production (through early 1917) (Points: ㉕)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		3	(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	14	4 x 6		14	4 x 6	

STRATEGIC GAME INFORMATION: COMBAT 4-2 RANGE 13; CLIMB 270-170; GLIDE 110-140-170
MASS GAME INFORMATION: SPEEDS 3-5-6; CLIMB 1 DIVE 2; CEILING 6; MANEUVER NO. 1; FIRE 2-2-1 / 2-1-1; HITS 2

35
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): 10

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	8	–	–	4	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant uses the Climb and Zoom numbers in parenthesis.

SIGHTING VALUES (OP): 12 / 45 / 36 / 44 / U: 41 D: 52 / 43 / 42 / 52 / 6
CREW AND GUN POSITIONS: A,D C,E 1

PLANE TARGET CHARACTERISTICS CHART
W 5 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): Carries two Guns (few used) (Points: ㉘)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	2	OR	[3]	2	3	
RANGE	10		8	10	8	
OPER.	Crew 1		Crew 1	Crew 1	Crew 1	
AMMO (OP)	17		3 x 3	12	3 x 3	

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 9; CLIMB 390(320)-270(130); GLIDE 170-230-290
MASS GAME INFORMATION: SPEEDS 2-5-7; CLIMB 1 DIVE 5; CEILING 8; MANEUVER NO. 9; FIRE 2-2-1 / ––––; HITS 2

32
SIZE MODIFIER: +1 STEADY SHOT(OP): 1-6
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): A: 7 C,D,F: 8

LOAD(OP) 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	10	–	–	8	2	2	–	–	–	–

SPECIAL RULES (ADV & OP): Cut Bomb Load in half on Variants. Crew 1 and Guns are not carried if Bombs are carried. Crew 1 is not carried on the Variants. Some carried both Guns A and C (Points: ⑲). Use Climb numbers in parenthesis for planes carrying both Guns A and C.

SIGHTING VALUES (OP): 12 / 46 / 31 / 44 / U: 35 D: 45 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: 1 2 C,D,F A

PLANE TARGET CHARACTERISTICS CHART
W 4 S 5 L 2 T 3
CREW 1 3 2 ③ 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Home Defense Version. (Points: D: ⑯ F: ⑳)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)	and/ OR	3	3	OR	3-3
RANGE	10		8	8		8
OPER.	Crew 1		Crew 2	Crew 2		Crew 2
AMMO (OP)	3 x 6		3 x 6	4 x 6		6 x 3

STRATEGIC GAME INFORMATION: COMBAT 3-1 RANGE 12; CLIMB 220(150)-80(70); GLIDE 130-170-210
MASS GAME INFORMATION: SPEEDS 2-4-5; CLIMB 1 DIVE 2; CEILING 5; MANEUVER NO. 3; FIRE 2-1-1 / ––––; HITS 2

50
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 11 Turn
RELOAD TIME (OP): 12

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	10	–	–	–	4	2	1	–	–	–	–

SPECIAL RULES (ADV & OP): Use Climb and Zoom numbers in parenthesis for the Variant and for 1 C Gun. Use Loaded Modifiers for 2 C Guns, but add Roll modifier in parenthesis. Double Loaded modifiers for 2 C Guns plus Bomb Load. E and F Gun Jams cannot be cleared.

SIGHTING VALUES (OP): 12 / 52 / 35 / 35 / U: 41 D: 46 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,D C 1 E,F

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Underwing guns. All Guns may be fired together. (POINTS: ㊱ (E = Left Wing, F = Right Wing).

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3	AND, SOME ALSO CARRIED	(3)-(3)	3-3	3	3
RANGE	10		5	10	8	8
OPER.	Crew 1		Crew 1	Crew 1	Crew 1	Crew 1
AMMO (OP)	28-28		6 x 3	28-28	6	6

STRATEGIC GAME INFORMATION: COMBAT 7-1 RANGE 5; CLIMB 480(410) - 340(280); GLIDE 160-210-260
MASS GAME INFORMATION: SPEEDS 3-6-8; CLIMB 2 DIVE 6; CEILING 9; MANEUVER NO. 6; FIRE 4-3-3 / –; HITS 2

49
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 11

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	18	8	4	2	–	–	–

SPECIAL RULES (ADV & OP): Variant Bomb Load is cut in half. Had Dual Controls. ⓐ Bomb Load cut in half for long-range missions.

SIGHTING VALUES (OP): 12 / 51 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 43 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E E E

VARIANTS (ADV): Extra Gun. (Points: ㉝)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		3	(3)-(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	14	4 x 6		14	6 x 6	

STRATEGIC GAME INFORMATION: COMBAT 5-2 RANGE 14-17 ⓐ; CLIMB 350-200; GLIDE 90-120-150
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 1 DIVE 3; CEILING 8; MANEUVER NO.; FIRE 2-2-1 / 2-1-1; HITS 2

48
SIZE MODIFIER: +5 STEADY SHOT(OP): ––––
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): 9

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	16	–	–	–	18	18	16	8	3	1	–

SPECIAL RULES (ADV & OP): Crews 3 and 4 are in the same cockpit and can man any two of the Guns at B,C, or D during any one Turn. May not fly Inverted. ⓐ Bomb Load cut in half for long-range missions.

SIGHTING VALUES (OP): 12 / 31 / 26 / 31 / U: 33 D: 32 / 35 / 34 / 42 / 6
CREW AND GUN POSITIONS: A 1 2 3,4 B,C D

PLANE TARGET CHARACTERISTICS CHART
W 6 S 7 L 4 T 3
CREW 1 3 2 ③ 3 3 4 3 5 – 6 – 7 – 8 –
ENGINES I E 3TLW E – E – E 3TRW

PLANE GUN CHARACTERISTICS CHART	A	B	C	D	E	F
GUN POS.	(3)-(3)	(3)	(3)	(3)		
RANGE	10	10	10	8		
OPER.	Crew 1	Crew 3 or 4	Crew 3 or 4	Crew 3 or 4		
AMMO (OP)	6 x 6	9 x 6				

STRATEGIC GAME INFORMATION: COMBAT 7-11 RANGE 12-24 ⓐ; CLIMB 330-190; GLIDE 110-140-170
MASS GAME INFORMATION: SPEEDS 3-5-6; CLIMB 1 DIVE 2; CEILING 5; MANEUVER NO. 5; FIRE 4-3-2 / 4-3-2; HITS 3

45
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-3
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): 12

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	4	2	1	–	–	–	–

SPECIAL RULES (ADV & OP): Use numbers in parenthesis when Banking, Turning, or Rolling to the right.

SIGHTING VALUES (OP): 12 / 45 / 36 / 44 / U: 41 D: 52 / 43 / 42 / 52 / 6
CREW AND GUN POSITIONS: A,D E 1

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): Alternate armament (few used). (Points: ㉞)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3			3	[3]	
RANGE	10			10	8	
OPER.	Crew 1			Crew 1	Crew 1	
AMMO (OP)	22-22			28	4 x 6	

STRATEGIC GAME INFORMATION: COMBAT 7-1 RANGE 8; CLIMB 520-420; GLIDE 160-210-260
MASS GAME INFORMATION: SPEEDS 3-5-9; CLIMB 2 DIVE 6; CEILING 9; MANEUVER NO. 9; FIRE 4-3-3 / ––––; HITS 2

42
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 11

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	20	–	–	–	12	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant carries one-half the Bomb Load, and uses the Climb numbers in parenthesis.

SIGHTING VALUES (OP): 12 / 46 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Bristol F.2B Mk.II (early 1918) (Points: ㊴)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		3	(3)-(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	22	6 x 6		22	6 x 6	

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 9; CLIMB 500(440)-310(240); GLIDE 80-110-140
MASS GAME INFORMATION: SPEEDS 3-6-8; CLIMB 2 DIVE 4; CEILING 9; MANEUVER NO. 7; FIRE 2-2-1 / 2-1-1; HITS 2

61
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-4
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): 7

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	4	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Use Loaded Modifiers for the Gun C version (Points: ⑲). On the Fokker E.II Guns D and F require "11-13" to clear a Jam. On the Fokker E.III, Guns A and C require "11-14" to clear a Jam.

SIGHTING VALUES (OP): 12 / 45 / 35 / 35 / U: 41 D: 46 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,C,D,F 1

PLANE TARGET CHARACTERISTICS CHART
W 5 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): Fokker E.II (earlier planes used Gun D). (Points: ⑳)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	2	OR	2-2	2	OR	2
RANGE	10		10	10		10
OPER.	Crew 1		Crew 1	Crew 1		Crew 1
AMMO (OP)	75		28-28	4 x 6		75

STRATEGIC GAME INFORMATION: COMBAT 4-0 RANGE 6; CLIMB 290-160; GLIDE 220-290-360
MASS GAME INFORMATION: SPEEDS 2-4-6; CLIMB 1 DIVE 4; CEILING 5; MANEUVER NO. 4; FIRE 2-2-1 / ––––; HITS 2

60
SIZE MODIFIER: +1 STEADY SHOT(OP): –
FLEXIBLE GUN TURNING (ADV): A,C:1/Turn. D:2/Turn
RELOAD TIME (OP): 7

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	6	3	–	–	–	–	–

SPECIAL RULES (ADV & OP): The Gun C plane is the Aviatik C.Ia (available late 1915). ⓐ Crew 2 is the pilot with Gun A. Crew 1 is the pilot with Gun C and on the Variant.

SIGHTING VALUES (OP): 12 / 43 / 42 / 43 / U: 35 D: 43 / 35 / 46 / 6
CREW AND GUN POSITIONS: A 1 2 C,D

PLANE TARGET CHARACTERISTICS CHART
W 4 S 6 L 4 T 3
CREW 1 3 2 ③ 3 – 4 – 5 – 6 – 7 – 8 – ⓐ
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Austrian Aviatik B. III-series 34 (introduced mid 1915-160hp Austro-Daimler). (POINTS: ⑱ 33-16-8-4)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)	OR	(3)	(3)		
RANGE	10		10	8		
OPER.	Crew 1		Crew 2	Crew 2		
AMMO (OP)	3 x 6		3 x 6	3 x 6		

STRATEGIC GAME INFORMATION: COMBAT 4-1 RANGE 9; CLIMB 220-120; GLIDE 120-160-200
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 3; CEILING 5; MANEUVER NO. 4; FIRE – / 2-1-1; HITS 2

56
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-6
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	10	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Use Power, Climb, Zoom, Bank, and Roll numbers in parenthesis for Variant. Gun C carried if camera is carried (Points: ㉘). Variant can take off and land only from water. ⓐ No Load may be carried for long-range missions.

SIGHTING VALUES (OP): 12 / 53 / 41 / 42 / U: 41 D: 43 / 43 / 42 / 52 / 6
CREW AND GUN POSITIONS: A,C,D 1

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): I.S.V.A. and S.V.A. – A.M. Seaplanes (50 built-mid 1918). (Points: ㉙ 25-12-6-3)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3	OR	3	3-3		
RANGE	10		10	10		
OPER.	Crew 1		Crew 1	Crew 1		
AMMO (OP)	22-22		28	22-22		

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 9-18 ⓐ; CLIMB 700-(480)-520(290); GLIDE 80-110-140
MASS GAME INFORMATION: SPEEDS 2-7-9; CLIMB 2 DIVE 6; CEILING 9; MANEUVER NO. 6; FIRE 4-3-3 / ––––; HITS 2

53
SIZE MODIFIER: +3 STEADY SHOT(OP): ––––
FLEXIBLE GUN TURNING (ADV): A,D: 2/Turn B,E: 1/Turn
RELOAD TIME (OP): 7

LOAD(OP) 2,3	C	G	R	S	T	1	2	3	4	5	6	7
	X	16	–	–	1	16	12	6	4	2	–	–

SPECIAL RULES (ADV & OP): May not fly Inverted. Ceiling carrying Torpedo is "100". Use Loaded modifiers in parenthesis when a Torpedo is carried. Use Climb numbers in parenthesis for Variant. ⓐ Half Bomb Load for long-range missions.

SIGHTING VALUES (OP): 12 / 31 / 26 / 31 / U: 34 D: 35 / 31 / 33 / 34 / 6
CREW AND GUN POSITIONS: A,D 1 2,3 4 B,E

PLANE TARGET CHARACTERISTICS CHART
W 6 S 5 L 4 T 3
CREW 1 3 2 ③ 3 ③ 4 3 5 – 6 – 7 – 8 –
ENGINES I E 3TLW E 3P E – E 3TRW

VARIANTS (ADV): Extra armament (cannot carry Torpedo or make long-range missions). (Points: ㊶)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)	(3)		(3)-(3)	(3)-(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 4		Crew 1	Crew 4	
AMMO (OP)	5 x 6	3 x 6		6 x 6	4 x 6	

STRATEGIC GAME INFORMATION: COMBAT 5-6 RANGE 11-21 ⓐ; CLIMB 230(200)-150(130); GLIDE 110-150-190
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 2; CEILING 6; MANEUVER NO. 1; FIRE 2-1-1 / 2-1-1; HITS 3

54
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): B: 11 D: 11 E: 10

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	20	–	–	–	4	2	1	–	–	–	–

SPECIAL RULES (ADV & OP): Use Climb numbers in parenthesis for PD model. The Pomilio PD may not perform Banks or Slips while at Dive Speed if Loaded.

SIGHTING VALUES (OP): 12 / 51 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 43 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 7 S 5 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): PD and early PE armament. (Points: ㉗)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		2	(3)	
RANGE	10	10		8	8	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	28	6 x 6		6 x 3	6 x 3	

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 11; CLIMB 380(330)-210(180); GLIDE 90-120-150
MASS GAME INFORMATION: SPEEDS 3-5-8; CLIMB 1 DIVE 3; CEILING 7; MANEUVER NO. 3; FIRE 2-2-1 / 2-1-1; HITS 2

72
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Use Climb numbers in parenthesis for Variant. Wing Failures through February, 1917.

SIGHTING VALUES (OP): 12 / 52 / 41 / 42 / U: 41 D: 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,D 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Oeffag-Albatros D.III (mid 1917). (Points: ㉚)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3			3-3		
RANGE	10			10		
OPER.	Crew 1			Crew 1		
AMMO (OP)	28-28			17-17		

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 6; CLIMB 460(510)-260(390); GLIDE 170-220-270
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 2 DIVE 5; CEILING 7; MANEUVER NO. 7; FIRE 4-3-3 / ––––; HITS 2

70
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): ––––

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	10	–	–	–	4	4	2	1	–	–	–

SPECIAL RULES (ADV & OP): –––––

SIGHTING VALUES (OP): 12 / 51 / 33 / 43 / U: 35 D: 42 / 35 / 34 / 42 / 6
CREW AND GUN POSITIONS: A 1 2 B

PLANE TARGET CHARACTERISTICS CHART
W 7 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): ––––

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)				
RANGE	10	10				
OPER.	Crew 1	Crew 2				
AMMO (OP)	28	14				

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 11; CLIMB 300-160; GLIDE 100-130-160
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 1 DIVE 3; CEILING 8; MANEUVER NO. 2; FIRE 2-2-1 / 2-1-1; HITS 2

68
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Where different, the Sighting Numbers for the Albatros D.I are listed second. Power and Climb numbers in parenthesis apply to the Variant.

SIGHTING VALUES (OP): 12 / 52 / 41-44 / 42-45 / U: 41 D: 45 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A D 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Oeffag-Albatros D.II (late 1916). (Points: ㉙)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3			3-3		
RANGE	10			6		
OPER.	Crew 1			Crew 1		
AMMO (OP)	28-28			17-17		

STRATEGIC GAME INFORMATION: COMBAT 6-0 RANGE 5; CLIMB 480(530)-––––; GLIDE 170-230-290
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 2 DIVE 5; CEILING 7; MANEUVER NO. 7; FIRE 4-3-3 / ––––; HITS 2

67
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	X	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): The Rumpler 6B2 can carry 4 x "1" or 1 x "2" Bombs. These seaplanes can take off and land only from water. No Gun is carried if a camera is carried.

SIGHTING VALUES (OP): 12 / 52 / 44 / 45 / U: 41 D: 45 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A 1

PLANE TARGET CHARACTERISTICS CHART
W 6 S 7 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): ––––

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3					
RANGE	10					
OPER.	Crew 1					
AMMO (OP)	28					

STRATEGIC GAME INFORMATION: COMBAT 4-1 RANGE 12; CLIMB 190-110; GLIDE 110-140-170
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 4; CEILING 7; MANEUVER NO. 6; FIRE 2-2-1 / ––––; HITS 2

63
SIZE MODIFIER: +1 STEADY SHOT(OP): 1-5
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): 7

LOAD(OP) 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	8	4	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant uses Climb number in parenthesis.

SIGHTING VALUES (OP): 12 / 46 / 36 / 44 / U: 35 D: 44 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: D 1 2 A,E

PLANE TARGET CHARACTERISTICS CHART
W 6 S 7 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Fixed gun added (mid 1916) (Points: ㉓)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)			2	(3)	
RANGE	10			10	10	
OPER.	Crew 2			Crew 1	Crew 2	
AMMO (OP)	4 x 6			22	4 x 6	

STRATEGIC GAME INFORMATION: COMBAT 4-1 RANGE 12; CLIMB 180(140)-150(120); GLIDE 120-160-200
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 3; CEILING 5; MANEUVER NO. 6; FIRE 2-2-1 / 2-1-1; HITS 2

78
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	4	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant must be armed with Incendiary ammunition. Use Climb and Zoom numbers in parenthesis for Variant. Variant may not carry Bomb Load.

SIGHTING VALUES (OP): 12 / 52 / 36 / 44 / U: 41 D: 53 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,D 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Extra gun for balloon attacks. (Points: ㉛)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3			3-3-3		
RANGE	10			10		
OPER.	Crew 1			Crew 1		
AMMO (OP)	28-28			14-14-14		

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 8; CLIMB 330(220)-190(–); GLIDE 170-220-270
MASS GAME INFORMATION: SPEEDS 3-5-8; CLIMB 1 DIVE 6; CEILING 7; MANEUVER NO. 5; FIRE 4-3-3 / ––––; HITS 2

77
SIZE MODIFIER: +7 STEADY SHOT(OP): ––––
FLEXIBLE GUN TURNING (ADV): 1/Turn
RELOAD TIME (OP): 9

LOAD(OP) 1, 2, 3	C	G	R	S	T	1	2	3	4	5	6	7
	X	20	–	–	–	24	24	18	18	6	–	1

SPECIAL RULES (ADV & OP): May not fly Inverted. Crews 7 and 8 are in the same cockpit, and can man any two of the Guns at B,C, or D during any one Turn. Crews 4 and 5 were mechanics with stations at the engines. Crew 6 monitored the fuel. ⓐ Bomb Load cut in half for long-range missions.

SIGHTING VALUES (OP): 12 / 26 / 25 / 26 / U: 32 D: 31 / 34 / 33 / 41 / 6
CREW AND GUN POSITIONS: A 1 2,3 4,5 7,8 B,C 6 D

PLANE TARGET CHARACTERISTICS CHART
W 6 S 8 L 4 T 3
CREW 1 3 2 ③ 3 ③ 4 3 5 3 6 3 7 3 8 3
ENGINES I E 3TLW E 3PLW E 3PRW E 3TRW

PLANE GUN CHARACTERISTICS CHART	A	B	C	D	E	F
GUN POS.	(3)-(3)	(3)	(3)	(3)		
RANGE	10	10	10	8		
OPER.	Crew 1	Crew 7 or 8	Crew 7 or 8	Crew 7 or 8		
AMMO (OP)	8 x 6	16 x 6				

STRATEGIC GAME INFORMATION: COMBAT 8-8 RANGE 21-30 ⓐ; CLIMB 250-130; GLIDE 110-140-170
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 2; CEILING 6; MANEUVER NO. 2; FIRE 2-1-1 / 4-3-2; HITS 5

75
SIZE MODIFIER: 0 STEADY SHOT(OP): 3-4
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Wing failures through mid 1917. Oberursel Engine: Speeds at 1-200 Altitude Levels are the same as at Altitude Levels 201-300. Ceiling is "730". Use Power and Climb numbers in parenthesis.

SIGHTING VALUES (OP): 12 / 45 / 35 / 42 / U: 36 D: 46 / 43 / 42 / 52 / 6
CREW AND GUN POSITIONS: A 1

PLANE TARGET CHARACTERISTICS CHART
W 5 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES R E 3T E – E – E –

VARIANTS (ADV): ––––

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3					
RANGE	10					
OPER.	Crew 1					
AMMO (OP)	28-28					

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 5; CLIMB 780(750)-560(390); GLIDE 190-250-310
MASS GAME INFORMATION: SPEEDS 2-5-7; CLIMB 4 DIVE 4; CEILING 8; MANEUVER NO. 9; FIRE 4-3-3 / ––––; HITS 2

74
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 14

LOAD(OP) 1, 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	20	–	–	–	5	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Variant carries one-half the Bomb Load. The Climb numbers in parenthesis apply to the Variant.

SIGHTING VALUES (OP): 12 / 46 / 33 / 43 / U: 35 D: 44 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 6 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Ground Attack Version. (Points: ㉟).

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		3-3	(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	28	14		28-28	2 x 14	

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 9; CLIMB 290(260)-190(150); GLIDE 180-240-300
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 1 DIVE 4; CEILING 8; MANEUVER NO. 6; FIRE 2-2-1 / 2-1-1; HITS 2

73
SIZE MODIFIER: +3 STEADY SHOT(OP): ––––
FLEXIBLE GUN TURNING (ADV): 1/Turn.
RELOAD TIME (OP): A,B: 14 D,E,F: 9

LOAD(OP) 1, 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	12	–	–	–	18	18	12	6	–	–	–

SPECIAL RULES (ADV & OP): May not fly Inverted. The Ceiling for the G. IV is "660", for the G. V it is "860". ⓐ Bomb Load cut in half for long-range missions. ⓑ circled "6" does not apply to G.V. Gotha G.V. Points: ㊲.

SIGHTING VALUES (OP): 12 / 31 / 31 / 32 / U: 34 D: 33 / 36 / 35 / 43 / 6
CREW AND GUN POSITIONS: A,D 1 2 3 B,E F

PLANE TARGET CHARACTERISTICS CHART
W 6 S 8 L 4 T 3
CREW 1 3 2 ③ 3 3 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3PLW E – E – E 3PRW

VARIANTS (ADV): Extra Guns (only with half Bomb Load and normal range). (Points: G.IV: ㊸ G.V: ㊹)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)	(3)		(3)-(3)	(3)	(3)
RANGE	10	10		10	10	8
OPER.	Crew 1	Crew 3		Crew 1	Crew 3	Crew 3
AMMO (OP)	2 x 14	2 x 14		10 x 6	10 x 6	

STRATEGIC GAME INFORMATION: COMBAT 5-8 RANGE 12-18 ⓐ; CLIMB 380-200; GLIDE 110-140-170
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 2; CEILING 7; MANEUVER NO. 1; FIRE 2-1-1 / 2-1-1; HITS 3

86
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): –
RELOAD TIME (OP): –

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP):

SIGHTING VALUES (OP): 12 / 52 / 41 / 43 / U: 41 D: 46 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A 1

PLANE TARGET CHARACTERISTICS CHART
W 8 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8
ENGINES I E 3T E – E – E –

VARIANTS (ADV): –

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3					
RANGE	10					
OPER.	Crew 1					
AMMO (OP)	28-28					

STRATEGIC GAME INFORMATION: COMBAT 7-1 RANGE 5; CLIMB 800-620; GLIDE 170-220-270
MASS GAME INFORMATION: SPEEDS 2-6-8; CLIMB 3 DIVE 5; CEILING 9; MANEUVER NO. 7; FIRE 4-3-3 / –; HITS 2

84
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 14

LOAD(OP) 1, 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	10	–	–	–	8	4	2	1	–	–	–

SPECIAL RULES (ADV & OP): Variant may not be flown Inverted, flies as if Loaded, and has ceiling of "450". Climb Modifier in parenthesis ("C") are armored - "1-4" confirms Hit. Bomb Load cut in half on Variant, but no additional Loaded modifiers.

SIGHTING VALUES (OP): 12 / 51 / 33 / 41 / U: 33 D: 42 / 35 / 34 / 42 / 6
CREW AND GUN POSITIONS: A,D 1 2 B,E

PLANE TARGET CHARACTERISTICS CHART
W 7 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Ground Attack Version. (POINTS: ㉘ 37-18-9-5).

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		3-3	(3)	
RANGE	10	10		10	10	
OPER.	Crew 1	Crew 2		Crew 1	Crew 2	
AMMO (OP)	28	14		28-28	2 x 14	

STRATEGIC GAME INFORMATION: COMBAT 5-2 RANGE 11; CLIMB 400-270 (160); GLIDE 80-110-140
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 1 DIVE 3; CEILING 8; MANEUVER NO. 3; FIRE 2-2-1 / 2-1-1; HITS 2

82
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): ––––
RELOAD TIME (OP): ––––

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Guns on Albatros D.Va require "11-16" or "21-22" to clear a Jam. Power and Climb numbers in parenthesis apply to the Variant.

SIGHTING VALUES (OP): 12 / 52 / 41 / 42 / U: 41 D: 43 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A,D 1

PLANE TARGET CHARACTERISTICS CHART
W 7 S 7 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): Oeffag-Albatros D.III. (Points: ㉛)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3			3-3		
RANGE	10			8		
OPER.	Crew 1			Crew 1		
AMMO (OP)	28-28			17-17		

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 6; CLIMB 500(540)-360(380); GLIDE 170-220-270
MASS GAME INFORMATION: SPEEDS 3-5-8; CLIMB 2 DIVE 5; CEILING 8; MANEUVER NO. 7; FIRE 4-3-3 / ––––; HITS 2

80
SIZE MODIFIER: +2 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): 14

LOAD(OP) 1, 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	20	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): May not be flown Inverted. Crew ("C"), Fuel Tank ("L"), and Engine ("E") are armored – "1-3" confirms Hit.

SIGHTING VALUES (OP): 12 / 51 / 33 / 44 / U: 36 D: 42 / 35 / 34 / 42 / 6
CREW AND GUN POSITIONS: A 1 2 B

PLANE TARGET CHARACTERISTICS CHART
W 8 S 8 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): –––––

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3	(3)				
RANGE	10	10				
OPER.	Crew 1	Crew 2				
AMMO (OP)	28-28	2 x 14				

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 6; CLIMB 160-100; GLIDE 110-150-190
MASS GAME INFORMATION: SPEEDS 3-4-6; CLIMB 1 DIVE 3; CEILING 3; MANEUVER NO. 1; FIRE 4-3-3 / 2-1-1; HITS 3

79
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): ––––

LOAD(OP) 1, 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	4	4	–	–	–	–	–

SPECIAL RULES (ADV & OP): Only Variant can carry camera. Variant is not Loaded when camera is carried, but may not carry Bombs.

SIGHTING VALUES (OP): 12 / 51 / 33 / 43 / U: 35 D: 42 / 35 / 34 / 42 / 6
CREW AND GUN POSITIONS: A 1 2 B,D

PLANE TARGET CHARACTERISTICS CHART
W 8 S 6 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): "Rubild" (Points: ⑳)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)		(3)		
RANGE	10	10		10		
OPER.	Crew 1	Crew 2		Crew 2		
AMMO (OP)	28	14		14		

STRATEGIC GAME INFORMATION: COMBAT 4-1 RANGE 11; CLIMB 500-260; GLIDE 90-120-150
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 2 DIVE 3; CEILING 11; MANEUVER NO. 2; FIRE 2-2-1 / 2-1-1; HITS 2

100
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): –
RELOAD TIME (OP): –

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): –

SIGHTING VALUES (OP): 12 / 52 / 36 / 41 / U: 41 D: 53 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A 1

PLANE TARGET CHARACTERISTICS CHART
W 8 S 6 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): –

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3					
RANGE	8					
OPER.	Crew 1					
AMMO (OP)	17-17					

STRATEGIC GAME INFORMATION: COMBAT 6-1 RANGE 5; CLIMB 750-660; GLIDE 170-220-270
MASS GAME INFORMATION: SPEEDS 3-6-8; CLIMB 2 DIVE 6; CEILING 9; MANEUVER NO. 7; FIRE 4-3-3 / –; HITS 2

98
SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): –
RELOAD TIME (OP): –

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Wing Failures through March, 1918. Guns on D. I require "11" to clear Jams.

SIGHTING VALUES (OP): 12 / 52 / 36 / 44 / U: 41 D: 54 / 43 / 42 / 53 / 6
CREW AND GUN POSITIONS: A 1

PLANE TARGET CHARACTERISTICS CHART
W 6 S 5 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): —

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3-3					
RANGE	8					
OPER.	Crew 1					
AMMO (OP)	17-17					

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 9; CLIMB 470-310; GLIDE 180-240-300
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 2 DIVE 5; CEILING 8; MANEUVER NO. 6; FIRE 4-3-3 / –; HITS 2

97
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): 2/Turn
RELOAD TIME (OP): –

LOAD(OP) 1, 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	15	–	–	–	4	2	1	–	–	–	–

SPECIAL RULES (ADV & OP): Had dual controls.

SIGHTING VALUES (OP): 12 / 46 / 33 / 43 / U: 35 D: 46 / 35 / 34 / 45 / 6
CREW AND GUN POSITIONS: A 1 2 B

PLANE TARGET CHARACTERISTICS CHART
W 6 S 7 L 2 T 3
CREW 1 ③ 2 3 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3T E – E – E –

VARIANTS (ADV): –

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3	(3)				
RANGE	8	8				
OPER.	Crew 1	Crew 2				
AMMO (OP)	28	28				

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 16; CLIMB 440-240; GLIDE 110-140-170
MASS GAME INFORMATION: SPEEDS 3-5-6; CLIMB 2 DIVE 3; CEILING 8; MANEUVER NO. 3; FIRE 2-2-1 / 2-1-1; HITS 2

95
SIZE MODIFIER: +1 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): –
RELOAD TIME (OP): –

LOAD(OP) 1	C	G	R	S	T	1	2	3	4	5	6	7
	X	4	–	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Can take off and land only from water. Variant uses Power and Climb numbers in parenthesis. Guns must be removed to carry Camera on all versions.

SIGHTING VALUES (OP): 12 / 41 / 34 / 35 / U: 41 D: 41 / 56 / 52 / 55 / 6
CREW AND GUN POSITIONS: A,D 1

PLANE TARGET CHARACTERISTICS CHART
W 8 S 7 L 2 T 3
CREW 1 ③ 2 – 3 – 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3PW E – E – E –

VARIANTS (ADV): Late production (early 1918 -230hp Hiero). POINTS: ㉙

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	3			3-3		
RANGE	8			8		
OPER.	Crew 1			Crew 1		
AMMO (OP)	34			28-28		

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 11; CLIMB 330(380) - 200(230); GLIDE 100-130-160
MASS GAME INFORMATION: SPEEDS 3-5-7; CLIMB 1 DIVE 4; CEILING 6; MANEUVER NO. 7; FIRE 2-2-1 / –; HITS 2

93
SIZE MODIFIER: +2 STEADY SHOT(OP): –
FLEXIBLE GUN TURNING (ADV): A,C,D:2/Turn. F: 1 Turn.
RELOAD TIME (OP): 7

LOAD(OP) 1, 2	C	G	R	S	T	1	2	3	4	5	6	7
	X	8	–	–	–	8	6	4	2	–	–	–

SPECIAL RULES (ADV & OP): Can take off and land only from water. Crew 3 carried only on Lohner R (POINTS: ㉓ 47-23-12-6). Only Lohner R may carry Camera. With F Gun no Bombs are carried, but treat as Loaded. Lohner R and F Gun versions may not fly Inverted.

SIGHTING VALUES (OP): 12 / 33 / 32 / 33 / U: 35 D: 34 / 44 / 43 / 44 / 6
CREW AND GUN POSITIONS: A,C,D,E 1 2 3

PLANE TARGET CHARACTERISTICS CHART
W 6 S 7 L 2 T 3
CREW 1 3 2 ③ 3 3 4 – 5 – 6 – 7 – 8 –
ENGINES I E 3PW E – E – E –

VARIANTS (ADV): Italian Macchi L.1 (late 1915-150 built). (POINTS: D: ㉑ F: ⑳)

PLANE GUN / VARIANT GUN	A	B	C	D	E	F
GUN POS.	(3)	OR	(3)	(2)	OR	(CN)
RANGE	8		10	8		4(8)
OPER.	Crew 1		Crew 1	Crew 1		Crew 1
AMMO (OP)	14		4 x 6	6 x 3		10

STRATEGIC GAME INFORMATION: COMBAT 5-1 RANGE 12; CLIMB 220-80; GLIDE 130-170-210
MASS GAME INFORMATION: SPEEDS 2-4-5; CLIMB 1 DIVE 2; CEILING 5; MANEUVER NO. 6; FIRE 2-1-1 / –; HITS 2

4 VOISIN 5 (150 hp Salmson Canton-Unne)

FULL NAME: Compagnie Gabriel Voisin Type 5 LAS

FRANCE — POINT VALUE: (16) 32-16-8-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-4	5	1	5	1	+1	6	1	2	3	4	3	4	4	6	X	X	X	X
101-200	1-2	3-4	5	1	5	1	+1	7	1	2	3	4	3	4	4	6	X	X	X	X
201-300	1-2	3-4	5	1	5	1/5	+1	7	1	2	3	4	3	4	4	6	X	X	X	X
301-400	1-2	3-4	5-6	1	5	1/10	+1	7	1	2	3	4	3	4	4	6	X	X	X	X
401-450	1-3	4	5-6	1	5	1/17	+1	7	1	2	3	4	3	4	4	6	X	X	X	X
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-2	+1	P	+1	P	+1	P	P	P	P	P	P	P

NOTES: Introduced in mid 1915. About 350 were built. Used by France and Russia (LAS version only). Primarily used as a bomber and for ground attack. Performance and armament of the Voisin 3LA (introduced in late 1914—used by France, Britain, Belgium, Italy, and Russia) is very similar. Russian-built models called "Voisin Ivanov" or "I.V.".

6 NIEUPORT 11 (80 hp Le Rhone 9 C)

FULL NAME: Societe Anonyme des Etablissements Nieuport N. II C. I

FRANCE — POINT VALUE: (23) 17-9-4-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-3	-1/2		+1/3												
1-100	1-2	3-5	6	1	6	2	+2	9	0	1	2	4	3	4	4	6	4	6	2	3
101-200	1-2	3-5	6	1	6	2	+2	10	0	1	2	4	3	4	4	6	5	6	2	3
201-300	1-2	3-4	5-6	1	6	1	+2	10	0	1	2	4	3	4	4	6	5	7	2	3
301-400	1-3	4	5-6	1	5	1	+2	11	0	1	3	4	3	4	4	6	5	7	2	3
401-500	1-3	4	5-7	1	5	1	+2	11	0	1	3	5	3	4	4	6	5	7	2	3
501-600	1-3	4	5-7	1	5	1/4	+2	12	0	1	3	5	3	5	5	7	5	7	2	4
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-3	0	+1	0	+1	0	+1	+1	P	P	P	P	P

NOTES: Introduced in mid 1915. Used by France, Britain, Italy, Belgium, and Russia. Primarily used as a fighter. Nicknamed "Bebe", "13 Meter Nieuport", "Nieuport Scout", and "Silver Hawk".

8 NIEUPORT 12 (130 hp Clerget 9 B)

FULL NAME: Societe Anonyme des Etablissements Nieuport N.12A.2

FRANCE — POINT VALUE: (28) 29-15-7-4

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-5	6	1	6	2	+1	9	1	2	3	4	4	5	5	7	6	8	4	6
101-200	1-2	3-5	6	1	6	2	+1	10	1	2	3	4	4	5	5	7	6	8	4	6
201-300	1-3	4-5	6	1	6	1	+2	10	1	2	3	4	4	5	5	7	6	8	4	6
301-400	1-3	4	5-6	1	5	1	+2	11	1	2	3	4	4	6	5	8	6	9	4	7
401-500	1-3	4	5-7	1	5	1/3	+2	11	1	2	3	5	4	6	5	8	6	9	5	7
501-600	1-3	4	5-7	1	5	1/5	+2	12	1	2	3	5	4	6	5	8	6	9	5	8
601-620	1-3	4	5-7	1	5	1/12	+2	12	1	2	3	5	4	6	6	8	7	9	5	8
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-2	P	-3	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in late 1915. Used by France, Britain, Belgium, Italy, and Russia. Primarily used for reconnaissance.

11 NIEUPORT 17 (110 hp Le Rhone 9J)

FULL NAME: Societe Anonyme des Etablissements Nieuport N.17C.1

FRANCE — POINT VALUE: (26) 18-9-5-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-3	-1/2		+1/3												
1-100	1-2	3-5	6	2	5	3(3)	+2(2)	11	0	1	2	4	3	4	4	6	5	7	2	4
101-200	1-2	3-5	6	2	5	3(2)	+2(2)	12	0	1	2	4	3	4	4	6	5	7	2	4
201-300	1-2	3-5	6-7	2	4	3(2)	+2(2)	12	0	1	2	4	3	4	4	6	5	7	3	4
301-400	1-3	4-5	6-7	1	4	2(1)	+2(2)	13	0	1	2	4	3	4	4	6	5	7	3	4
401-500	1-3	4-5	6-7	1	4	1(1/2)	+3(2)	13	0	1	3	4	3	4	4	6	5	8	3	4
501-600	1-3	4	5-7	1	4	1/3(1/5)	+3(2)	14	0	1	3	4	4	5	5	7	6	8	3	5
601-690	1-3	4	5-8	1	4	1/9(—)	+3(—)	14	0	1	3	5	4	5	5	7	6	8	3	5
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+2	P	P	P	P	P	P	P

NOTES: Introduced in mid 1916. Used by France, Britain, Italy, Belgium, and Russia. Primarily used as a fighter. Nicknamed "Superbebe" and "15 Meter Nieuport". British Nieuports generally armed with Gun C.

12 F.B.A. Type C (130 hp Clerget)

FULL NAME: France-British Aviation Type C

FRANCE — POINT VALUE: (20) 32-16-8-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-4	5	1	6	1	+1	7	0	1	2	3	3	4	4	6	5	7	4	6
101-200	1-2	3-4	5	1	6	1	+1	7	0	1	2	3	3	5	4	7	5	7	4	6
201-300	1-2	3-4	5	1	6	1/2	+1	7	0	1	2	4	3	5	5	7	5	8	5	6
301-400	1-2	3	4-6	1	6	1/5	+1	8	0	1	2	4	4	5	5	7	6	8	5	7
401-500	1-2	3	4-6	1	6	1/12	+1	8	0	1	2	4	4	5	5	8	6	8	5	7
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-2	P	-3	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in mid 1916. 982 Type Cs were built. Used by France, Britain, Italy, and Russia. Primarily used for maritime reconnaissance.

13 SPAD 7 (180 hp Hispano-Suiza 8 Ac)

FULL NAME: Societe pour l'Aviation et ses Derives S.7C.1

FRANCE — POINT VALUE: (27) 21-10-5-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-3	-1/1		+1/3												
1-100	1-2	3-6	7	3	5	3(2)	+3(3)	16	0	2	3	6	4	6	5	8	6	9	3	5
101-200	1-2	3-6	7-8	2	5	2(1)	+3(3)	17	0	2	3	6	4	6	5	8	6	9	3	5
201-300	1-2	4-6	7-8	2	5	2(1)	+4(3)	17	0	2	3	6	4	7	5	9	6	9	3	6
301-400	1-3	4-6	7-8	2	4	2(1/2)	+4(3)	17	0	2	3	6	4	7	5	9	6	10	3	6
401-500	1-3	4-5	6-9	2	4	1(1/3)	+4(3)	18	1	2	3	6	5	7	6	9	6	10	4	6
501-600	1-3	4-5	6-9	2	4	1(1/5)	+5(4)	19	1	2	3	7	5	7	6	9	7	10	4	6
601-700	1-3	4-5	6-9	2	4	1/4(1/8)	+5(4)	20	1	2	4	7	5	8	6	10	7	11	4	7
701-720	1-4	5	6-10	1	4	1/11(—)	+5(—)	21	1	3	4	7	5	8	7	10	7	11	4	7
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	-1	-1	0	0	-2	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Model with this engine introduced in late 1916. About 6,000 were built with this engine. Used by France, Britain, Italy, Belgium, Russia, and the United States. Primarily used as a fighter. Nicknamed the "French Albatros".

16 BREGUET 14B.2 (300 hp Renault Fcx)

Societe Anonyme des Ateliers d'Aviation Louis Breguet

FULL NAME: Br. 14B.2

FRANCE — POINT VALUE: (38) 39-20-10-5

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-6	7	2	6	3(3)	+1	12	0	1	4	7	4	7	5	9	6	9	5	6
101-200	1-2	3-6	7	2	6	2(3)	+1	12	0	1	4	7	4	7	5	9	6	9	5	6
201-300	1-2	3-5	6-7	2	5	2(2)	+2	13	0	1	4	7	5	7	6	9	7	10	5	6
301-400	1-2	3-5	6-7	2	5	2(2)	+2	13	0	2	4	7	5	8	6	10	7	10	6	7
401-500	1-2	3-4	5-8	1	5	1(1)	+2	13	0	2	4	7	5	8	6	10	7	11	6	7
501-600	1-2	3-4	5-8	1	5	1(1)	+2	14	0	2	4	8	5	8	6	10	7	11	6	7
601-700	1-3	4	5-8	1	5	1/2(1/2)	+2	14	1	2	4	8	6	9	7	11	8	12	6	7
701-760	1-3	4	5-8	1	5	1/8(1/7)	+2	15	1	2	5	8	6	9	7	11	8	12	7	8
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	-1	-2	0	0	-1	P	-3	+2	+3	+3	+4	+2	+4	P	P	P	P	P	P

NOTES: Introduced in mid 1917. A total of 5,500 Br. 14s of all types were built during the war (8,000 built through 1926). Used by France, Belgium, and the United States. Primarily used as a bomber.

18 HANRIOT HD.1 (110 hp Le Rhone 9 J)

Societe Anonyme des Appareils

FULL NAME: d'Aviation Hanriot HD.IC.I

FRANCE — POINT VALUE: (26) 18-9-5-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-6	7	2	6	4(3)	+2(2)	13	0	1	3	4	3	4	4	6	5	8	3	6
101-200	1-2	3-6	7	2	5	3(3)	+2(2)	13	0	1	3	5	3	5	4	7	5	8	3	6
201-300	1-2	3-5	6-7	2	5	3(2)	+3(2)	14	0	1	3	5	3	5	4	7	5	9	3	6
301-400	1-3	4-5	6-8	2	5	3(2)	+3(2)	15	1	2	3	5	3	5	4	7	6	9	3	6
401-500	1-3	4-5	6-8	1	5	2(1)	+3(2)	15	1	2	3	5	4	6	5	8	6	9	4	6
501-600	1-3	4-5	6-8	1	5	1(1)	+3(3)	16	1	2	3	5	4	6	5	8	6	10	4	6
601-700	1-3	4-5	6-8	1	4	1(1/3)	+4(3)	17	1	2	3	5	4	6	5	8	7	10	4	7
701-800	1-4	5	6-9	1	4	1/4(1/7)	+4(3)	17	1	2	3	6	4	7	5	9	7	11	4	7
801-840	1-4	5	6-9	1	4	1/8(—)	+4(—)	18	1	2	4	6	4	7	5	9	7	11	4	7
(OP) LOADED	+1	0	-1	0	0	-1(-2)	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1917. 956 were built. Used by Italy, Belgium, and the French Navy (early 1918). Primarily used as a fighter.

19 SPAD 13 (220 hp Hispano-Suiza 8 Ba)

FULL NAME: Societe pour l'Aviation et ses Derives S.13C.1

FRANCE — POINT VALUE: (34) 23-11-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-3	-1/2		+1/3												
1-100	1-3	4-7	8	3	5	5(4)	+3(3)	17	0	1	3	6	4	6	5	8	6	9	3	6
101-200	1-3	4-7	8	3	5	4(4)	+4(3)	18	0	1	3	6	4	7	5	9	6	10	3	6
201-300	1-3	4-7	8-9	3	5	3(3)	+4(3)	18	0	1	3	6	4	7	5	9	6	10	3	6
301-400	1-3	4-7	8-9	3	5	3(2)	+4(4)	19	0	1	4	6	5	7	6	9	6	10	3	6
401-500	1-3	4-7	8-9	3	5	2(2)	+5(4)	19	0	2	4	6	5	8	6	10	7	11	3	6
501-600	1-3	4-6	7-10	2	4	2(1)	+5(4)	20	1	2	4	7	5	8	6	10	7	11	4	6
601-700	1-3	4-5	6-10	2	4	1(1)	+5(5)	21	1	2	4	7	5	9	6	11	7	12	4	7
701-800	1-3	4-5	6-10	2	4	1/2(1/5)	+6(5)	22	1	2	4	7	6	9	7	11	8	12	4	7
801-850	1-4	5	6-10	1	4	1/9(—)	+6(—)	23	1	2	4	8	6	9	7	11	8	12	4	7
(OP) LOADED	+1	-1	-1	0	0	-2	P	-4	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Model with this engine introduced in mid 1917. Over 8,400 were built, with a variety of engines. Used by France, Britain, Italy, Belgium, and the United States. Primarily used as a fighter.

21 SALMSON 2A.2 (260 hp Salmson Canton-unne)

FULL NAME: Societe des Moteurs Salmson 2A.2

FRANCE — POINT VALUE: (34) 35-18-9-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-6	7	2	5	2	+2	9	2	4	3	5	5	7	6	9	7	11	6	X
101-200	1-2	3-6	7	2	5	2	+2	9	2	4	3	6	5	8	6	10	8	12	6	X
201-300	1-2	3-6	7	2	5	2	+2	10	2	4	3	6	5	8	6	10	8	12	6	X
301-400	1-3	4-5	6-8	2	4	1	+2	10	2	4	4	6	6	8	7	10	8	13	7	X
401-500	1-3	4-5	6-8	2	4	1	+3	10	2	5	4	6	6	9	7	11	9	13	7	X
501-600	1-3	4-5	6-8	1	4	1/2	+3	11	2	5	4	7	6	9	7	11	9	14	7	X
601-700	1-3	4-5	6-8	1	4	1/4	+3	11	2	5	4	7	6	10	7	12	9	14	8	X
701-800	1-3	4-5	6-9	1	4	1/7	+3	12	3	5	4	7	7	10	8	12	10	15	8	X
801-820	1-3	4	5-9	1	4	1/16	+3	12	3	5	4	8	7	11	8	13	10	16	9	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-3	+1	+2	+2	+3	+2	+4	P	P	P	P	P	P

NOTES: Introduced in early 1918. About 3,200 were built. Used by France and the United States. Primarily used for reconnaissance, ground attacks, and as a bomber.

23 SPAD 13 (235 hp Hispano-Suiza 8 Be)

FULL NAME: Societe pour l'Aviation et ses Derives S. 13C.1

FRANCE — POINT VALUE: (34) 23-11-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-3	-1/2		+1/3												
1-100	1-3	4-7	8	4	5	5(4)	+4(3)	17	0	1	3	6	4	6	5	8	6	9	3	6
101-200	1-3	4-7	8	3	5	4(3)	+4(3)	18	0	1	3	6	4	7	5	9	6	10	3	6
201-300	1-3	4-7	8-9	3	5	4(3)	+4(3)	18	0	1	4	6	4	7	5	9	6	10	3	6
301-400	1-3	4-7	8-9	3	5	3(2)	+4(3)	19	0	2	4	6	5	8	6	10	7	10	3	6
401-500	1-3	4-7	8-9	3	5	2(1)	+5(3)	19	1	2	4	7	5	8	6	10	7	11	3	6
501-600	1-3	4-7	8-10	3	4	2(1)	+5(4)	20	1	2	4	7	5	8	6	10	7	11	4	6
601-700	1-3	4-6	7-10	2	4	1(1/2)	+5(4)	21	1	2	4	7	5	9	6	11	7	12	4	7
701-800	1-3	4-6	7-10	2	4	1/2(—)	+6(—)	22	1	2	4	7	6	9	7	11	8	12	4	7
801-920	1-4	5	6-10	1	4	1/7(—)	+6(—)	23	1	2	5	8	6	10	7	12	8	13	4	7
(OP) LOADED	+1	-1	-1	0	0	-2	P	-4	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Model with this engine introduced in early 1918. Over 8,400 were built, with a variety of engines. Used by France, Britain, Italy, Belgium, and the United States. Primarily used as a fighter.

24 SHORT 184 (225 hp Sunbeam/240 hp Renault)

FULL NAME: Short Brothers Seaplane, Admiralty Type 84

GREAT BRITAIN — POINT VALUE: (19) 40-20-10-5

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-4	5	1	6	1(1/9)	+1	6	1	2	3	4	4	5	5	6	X	X	X	X
101-200	1-2	3-4	5	1	6	1/2(1/10)	+1	7	1	2	3	4	4	5	5	7	X	X	X	X
201-260	1-2	3	4-5	1	6	1/4(1/12)	+1	7	1	2	3	4	4	5	5	7	X	X	X	X
301-400	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
401-500	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1-100	1-2	3-4	5	1	6	1(1/8)	+1	6	1	2	3	4	4	5	5	6	X	X	X	X
101-200	1-2	3-4	5	1	6	1(1/9)	+1	7	1	2	3	4	4	5	5	7	X	X	X	X
201-280	1-2	3	4-5	1	6	1/5(1/13)	+1	7	1	2	3	4	4	5	5	7	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1(0)	P	-2	+2	+3	+2	P	+3	P	P	P	P	P	P	P

NOTES: Upper set applies to 225 hp, lower set to 240 hp. The 225 hp version introduced in early 1915, the 240 hp version introduced in mid 1916. A total of 650-900 of all models were built. Used by Britain. Primarily used for maritime reconnaissance and as a bomber.

27 AIRCO D.H.2 (100 hp Gnome Monosoupape)

FULL NAME: Aircraft Manufacturing Company De Havilland D.H.2

GREAT BRITAIN — POINT VALUE: (24) 18-9-5-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-5	6	1	5	2	+2	9	0	1	2	3	1	2	2	4	4	6	3	7
101-200	1-2	3-4	5-6	1	6	2	+2	10	0	1	2	3	1	2	2	4	4	7	3	7
201-300	1-3	4	5-6	1	5	1	+2	10	0	1	2	4	1	2	2	4	4	7	3	7
301-400	1-3	4	5-7	1	5	1	+2	10	1	2	2	4	1	2	2	4	4	7	4	7
401-500	1-3	4	5-7	1	5	1/2	+2	11	1	2	2	4	1	3	2	5	5	8	4	8
501-600	1-3	4	5-7	1	5	1/5	+3	11	1	2	3	4	2	3	3	5	5	8	4	8
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-1	+1	+2	+1	+2	+1	+2	+2	P	P	P	P	P

NOTES: Introduced in late 1915. About 400 were built. Used by Britain. Primarily used as a fighter. Nicknamed the "Spinning Incinerator" and the "De Havilland Scout".

28 SOPWITH 1½-STRUTTER (110 hp Le Rhone)

FULL NAME: Sopwith Aviation Company 1 1/2 Strutter

GREAT BRITAIN — POINT VALUE: (27) 30-15-8-4

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	1	6	2(2)	+1	11	1	2	4	6	4	7	5	9	6	10	5	7
101-200	1-2	3-5	6	1	6	2(2)	+1	11	1	2	4	6	4	7	5	9	6	10	5	7
201-300	1-2	3-4	5-6	1	6	1(2)	+2	12	1	2	4	7	4	7	5	9	7	10	6	7
301-400	1-2	3-4	5-7	1	6	1(1)	+2	12	1	2	4	7	5	8	6	10	7	11	6	8
401-500	1-2	3-4	5-7	1	6	1(1)	+2	12	1	2	4	7	5	8	6	10	7	11	6	8
501-600	1-2	3-4	5-7	1	6	1/4(1/3)	+2	13	1	2	4	7	5	9	6	11	7	11	6	8
601-700	1-3	4	5-7	1	6	1/7(1/6)	+2	13	1	2	4	7	5	9	6	11	7	12	6	8
701-710	1-3	4	5-8	1	5	1/12(1/9)	+2	13	1	2	5	8	5	9	6	11	8	12	7	9
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-2	+1	+2	+2	+3	+2	+4	+3	P	P	P	P	P

NOTES: Introduced in early 1916. Few British-built with this engine, but 4,500 contract-built in France (late 1916-Sopwith 1 A. 2 and Sopwith 1 B. 2). Used by Britain, France, Belgium, Russia, and the United States (training, only). Primarily used for reconnaissance and as a two-seat fighter. Nicknamed the "Strutter".

30 F.E. 2b (160 hp Beardmore)

FULL NAME: Royal Aircraft Factory Farman Experimental F.E. 2b

GREAT BRITAIN — POINT VALUE: (22) 34-17-9-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-5	6	1	6	1(2)	+1	7	1	2	3	4	3	4	4	6	7	8	5	7
101-200	1-2	3-4	5-6	1	6	1(1)	+1	7	1	2	3	4	3	4	4	6	7	9	6	8
201-300	1-3	4	5-6	1	6	1(1)	+1	7	1	2	3	4	3	4	4	6	7	9	6	8
301-400	1-3	4	5-6	1	6	1/2(1)	+1	8	1	2	3	5	3	4	4	6	7	9	6	9
401-500	1-3	4	5-6	1	6	1/4(1/3)	+1	8	1	2	3	5	3	4	4	6	8	10	7	9
501-520	1-3	4	5-6	1	6	1/9(1/6)	+1	8	2	3	3	5	3	5	4	6	8	10	7	9
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-1	+1	+2	+2	+2	+1	+2	+2	P	P	P	P	P

NOTES: Introduced in early 1916. About 1,700 were built with this engine. Used by Britain. Primarily used as a fighter, for ground attack, reconnaissance, and as a bomber. Nicknamed "Fee". The Home Defense Variant was nicknamed the "Chinese Scout".

32 B.E.2e (90 hp R.A.F. 1a)

FULL NAME: Royal Aircraft Factory Bleriot Experimental B.E. 2e

GREAT BRITAIN — POINT VALUE: (16) 30-15-8-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-4	5	1	4	2(1)	+1	7	1	2	3	4	5	6	6	8	7	9	7	8
101-200	1-2	3-4	5	1	4	1(1)	+1	7	1	2	3	4	5	6	6	8	7	9	7	8
201-300	1-2	3-4	5	1	4	1/3(1/4)	+1	7	1	2	3	4	5	6	6	8	7	9	7	9
301-400	1-2	3-4	5-6	1	4	1/6(1/7)	+1	8	1	2	3	5	5	6	6	8	8	10	8	9
401-480	1-3	4	5-6	1	4	1/9(1/15)	+1	8	1	2	4	5	5	6	7	8	8	10	8	9
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-2	P	-2	+1	+3	+2	+3	+1	P	P	P	P	P	P	P

NOTES: Introduced in mid 1916. 1,801 were built. Used by Britain, Belgium, and Russia. Primarily used for reconnaissance. Nicknamed "Quirk".

35 SOPWITH PUP (80 hp Le Rhone 9C)

FULL NAME: Sopwith Aviation Company "Pup"

GREAT BRITAIN — POINT VALUE: (26) 17-9-4-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/3		+1/3												
1-100	1-2	3-5	6-7	1	5	3(3)	+2(2)	13	0	1	2	3	2	3	3	5	4	5	2	3
101-200	1-2	3-5	6-7	1	5	2(2)	+2(2)	13	0	1	2	3	2	3	3	5	4	5	2	3
201-300	1-2	3-5	6-7	1	5	2(1)	+2(2)	14	0	1	2	3	2	3	3	5	4	5	2	3
301-400	1-2	3-5	6-8	1	5	1(1/2)	+3(2)	15	0	1	2	3	2	4	3	6	4	6	2	3
401-500	1-2	3-5	6-8	1	5	1(1/2)	+3(2)	15	0	1	2	3	2	4	3	6	4	6	2	3
501-600	1-3	4-5	6-8	1	5	1(1/3)	+3(2)	16	0	1	2	3	3	4	4	6	4	6	2	3
601-700	1-3	4	5-8	1	5	1/3(1/5)	+3(3)	16	0	1	2	3	3	4	4	6	5	6	2	3
701-800	1-3	4	5-9	1	4	1/20(—)	+4(—)	17	0	1	3	4	3	4	4	6	5	7	2	3
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1(-2)	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1916. About 1,770 were built. Used by Britain. Primarily used as a fighter.

36 R.E. 8 (150 hp R.A.F. 4a)

FULL NAME: Royal Aircraft Factory Reconnaissance Experimental R.E.8

GREAT BRITAIN — POINT VALUE: (26) 33-17-8-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	1	5	2	+1	7	1	2	4	5	4	5	5	7	7	10	7	X
101-200	1-3	4-5	6	1	5	1	+1	8	1	3	4	5	4	6	5	8	7	10	7	X
201-300	1-3	4-5	6	1	5	1	+1	8	2	3	4	6	4	6	5	8	7	10	7	X
301-400	1-3	4-5	6	1	5	1	+1	8	2	3	4	6	5	6	6	8	7	11	8	X
401-500	1-3	4-5	6-7	1	5	1/2	+1	8	2	3	4	6	5	7	6	9	8	11	8	X
501-600	1-3	4	5-7	1	5	1/6	+1	9	2	3	4	6	5	7	6	9	8	12	8	X
601-620	1-3	4	5-7	1	5	1/20	+1	9	2	3	4	6	5	7	6	9	8	12	8	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in late 1916. About 4,000 were built. Used by Britain and Belgium. Primarily used for reconnaissance and as a bomber. Nicknamed "Harry Tate".

38 AIRCO D.H.4 (250 hp Rolls Royce Eagle III)

FULL NAME: Aircraft Manufacturing Company De Havilland D.H.4

GREAT BRITAIN — POINT VALUE: (30) 37-19-9-5

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-6	7	2	5	2	+2	8	1	2	3	5	5	7	6	9	7	11	5	6
101-200	1-2	3-6	7	2	5	2	+2	9	1	2	3	6	5	8	6	10	7	11	5	7
201-300	1-3	4-6	7	2	5	2	+3	9	1	3	3	6	5	8	6	10	7	11	5	7
301-400	1-3	4-6	7	1	5	1	+3	10	2	3	4	6	6	8	7	10	8	12	5	8
401-500	1-3	4-5	6-8	1	4	1	+3	10	2	3	4	6	6	9	7	11	8	12	5	8
501-600	1-3	4-5	6-8	1	4	1/2	+3	10	2	3	4	7	6	9	7	11	8	13	6	8
601-700	1-3	4-5	6-8	1	4	1/3	+3	11	2	3	4	7	6	10	7	12	9	13	6	9
701-800	1-4	5	6-8	1	4	1/9	+4	11	2	3	4	7	7	10	8	12	9	14	6	9
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-2	0	0	-1	P	-3	+1	+2	+2	+3	+2	+4	P	P	P	P	P	P

NOTES: Introduced in early 1917. 1,449 were built in Britain. Used by Britain. Primarily used for reconnaissance and as a bomber.

41 S.E.5a (200 hp Wolseley W. 4a Viper)

FULL NAME: Royal Aircraft Factory Santos (or Scout) Experimental S.E. 5a

GREAT BRITAIN — POINT VALUE: (33) 24-12-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/1		+1/3												
1-100	1-2	3-7	8	3	5	3(3)	+3(3)	16	0	1	3	6	3	7	4	10	5	9	3	4
101-200	1-3	4-7	8	3	5	3(3)	+3(3)	17	0	1	3	6	3	8	4	10	5	10	3	4
201-300	1-3	4-6	7-9	3	5	2(2)	+3(3)	17	0	1	3	7	3	8	4	10	5	10	3	5
301-400	1-3	4-6	7-9	2	4	2(2)	+4(3)	18	0	1	3	7	3	8	4	10	6	10	3	5
401-500	1-3	4-6	7-9	2	4	2(1)	+4(3)	18	0	1	3	7	3	9	4	11	6	11	3	5
501-600	1-3	4-6	7-9	2	4	1(1)	+4(4)	19	0	1	3	7	4	9	5	11	6	11	3	5
601-700	1-3	4-6	7-10	2	4	1/2(1/4)	+5(4)	20	0	1	3	8	4	10	5	12	6	12	3	6
701-800	1-4	5-6	7-10	2	4	1/3(1/9)	+5(4)	21	0	2	4	8	4	10	5	12	6	12	3	6
801-850	1-4	5	6-10	1	4	1/16(—)	+5(—)	22	1	2	4	8	4	11	5	13	7	13	4	6
(OP) LOADED	+1	-1	-1	0	0	-1	P	-3	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1917. Available in quantity in early 1918. About 5,128 S.E. 5a's were built. Used by Britain and the United States. Primarily used as a fighter. Essentially similar to the 200 hp Hispano-Suiza version.

42 BRISTOL F.2B (275 hp Rolls Royce Falcon III)

FULL NAME: British and Colonial Aeroplane Company F.2B

GREAT BRITAIN — POINT VALUE: (35) 36-18-9-5

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-6	7	3	4	3(3)	+2	12	0	1	3	5	3	6	4	8	5	9	3	5
101-200	1-2	3-6	7	2	4	3(2)	+2	13	0	1	3	5	3	6	4	8	5	9	3	5
201-300	1-2	3-6	7-8	2	4	2(2)	+2	13	1	2	3	5	4	6	5	8	6	9	3	5
301-400	1-2	3-6	7-8	2	4	2(2)	+2	14	1	2	3	6	4	6	5	8	6	9	3	5
401-500	1-3	4-6	7-8	2	4	2(1)	+3	14	1	2	3	6	4	6	5	8	6	10	4	6
501-600	1-3	4-5	6-8	2	4	1(1)	+3	15	1	2	3	6	4	7	5	8	6	10	4	6
601-700	1-3	4-5	6-9	2	4	1(1/2)	+3	15	1	2	4	6	4	7	5	9	7	11	4	6
701-800	1-3	4-5	6-9	1	3	1/4(1/5)	+4	16	1	2	4	7	5	8	6	10	7	11	4	6
801-860	1-4	5	6-9	1	3	1/11(—)	+4	17	1	2	4	7	5	8	6	10	7	11	4	6
(OP) LOADED	+1	0	-1	0	0	-1	P	-3	+1	+2	+2	+3	+2	+4	+3	P	P	P	P	P

NOTES: Introduced in mid 1917. About 3,100 were built during the war. Used by Britain. Primarily used as a two-seat fighter, for reconnaissance, and for ground attacks. Nicknamed "Bristol Fighter", "Bristol Two-Seater", "Brisfit", "Biff", and "Biffy".

45 SOPWITH F.1 Camel (130 hp Clerget)

FULL NAME: Sopwith Aviation Company F.1 Camel

GREAT BRITAIN — POINT VALUE: (34) 20-10-5-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-6	7	2	5	3	+3	15	0(0)	1(1)	2(1)	3(2)	1	3	2	5	3	7	3(2)	5(4)
101-200	1-2	3-6	7-8	2	5	3	+3	15	0(0)	1(1)	2(1)	3(2)	1	3	2	5	3	7	3(2)	6(4)
201-300	1-2	3-6	7-8	2	5	3	+3	16	0(0)	1(1)	2(1)	4(2)	1	3	2	5	3	8	3(2)	6(4)
301-400	1-2	3-6	7-8	2	4	2	+4	16	0(0)	1(1)	2(1)	4(3)	1	4	2	6	3	8	3(2)	6(4)
401-500	1-3	4-5	6-9	2	4	2	+4	17	1(0)	2(1)	2(1)	4(3)	1	4	2	6	3	8	3(2)	6(4)
501-600	1-3	4-5	6-9	1	4	1	+4	18	1(0)	2(1)	2(1)	4(3)	2	4	2	6	4	9	3(2)	7(5)
601-700	1-3	4-5	6-9	1	4	1	+5	19	1(0)	2(1)	2(1)	4(3)	2	4	2	6	4	9	4(2)	7(5)
701-800	1-4	5	6-10	1	4	1/4	+5	19	1(0)	2(1)	2(1)	4(3)	2	5	3	7	4	9	4(3)	7(5)
801-880	1-4	5	6-10	1	4	1/8	+5	20	1(0)	2(1)	2(1)	5(4)	2	5	3	7	4	10	4(3)	7(5)
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1917. A total of 5,490 F. 1 Camels were built. Used by Britain, Belgium, and the United States. Primarily used as a fighter. Model with this engine was the most common.

48 HANDLEY PAGE 0/400 (360 hp Rolls Royce Eagle VIII)

FULL NAME: Handley Page Company 0/400

GREAT BRITAIN — POINT VALUE: (55) 91-45-23-11

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	1	6	2	+1	7	2	3	4	6	4	7	X	X	X	X	X	X
101-200	1-3	4-5	6	1	6	1	+1	8	2	4	4	6	4	8	X	X	X	X	X	X
201-300	1-3	4-5	6	1	6	1	+1	8	2	4	4	7	5	8	X	X	X	X	X	X
301-400	1-3	4-5	6-7	1	5	1	+1	8	3	4	4	7	5	8	X	X	X	X	X	X
401-500	1-3	4	6-7	1	5	1/7	+1	8	3	4	4	7	5	9	X	X	X	X	X	X
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
401-460	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-2	+1	+2	+2	P	+1	P	P	P	P	P	P	P

NOTES: Introduced in late 1917. About 500 were built. Used by Britain. Primarily used as a bomber.

49 AIRCO D.H.9 (230 hp B.H.P. Siddeley Puma)

FULL NAME: Aircraft Manufacturing Company De Havilland D.H.9

GREAT BRITAIN — POINT VALUE: (29) 36-18-9-5

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-6	7	2	5	2	+2	8	1	2	3	6	5	8	6	10	7	11	5	7
101-200	1-2	3-6	7	1	5	2	+2	9	1	2	3	6	5	8	6	10	7	11	5	7
201-300	1-3	4-5	6-7	1	5	2	+3	9	1	3	3	6	5	8	6	10	8	11	5	7
301-400	1-3	4-5	6-7	1	5	1	+3	10	2	3	4	6	6	8	7	10	8	12	5	8
401-500	1-3	4-5	6-8	1	4	1	+3	10	2	3	4	6	6	9	7	11	8	12	6	8
501-600	1-3	4-5	6-8	1	4	1/2	+3	10	2	3	4	7	6	9	7	11	9	13	6	8
601-700	1-4	5	6-8	1	4	1/4	+3	11	2	3	4	7	6	10	7	12	9	13	6	9
701-760	1-4	5	6-8	1	4	1/15	+4	11	3	4	4	7	7	10	8	12	9	14	6	9
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-3	+1	+2	+2	+3	+2	+4	P	P	P	P	P	P

NOTES: Introduced in late 1917. 3,204 were built by the end of 1918. Used by Britain, Belgium, and the United States. Primarily used as a bomber.

50 SOPWITH DOLPHIN (200 hp Hispano Suiza)

FULL NAME: Sopwith Aviation Company 5F.I Dolphin MK.I

GREAT BRITAIN — POINT VALUE: (32) 24-12-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/1		+1/3												
1-100	1-2	3-7	8	3	5	3(3)	+3(3)	14	1	2	3	5	3	5	4	8	6	9	4	7
101-200	1-2	3-7	8	3	5	3(2)	+3(3)	15	1	2	3	5	3	6	4	8	6	10	4	7
201-300	1-2	3-7	8	2	5	2(2)	+3(3)	15	1	2	3	5	3	6	4	8	6	10	4	7
301-400	1-3	4-6	7-8	2	5	2(2)	+3(3)	16	1	2	3	6	4	6	5	8	7	11	5	8
401-500	1-3	4-6	7-8	2	5	2(1)	+4(3)	17	1	2	3	6	4	7	5	9	7	11	5	8
501-600	1-3	4-6	7-9	2	4	1(1)	+4(3)	17	1	2	3	6	4	7	5	9	7	11	5	8
601-700	1-3	4-6	7-9	2	4	1(1)	+4(4)	18	1	2	3	6	4	7	5	9	7	12	5	8
701-800	1-4	5-6	7-9	2	4	1/2(1/3)	+5(4)	19	1	3	3	7	5	8	6	10	8	12	5	9
801-920	1-4	5	6-9	1	4	1/4(1/8)	+5(4)	20	1	3	4	7	5	8	6	11	8	13	6	9
(OP) LOADED	+1	-1	-1	0	0	-1	P	-2	+1	+1	+1	+2	+1	+3	+2	+3	P	P	P(+3)	P(+5)

NOTES: Introduced in early 1918. 1,532 were built, used by Britain. Primarily used as a fighter and for ground attack. Nicknamed "The Blockbuster". Most carried only the A Guns (standard Points), but some carried one or both of the C Guns. (POINTS: 1C Gun: (34) ; 2C Guns: (33)).

54 POMILIO PE (260 hp Fiat A-12)

FULL NAME: Fabbrica Aeroplani Ing. O. Pomilio & Compagnia PE

ITALY — POINT VALUE: (29) 38-19-9-5

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-6	7	2	5	2(2)	+2	9	1	2	2	4	3	6	4	8	6	10	6	7
101-200	1-2	3-6	7	2	5	2(2)	+2	9	1	2	2	4	3	6	4	8	6	10	6	7
201-300	1-2	3-6	7	1	5	2(1)	+2	9	1	2	3	4	3	6	4	8	6	10	6	8
301-400	1-3	4-5	6-8	1	4	1(1)	+2	10	2	3	3	5	3	6	4	8	6	10	7	8
401-500	1-3	4-5	6-8	1	4	1(1)	+2	10	2	3	3	5	3	6	4	8	6	11	7	8
501-600	1-3	4-5	6-8	1	4	1/3(1/4)	+3	11	2	3	3	5	4	7	5	9	6	11	7	9
601-700	1-3	4	5-8	1	4	1/7(1/8)	+3	11	2	3	3	5	4	7	5	9	7	12	7	9
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-3	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in early 1918. About, 1,000 were built. Very similar was the Pomilio PD (introduced in mid 1917, about 500 built). Primarily used for reconnaissance and as a bomber.

53 CAPRONI Ca.3 (150 hp Isotta-Fraschini V. 4b)

FULL NAME: Societe d'Aviazione Ing. Caproni Ca.3

ITALY — POINT VALUE: (33) 74-37-18-9

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-5	6	1	6	1(1)	+1	6	2	3	4	6	3	5	X	X	X	X	X	X
101-200	1-2	3-5	6	1	6	1(1)	+1	6	2	3	4	6	3	5	X	X	X	X	X	X
201-300	1-2	3-4	5-6	1	6	1(1)	+1	7	2	3	4	6	3	5	X	X	X	X	X	X
301-400	1-2	3-4	5-6	1	6	1(1/2)	+1	7	2	4	4	6	3	6	X	X	X	X	X	X
401-500	1-3	4	5-6	1	6	1/2(1/3)	+1	7	3	4	4	6	3	6	X	X	X	X	X	X
501-600	1-3	4	5-7	1	6	1/4(1/7)	+1	7	3	4	4	6	3	6	X	X	X	X	X	X
601-630	1-3	4	5-7	1	6	1/8(—)	+1	8	3	4	4	6	3	6	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1(-5)	P	-2	+1	+3	+3	P	+3	P	P	P	P	P	P	P

NOTES: Introduced in mid 1917. About 360 were built (86 in France). Used by Italy and France. Primarily used as a bomber. The postwar designation was changed to Ca.33.

56 S.V.A. 5 (220 hp S.P.A. Type 6)

Societa Giovanni Ansaldo

FULL NAME: Savoia-Verduzio-Ansaldo (S.V.A.) 5

ITALY — POINT VALUE: (32) 23-12-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-7	8	3(3)	5	5(3)	+3(2)	15	1(1)	2(3)	3	5	3	6	5	8	6	9	4(5)	6(7)
101-200	1-2	3-7	8	3(2)	5	4(3)	+3(2)	15	1(1)	2(3)	3	5	3	6	5	8	6	10	4(5)	6(7)
201-300	1-3	4-7	8	3(2)	5	3(2)	+3(2)	16	1(1)	2(3)	3	6	4	6	5	8	6	10	4(5)	6(7)
301-400	1-3	4-7	8	2(2)	4	3(2)	+4(2)	17	1(2)	2(3)	3	6	4	7	5	9	6	10	4(5)	7(8)
401-500	1-3	4-7	8-9	2(2)	4	2(1)	+4(3)	17	1(2)	2(3)	3	6	4	7	5	9	6	11	4(5)	7(8)
501-600	1-3	4-6	7-9	2(2)	4	2(1)	+4(3)	18	1(2)	2(4)	4	6	4	8	5	10	7	11	5(6)	7(8)
601-700	1-3	4-6	7-9	2(1)	4	1(1/2)	+5(3)	19	1(2)	2(4)	4	7	5	8	6	10	7	12	5(6)	8(9)
701-800	1-3	4-6	7-9	2(1)	4	1(1/3)	+5(3)	20	1(3)	2(4)	4	7	5	8	6	10	8	12	5(6)	8(9)
801-920	1-4	5	6-9	1(—)	4	1/3(—)	+5(—)	20	2(—)	3(—)	4	7	5	9	6	11	8	12	5(—)	8(—)
(OP) LOADED	+1	-1	-1	0	0	-1	P	-3	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in early 1918. Over 1,000 were built. Used by Italy. Used for reconnaissance and as a fighter. Nicknamed "Primo".

60 AVIATIK C.I (160 hp Mercedes D.III)

FULL NAME: Automobil und Aviatik C.I

GERMANY — POINT VALUE: (18) 32-16-8-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-4	5	1	4	1	+1	7	1	2	2	3	3	4	4	6	5	7	5	6
101-200	1-3	4	5-6	1	4	1	+1	7	1	2	2	3	3	4	4	6	5	7	5	6
201-300	1-3	4	5-6	1	4	1	+1	8	1	2	3	4	3	4	4	6	5	7	5	6
301-400	1-3	4	5-6	1	4	1/2	+1	8	1	2	3	4	3	5	5	6	6	8	5	7
401-500	1-3	4	5-6	1	4	1/3	+1	8	1	2	3	4	3	5	5	7	6	8	6	7
501-520	1-3	4	5-6	1	4	1/6	+1	8	2	3	3	4	3	5	5	7	6	8	6	7
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-2	+1	+2	+1	+2	+2	+3	P	P	P	P	P	P

NOTES: Introduced in early 1915. Used by Germany. Very similar to the Austrian Aviatik B.III-series 34. Primarily used for reconnaissance.

61 FOKKER E.III (100 hp Oberursel)

FULL NAME: Fokker Flugzeug-Werke Eindecker III

GERMANY — POINT VALUE: (20) 18-9-5-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-4	5-6	1	5	2	+1	10	1	2	2	5	3	5	5	7	5	8	5	8
101-200	1-2	3-4	5-6	1	5	1	+1	11	1	2	2	5	4	5	5	7	6	8	5	8
201-300	1-2	3-4	5-6	1	5	1	+1	11	1	2	3	5	4	6	5	8	6	9	5	8
301-400	1-3	4	5-6	1	5	1/2	+2	12	2	3	3	5	4	6	5	8	6	10	6	9
401-480	1-3	4	5-7	1	5	1/5	+2	12	2	3	3	5	4	6	5	8	6	10	6	9
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	0	-1	+1	+1	+1	+1	+1	+2	+2	P	+2	+3	+1	P

NOTES: Introduced in late 1915. The very similar Fokker E. II was introduced in mid 1915. About 23-50 E. IIs and 150-260 E. IIIs were built. Used by Germany and Austria-Hungary. Primarily used as a fighter.

63 ALBATROS C.III (160 hp Mercedes D.III)

FULL NAME: Albatros Flugzeug-Werke C. III

GERMANY — POINT VALUE: (19) 33-16-8-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-4	5	1	6	1(1)	+1	7	1	2	3	5	4	5	5	7	6	9	6	8
101-200	1-2	3-4	5-6	1	6	1(1/2)	+1	8	1	2	3	5	4	5	5	7	7	10	6	8
201-300	1-3	4	5-6	1	6	1/2(1/2)	+1	8	1	2	3	5	4	6	5	8	7	10	6	9
301-400	1-3	4	5-6	1	5	1/3(1/8)	+1	8	1	2	3	5	4	6	5	8	7	10	6	9
401-500	1-3	4	5-6	1	5	1/4(—)	+1	8	1	2	4	5	4	6	5	8	7	11	7	9
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-1	+1	+2	+1	+2	+2	+3	P	P	P	P	P	P

NOTES: Introduced in early 1916. Used by Germany and Austria-Hungary. Primarily used for reconnaissance.

67 RUMPLER 6BI (160 hp Mercedes D.III)

FULL NAME: E. Rumpler Flugzeug-Werke 6B 1

GERMANY — POINT VALUE: (22) 23-11-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-2	3-5	6	1	5	1	+1	9	1	2	3	4	4	5	5	7	6	8	5	7
101-200	1-3	4-5	6	1	5	1	+1	10	1	2	3	4	4	5	5	7	6	9	5	8
201-300	1-3	4	5-6	1	5	1	+1	10	1	2	3	4	4	6	5	8	6	9	6	8
301-400	1-3	4	5-6	1	5	1/2	+1	11	1	2	3	5	4	6	5	8	6	9	6	8
401-500	1-3	4	5-7	1	5	1/2	+1	11	1	2	3	5	5	6	6	8	7	10	6	9
501-600	1-3	4	5-7	1	4	1/4	+1	12	1	2	3	5	5	7	6	9	7	10	6	9
601-690	1-3	4	5-7	1	4	1/16	+2	12	2	3	3	5	5	7	6	9	7	11	6	9
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in mid 1916. 38 were built. The Rumpler 6B 2 (introduced in mid 1917 - 50 built) was very similar. Primarily used as a fighter and for maritime reconnaissance.

68 ALBATROS D.II

FULL NAME: Albatros Flugzeug-Werke Doppeldecker D. II

GERMANY — POINT VALUE: (29) 22-11-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-5	6	2(2)	5	3(3)	+2	13	0	2	3	4	3	4	4	6	5	6	3	4
101-200	1-2	3-5	6-7	1(2)	5	2(3)	+2	14	0	2	3	4	3	4	4	6	5	7	3	4
201-300	1-3	4-5	6-8	1(1)	5	2(2)	+2	14	0	2	3	4	3	4	4	6	5	7	3	4
301-400	1-3	4-5	6-8	1(1)	5	2(2)	+2	15	1	2	3	4	3	4	4	6	5	7	3	4
401-500	1-3	4-5	6-8	1(1)	5	1(1)	+3	15	1	2	3	4	4	5	4	6	6	7	4	5
501-600	1-3	4	5-9	1(1)	4	1(1)	+3	16	1	2	3	5	4	5	5	7	6	8	4	5
601-700	1-3	4	5-9	1(1)	4	1/3(1/3)	+3	16	1	2	3	5	4	5	5	7	6	8	4	5
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTES: The Albatros D.I was very similar in performance. The D.I introduced in mid 1916, the D.II in late 1916. About 50 D.Is and 275 D.IIs were built. Used by Germany, Austria-Hungary built and used the similar Oeffag-Albatros D.II (185 hp Austro-Daimler). Primarily used as a fighter.

70 D.F.W. C.V. (200 hp Benz Bz IV)

FULL NAME: Deutsche Flugzeug-Werke C.V.

GERMANY — POINT VALUE: (28) 35-18-9-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	1	5	2	+1	7	1	2	3	4	4	6	6	8	6	10	4	X
101-200	1-2	3-5	6	1	5	2	+1	8	1	3	3	5	5	6	6	8	7	10	4	X
201-300	1-2	3-5	6	1	5	1	+1	8	1	3	3	5	5	6	6	8	7	11	5	X
301-400	1-3	4-5	6-7	1	5	1	+2	9	1	3	3	5	5	7	6	9	7	11	5	X
401-500	1-3	4	5-7	1	5	1	+2	9	1	3	3	5	5	7	6	9	7	11	6	X
501-600	1-3	4	5-7	1	4	1/2	+2	9	2	3	3	5	5	7	6	9	8	12	6	X
601-700	1-3	4	5-7	1	4	1/3	+2	10	2	3	4	6	6	8	7	10	8	12	6	X
701-800	1-3	4	5-8	1	4	1/8	+2	10	2	4	4	6	6	8	7	10	9	13	6	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in late 1916. Used by Germany. Primarily used for reconnaissance. Machines built by Aviatik were identical, but designated Aviatik Av. C.VI.

72 ALBATROS D.III (160 hp Mercedes D. IIIa)

FULL NAME: Albatros Flugzeug-Werke Doppeldecker D. III

GERMANY — POINT VALUE: (30) 23-11-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-6	7	2	4	3(3)	+2	12	0	1	3	5	1	3	2	5	4	7	3	4
101-200	1-2	3-5	6-7	2	4	2(3)	+2	13	0	1	3	5	1	3	2	5	4	7	3	4
201-300	1-3	4-5	6-8	1	4	2(2)	+2	13	0	1	3	5	2	3	2	5	4	7	3	4
301-400	1-3	4-5	6-8	1	4	2(2)	+2	14	0	1	3	5	2	4	3	6	4	7	4	5
401-500	1-3	4-5	6-8	1	3	1(1)	+2	14	0	1	3	5	2	4	3	6	4	7	4	5
501-600	1-3	4	5-9	1	3	1(1)	+3	15	1	2	3	5	2	4	3	6	4	8	4	5
601-700	1-3	4	5-9	1	3	1/3(1/3)	+3	15	1	2	3	6	2	4	3	6	4	8	4	5
701-720	1-3	4	5-9	1	3	1/9(1/8)	+3	16	1	2	4	6	2	4	3	6	4	8	4	6
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in early 1917. 1,340 were built. Used by Germany. Austria-Hungary built and used the similar Oeffag-Albatros D.III - series 153 (185 hp Austro-Daimler). Primarily used as a fighter. Nicknamed "Albatros Vee-Strutter".

73 GOTHA G.IV (260 hp Mercedes D. IVa)

FULL NAME: Gothaer Waggonfabrik Grosskampfflugzeug G. IV

GERMANY — POINT VALUE: (36) 65-33-16-8

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	1	6	2	+1	6	2	3	4	6	4	8	X	X	X	X	X	X
101-200	1-2	3-5	6	1	6	2	+1	7	2	3	4	6	4	8	X	X	X	X	X	X
201-300	1-2	3-4	5-6	1	5	1	+1	7	2	4	4	6	4	8	X	X	X	X	X	X
301-400	1-2	3-4	5-6	1	5	1	+1	7	3	4	4	6	5	8	X	X	X	X	X	X
401-500	1-2	3-4	5-6	1	5	1	+2	7	3	4	4	6	5	8	X	X	X	X	X	X
501-600	1-2	3-4	5-7	1	5	1	+2	8	3	4	4	6	5	9	X	X	X	X	X	X
601-700	1-3	4	5-7	1	5	1/2	+2	8	3	4	5	7	5	9	X	X	X	X	X	X
701-800	1-3	4	5-7	1	5	1/6	+2	8	4	5	5	7	5	10	X	X	X	X	X	X
801-860	1-3	4	5-7	1	5	1/15	+2	8	4	5	5	7	6	10	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+1	+2	P	+2	P	P	P	P	P	P	P

NOTES: Introduced in early 1917. About 230 were built. Used by Germany and Austria-Hungary. The Gotha G. V (mid 1917 - used only by Germany) was very similar. Primarily used as a bomber. Gross Kampfflugzeug means "Large Battle Plane". Nicknamed "Gothas".

74 HALBERSTADT CL.II (160 hp Mercedes D.III)

FULL NAME: Halberstadter Flugzeug-Werke CL. II

GERMANY — POINT VALUE: (32) 33-17-8-4

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-5	6-7	1	5	2(2)	+2	10	0	2	3	5	4	6	5	8	6	9	3	5
101-200	1-2	3-5	6-7	1	5	2(1)	+2	10	1	2	3	6	4	6	5	8	7	9	3	5
201-300	1-3	4-5	6-7	1	5	1(1)	+2	11	1	2	3	6	4	7	5	9	7	9	3	5
301-400	1-3	4-5	6-7	1	5	1(1)	+2	11	1	2	3	6	5	7	6	9	7	10	4	5
401-500	1-3	4-5	6-8	1	5	1(1/2)	+2	12	1	2	3	6	5	7	6	9	8	10	4	5
501-600	1-3	4-5	6-8	1	4	1/2(1/3)	+3	12	1	2	4	7	5	8	6	10	8	11	4	6
601-700	1-3	4	5-8	1	4	1/3(1/8)	+3	12	1	2	4	7	5	8	7	10	8	11	4	6
701-800	1-3	4	5-8	1	4	1/15(—)	+3	13	1	2	4	7	6	9	7	11	9	11	4	6
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-3	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1917. 900 were built. Used by Germany. Primarily used as a two-seat fighter and for ground attack.

75 FOKKER Dr.I (110 hp Thulin Le Rhone 9J)

FULL NAME: Fokker Flugzeug-Werke Dreidecker Dr. I

GERMANY — POINT VALUE: (33) 20-10-5-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/3		+1/3												
1-100	1-2	3-6	7	2(2)	5	5(4)	+2	11	0	1	2	3	1	2	2	4	3	5	2	3
101-200	1-2	3-6	7	2(2)	5	5(4)	+2	12	0	1	2	3	2	2	3	4	4	5	2	3
201-300	1-2	3-5	6-7	2(1)	5	4(4)	+2	12	0	1	2	3	2	2	3	4	4	5	2	3
301-400	1-2	3-5	6-7	2(1)	5	4(3)	+2	13	0	1	2	3	2	3	3	5	4	6	2	3
401-500	1-3	4-5	6-7	1(1)	5	3(2)	+3	13	0	1	2	3	2	3	3	5	4	6	2	3
501-600	1-3	4-5	6-7	1(1)	5	1(1)	+3	14	0	1	2	3	2	3	3	5	4	6	2	3
601-700	1-3	4	5-8	1(1)	4	1/2(1/3)	+3	14	0	1	2	3	2	3	3	5	5	6	2	3
701-780	1-3	4	5-8	1(1)	4	1/8(1/12)	+3	15	0	1	2	4	2	3	3	5	5	7	3	4
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-2	P	-3	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1917. About 320 were built, with various engines. Thulin-engined planes were flown by top aces. Most planes had the 110 hp Oberursel UR III engine. Used by Germany. Primarily used as a fighter. Nicknames "Fokker Triplane" and "Tripe".

77 ZEPPELIN STAAKEN R.VI (245 hp Maybach Mb IV)

FULL NAME: Zeppelin Flugzeugwerft Staaken Riesenflugzeug R. VI

GERMANY — POINT VALUE: (59) 170-85-42-21

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-3	4-5	6	1	6	2	+1	6	2	3	5	7	6	9	X	X	X	X	X	X
101-200	1-3	4	5-6	1	6	1	+1	7	2	3	5	7	6	9	X	X	X	X	X	X
201-300	1-3	4	5-6	1	6	1	+1	7	2	3	5	7	7	9	X	X	X	X	X	X
301-400	1-3	4	5-6	1	6	1	+1	7	3	4	5	7	7	9	X	X	X	X	X	X
401-500	1-3	4	5-6	1	6	1/5	+1	7	3	4	5	8	7	10	X	X	X	X	X	X
501-600	1-3	4	5-7	1	6	1/8	+1	8	3	4	5	8	7	10	X	X	X	X	X	X
601-640	1-3	4	5-7	1	6	1/14	+1	8	4	5	6	8	8	10	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-2	+1	+2	+2	P	+1	P	P	P	P	P	P	P

NOTES: Introduced in mid 1917. Only 18 of this particular model were built. Used by Germany. Primarily used as a bomber. Riesenflugzeug means "Giant Airplane". Nicknamed "Giants".

78 PFALZ D.III (160 hp Mercedes D. III)

FULL NAME: Pfalz Flugzeug-Werke D. III

GERMANY — POINT VALUE: (28) 22-11-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-5	6-7	2	5	2(2)	+2(2)	15	1	2	3	5	4	5	5	7	6	10	5	7
101-200	1-3	4-5	6-8	1	5	2(1)	+3(2)	15	1	2	3	5	4	5	5	7	7	10	5	7
201-300	1-3	4-5	6-8	1	5	1(1)	+3(2)	16	1	2	3	5	4	5	5	8	7	10	5	8
301-400	1-3	4-5	6-8	1	5	1(1)	+3(2)	17	1	2	3	5	4	6	5	8	7	11	5	8
401-500	1-3	4-5	6-8	1	5	1(1/2)	+3(3)	17	1	3	3	5	4	6	5	8	7	11	6	8
501-600	1-3	4-5	6-8	1	4	1/2(1/3)	+4(3)	18	2	3	4	6	4	6	5	9	8	12	6	9
601-700	1-3	4	5-9	1	4	1/3(1/5)	+4(3)	18	2	3	4	6	5	7	6	9	8	12	6	9
701-720	1-3	4	5-9	1	4	1/8(—)	+4(3)	19	2	3	4	6	5	7	6	9	8	13	6	9
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in late 1917. About 600 were built. Used by Germany. Primarily used as a fighter.

79 RUMPLER C.VII (240 hp Maybach Mb. IV)

FULL NAME: Rumpler Flugzeug-Werke C. VII

GERMANY — POINT VALUE: (29) 36-18-9-5

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	2	5	4	+1	8	1	3	3	5	5	6	6	8	7	10	7	X
101-200	1-2	3-5	6	2	5	4	+2	8	1	3	3	5	5	6	6	8	7	11	7	X
201-300	1-2	3-5	6-7	2	5	3	+2	9	1	3	3	5	5	7	6	9	7	11	7	X
301-400	1-2	4-5	6-7	1	4	2	+2	9	2	3	3	5	5	7	6	9	8	11	7	X
401-500	1-3	4-5	6-7	1	4	2	+2	9	2	3	4	5	5	7	6	9	8	12	8	X
501-600	1-3	4-5	6-7	1	4	1	+2	10	2	3	4	6	6	8	7	10	8	12	8	X
601-700	1-3	4-5	6-8	1	4	1	+2	10	2	3	4	6	6	8	7	10	9	13	8	X
701-800	1-3	4-5	6-8	1	4	1/2	+3	11	2	4	4	6	6	9	7	10	9	13	9	X
801-1060	1-4	5	6-8	1	4	1/8	+3	11	2	4	4	7	7	10	8	11	10	14	10	X
(OP) LOADED	+1	0	-1	0	0	-2	P	-3	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in late 1917. Used by Germany. Primarily used for high altitude reconnaissance. The "Rubild" model (also called the Rumpler C.VI) was for photographic reconnaissance, and had identical performance.

80 JUNKERS J.I (200 hp Benz Bz. IV)

FULL NAME: Junkers Flugzeug-Werke J. I

GERMANY — POINT VALUE: (30) 42-21-10-5

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/1		+1/3												
1-100	1-3	4-5	6	1	6	1	+1	8	2	3	4	6	5	7	6	X	X	X	X	X
101-200	1-3	4	5-6	1	6	1/2	+1	9	2	3	4	6	6	8	7	X	X	X	X	X
201-300	1-3	4	5-6	1	6	1/4	+1	9	2	3	4	6	6	8	7	X	X	X	X	X
301-320	1-3	4	5-6	1	6	1/8	+1	10	2	3	4	6	6	9	7	X	X	X	X	X
401-500	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
501-600	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-1	+1	P	+1	P	+1	P	P	P	P	P	P	P

NOTES: Introduced in late 1917. 227 were built. Used by Germany. Primarily used for ground attack. Nicknamed "Mobelwagen" ("Furniture Van").

82 ALBATROS D.Va (200 hp Mercedes D.IIIa)

FULL NAME: Albatros Flugzeug-Werke Doppeldecker D.Va

GERMANY — POINT VALUE: (31) 24-12-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-6	7	2(2)	4	3(3)	+2	13	0	1	3	5	4	5	5	7	5	7	4	5
101-200	1-2	3-6	7	2(2)	4	3(3)	+2	14	0	1	3	5	4	5	5	7	5	8	4	5
201-300	1-3	4-6	7-8	2(2)	4	3(3)	+2	14	0	1	3	5	4	6	5	8	5	8	4	5
301-400	1-3	4-5	6-8	2(2)	4	2(2)	+2	15	0	1	3	5	4	6	5	8	6	8	4	5
401-500	1-3	4-5	6-8	2(2)	4	1(2)	+3	15	0	1	4	6	4	6	5	8	6	9	4	5
501-600	1-3	4-5	6-9	1(2)	3	1(1)	+3	16	0	1	4	6	5	7	6	9	6	9	4	6
601-700	1-3	4-5	6-9	1(1)	3	1/2(1/2)	+3	16	1	2	4	6	5	7	6	9	6	9	4	6
701-800	1-4	5	6-9	1(1)	3	1/5(1/4)	+3	17	1	3	4	6	5	8	6	10	7	10	4	6
801-820	1-4	5	6-9	1(1)	3	1/8(1/7)	+3	18	1	3	4	7	5	8	6	10	7	10	4	6
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in early 1918. 1,662 were built. Used by Germany. Austria-Hungary used the similar Oeffag-Albatros D.III - series 253 (introduced in mid 1918 - 225 hp Austro-Daimler). Primarily used as a fighter. Nicknamed "Albatros Vee-Strutter" and "Albatri".

84 L.V.G. C.VI (200 hp Benz Bz IV)

FULL NAME: Luft-Verkehrs Gesellschaft C. VI

GERMANY — POINT VALUE: (30) 35-17-9-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6-8	2	5	3	+1	11	1	2	3	5	4	6	6	8	6	8	5	7
101-200	1-2	3-5	6-8	1	5	2	+1	11	1	2	3	5	5	6	6	8	6	9	5	7
201-300	1-2	3-5	6-8	1	5	2	+1	11	1	2	3	5	5	6	6	8	6	9	5	7
301-400	1-3	4-5	6-8	1	5	1	+1	12	1	2	3	5	5	7	6	9	6	9	5	7
401-500	1-3	4-5	6-9	1	5	1	+1	12	1	2	3	5	5	7	6	9	6	10	5	8
501-600	1-3	4-5	6-9	1	4	1	+2	12	1	2	3	5	5	7	6	9	6	10	5	8
601-700	1-3	4	5-9	1	4	1	+2	13	1	2	4	6	6	8	7	10	7	10	5	8
701-800	1-3	4	5-9	1	4	1/3	+2	13	1	2	4	6	6	8	7	10	7	11	6	9
801-850	1-3	4	5-9	1	4	1/12	+2	14	2	3	4	6	6	9	7	11	8	11	6	9
(OP) LOADED	0	-1	-2	0	0	-1(-2)	P	-2	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in early 1918. About 1,000 were built. Used by Germany. Primarily used for reconnaissance.

86 FOKKER D.VIIF (185hp B.M.W. III a)

FULL NAME: Fokker Flugzeug-Werke Doppeldecker D.VII F

GERMANY — POINT VALUE: (33) 24-12-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-6	7	3	5	4	+3	14	0	1	3	5	4	5	5	8	6	8	2	4
101-200	1-2	3-6	7	3	5	4	+3	15	0	1	3	5	4	6	5	8	6	8	3	4
201-300	1-2	3-6	7-8	3	5	4	+3	15	0	1	3	5	4	6	5	8	6	8	3	4
301-400	1-2	3-6	7-8	2	5	3	+3	16	0	1	4	5	4	6	5	8	6	9	3	4
401-500	1-2	3-6	7-8	2	4	3	+4	17	0	1	4	5	4	6	5	8	6	9	3	5
501-600	1-2	3-6	7-9	2	4	2	+4	17	0	1	4	6	5	7	6	9	6	10	3	5
601-700	1-2	3-5	6-9	2	4	2	+4	18	0	1	4	6	5	7	6	9	7	10	3	5
701-800	1-3	4-5	6-9	2	4	1	+5	19	1	2	4	6	5	8	6	10	7	10	3	5
801-910	1-3	4-5	6-10	1	4	1/4	+5	19	1	2	4	7	5	8	6	10	7	11	3	5
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1918. About 950 were built with this engine. Used by Germany. Primarily used as a fighter.

93 LOHNER L (160 hp Austro-Daimler)

FULL NAME: JaKob Lohner Werke Type L

AUSTRIA-HUNGARY and ITALY — POINT VALUE: (23) 36-18-9-4

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-4	5	1	6	2	+1	7	1	2	2	3	3	4	4	6	5	6	4	5
101-200	1-2	3-4	5	1	6	1	+1	7	1	2	2	3	3	4	4	6	5	7	4	6
201-300	1-2	3-4	5	1	6	1/2	+1	7	1	2	2	3	3	5	5	7	5	7	4	6
301-400	1-2	3-4	5-6	1	5	1/4	+1	8	1	2	2	4	4	5	5	7	5	7	4	6
401-500	1-2	3-4	5-6	1	5	1/10	+1	8	1	2	3	4	4	5	5	7	5	7	4	6
401-520	1-2	3	4-6	1	5	1/20	+1	8	1	2	3	4	4	5	5	7	5	8	5	7
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-3	+1	+2	+1	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in mid 1915, about 110 L, 10 M (identical to L), and 40 R were built, used by Austria-Hungry, Mucchi L.1, an Italian copy, was very similar, Primarily used for maritime reconnaissance and as a bomber.

95 BRANDENBURG CC (185 hp Austro-Daimler)

Phonix Flugzeug-Werke Hansa und Brandenburg

FULL NAME: Camillo Castiglione CC

AUSTRIA-HUNGARY — POINT VALUE: (24) 26-13-7-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	1(2)	6	2(2)	+2	11	0	1	3	5	5	6	6	8	5	8	4	5
101-200	1-3	4-5	6-7	1(2)	6	2(2)	+2	12	0	1	3	5	5	6	6	8	6	8	4	6
201-300	1-3	4-5	6-7	1(1)	6	1(2)	+2	12	0	1	3	5	5	6	6	8	6	8	4	6
301-400	1-3	4-5	6-7	1(1)	5	1(1)	+2	13	0	1	4	5	5	6	6	9	6	9	4	6
401-500	1-3	4-5	6-8	1(1)	5	1/2(1/2)	+2	13	0	1	4	5	6	7	7	9	6	9	4	6
501-600	1-3	4	5-8	1(1)	5	1/8(1/7)	+2	14	1	2	4	6	6	8	7	9	7	10	5	7
601-700	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	-1	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	P	P	P	P	P	P

NOTES: Introduced in late 1917. 135 were built by Austria-Hungary. Designed by the German Hansa und Brandenburg firm, but the German version was far inferior. Primarily used as a fighter and for maritime reconnaissance. Also called the "Kampf Doppeldecker Wasser" and "KDW" in Austrian Service.

97 BRANDENBURG C.I (230 hp Hiero)

FULL NAME: Ufag Hansa und Brandenburg C. I series 369

AUSTRIA-HUNGARY — POINT VALUE: (30) 35-17-9-4

PLANE MOVEMENT CHARACTERISTICS CHART (ADVANCED MANEUVERS ★)

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-1	-1/2		+1/3												
1-100	1-2	3-5	6	2	5	3	+1	7	1	2	3	4	4	6	5	8	6	7	5	8
101-200	1-2	3-5	6	1	5	2	+1	8	1	2	3	4	4	6	5	8	6	7	5	8
201-300	1-3	4-5	6	1	5	2	+1	8	1	2	3	5	4	6	5	8	6	8	5	8
301-400	1-3	4-5	6	1	5	2	+1	8	1	2	3	5	4	6	5	8	6	8	5	8
401-500	1-3	4	5-6	1	5	1	+1	8	1	2	3	5	5	6	6	8	6	8	6	8
501-600	1-3	4	5-7	1	5	1	+1	9	1	2	3	5	5	6	6	9	7	9	6	9
601-700	1-3	4	5-7	1	5	1/2	+2	9	1	2	3	5	5	7	6	9	7	9	6	9
701-790	1-3	4	5-7	1	4	1/8	+2	10	1	3	4	6	5	7	6	9	7	9	7	9
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	0	0	-1	0	0	-1	P	-1	+1	P	+2	P	+1	P	P	P	P	P	P	P

NOTES: Introduced in late 1917. Designed by the German Hansa und Brandenburg firm, but only Austria-Hungary built and used the type. Primarily used for reconnaissance and as a bomber. Nicknamed the "Big Brandenburg".

98 PHONIX D.I (200 hp Hiero)

FULL NAME: Phonix Flugzeug-Werke D.I.-series 128

AUSTRIA-HUNGARY — POINT VALUE: (27) 23-11-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-6	7	2	4	3	+2	13	0	1	3	5	3	5	4	7	5	8	3	6
101-200	1-2	3-6	7	2	4	3	+2	13	0	1	3	6	3	5	4	7	5	8	3	6
201-300	1-2	3-5	6-7	2	4	2	+2	14	0	1	3	6	3	5	4	7	5	8	3	6
301-400	1-3	4-5	6-7	2	4	2	+3	15	0	1	4	6	4	6	5	8	5	8	3	6
401-500	1-3	4-5	6-7	2	4	1	+3	15	1	2	4	6	4	6	5	8	6	8	3	6
501-600	1-3	4-5	6-8	1	3	1	+3	16	1	2	4	6	4	6	5	8	6	9	3	7
601-700	1-3	4-5	6-8	1	3	1/3	+3	16	1	2	4	6	4	7	5	9	6	9	4	7
701-800	1-4	5	6-8	1	3	1/15	+3	17	1	2	4	7	4	7	5	9	6	9	4	7
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: The other series (228 and 328) and the Phonix D. II were almost identical. The D.I. was introduced in early 1918, the D.II in mid 1918. About 190 D. Is and 80 D.IIs were built. Used by Austria-Hungary. Primarily used as a fighter.

100 BERG D.I (225 hp Austro-Daimler)

Aviatik G.m.b.H. Osterreischiche-Ungarische Flugzeugfabrik Julius von Berg D.I.

AUSTRIA-HUNGARY — POINT VALUE: (33) 23-12-6-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	STALL SPEEDS	LEVEL SPEEDS	DIVE SPEEDS	POWER FACTORS	BRAKE FACTORS	CLIMB RATE	(ADV) ZOOM CLIMB	DIVE RATE	BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
					-2	-1/2		+1/3												
1-100	1-2	3-6	7	3	5	5	+3	14	0	1	3	5	3	5	5	7	5	8	3	5
101-200	1-2	3-6	7	3	4	5	+3	15	0	1	3	5	4	5	5	7	6	8	3	5
201-300	1-2	3-6	7-8	2	4	4	+3	15	0	1	3	5	4	6	5	7	6	8	3	5
301-400	1-3	4-6	7-8	2	4	3	+3	16	0	1	3	5	4	6	5	8	6	9	3	5
401-500	1-3	4-6	7-8	2	4	2	+4	17	0	1	4	6	4	6	5	8	6	9	3	5
501-600	1-3	4-6	7-9	2	4	2	+4	17	1	2	4	6	4	7	5	9	7	10	3	6
601-700	1-3	4-5	6-9	2	4	1	+4	18	1	2	4	6	5	7	6	9	7	10	4	6
701-800	1-4	5	6-9	2	3	1/2	+5	19	1	2	4	6	5	7	6	9	7	11	4	6
801-900	1-4	5	6-10	1	3	1/5	+5	20	1	2	4	6	5	8	6	10	7	11	4	6
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Model with this engine introduced in mid 1918. About 200 were built. Used by Austria-Hungary. Primarily used as a fighter.

13a SPAD 7 (150 hp Hispano-Suiza 8 Aa)

FULL NAME: Societe pour l'Aviation et ses Derives S.7

POINT VALUE: (26) 20-10-5-2

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	SPEED INCREMENTS: STALL SPEEDS	SPEED INCREMENTS: LEVEL SPEEDS	SPEED INCREMENTS: DIVE SPEEDS	SPEED CHANGES: POWER FACTORS	SPEED CHANGES: BRAKE FACTORS -3	ALTITUDE CHANGES: CLIMB RATE -1/1	ALTITUDE CHANGES: (ADV) ZOOM CLIMB	ALTITUDE CHANGES: DIVE RATE +1/3	BASIC MANEUVERS: BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	ADVANCED MANEUVERS: SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
1-100	1-2	3-6	7	2	5	2	+3	16	0	2	3	6	4	6	5	8	6	9	3	5
101-200	1-2	3-6	7-8	2	5	2	+3	17	0	2	3	6	4	6	5	8	6	9	3	5
201-300	1-3	4-6	7-8	2	5	2	+4	17	0	2	3	6	4	7	5	9	6	9	3	6
301-400	1-3	4-5	6-8	2	4	1	+4	17	1	2	3	6	4	7	5	9	6	10	4	6
401-500	1-3	4-5	6-9	1	4	1	+4	18	1	2	3	6	5	7	6	9	7	10	4	6
501-600	1-3	4-5	6-9	1	4	1/2	+4	19	1	2	3	6	5	7	6	9	7	11	4	7
601-700	1-4	5	6-9	1	4	1/5	+5	20	1	2	4	7	5	8	6	10	7	11	4	7
701-800	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
801-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(OP) LOADED	+1	-1	-1	xxx	xxx	-2	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Model with this engine introduced in mid 1916. 495 were built with this engine. Used by France, Britain, Italy, Belgium and Russia. Primarily used as a fighter.

45a SOPWITH F.1 Camel (150 hp B.R.I)

FULL NAME: Sopwith Aviation Company F.1 Camel

GREAT BRITAIN

POINT VALUE: (35) 21-10-5-3

PLANE MOVEMENT CHARACTERISTICS CHART

ALTITUDE (X25')	SPEED INCREMENTS: STALL SPEEDS	SPEED INCREMENTS: LEVEL SPEEDS	SPEED INCREMENTS: DIVE SPEEDS	SPEED CHANGES: POWER FACTORS	SPEED CHANGES: BRAKE FACTORS -2	ALTITUDE CHANGES: CLIMB RATE -1/2	ALTITUDE CHANGES: (ADV) ZOOM CLIMB	ALTITUDE CHANGES: DIVE RATE +1/3	BASIC MANEUVERS: BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	ADVANCED MANEUVERS: SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
1-100	1-2	3-6	7	3	5	4	+3	15	0(0)	1(1)	2(1)	3(2)	1	3	2	5	3	7	3(2)	5(4)
101-200	1-2	3-6	7-8	3	5	4	+3	15	0(0)	1(1)	2(1)	3(2)	1	3	2	5	3	7	3(2)	6(4)
201-300	1-2	3-6	7-8	2	5	3	+3	16	0(0)	1(1)	2(1)	4(2)	1	3	2	5	3	8	3(2)	6(4)
301-400	1-3	4-6	7-8	2	4	2	+4	16	1(0)	2(1)	2(1)	4(3)	1	4	2	6	3	8	3(2)	6(4)
401-500	1-3	4-5	7-9	2	4	2	+4	17	1(0)	2(1)	2(1)	4(3)	2	4	3	6	4	9	3(2)	6(4)
501-600	1-3	4-5	6-9	2	4	1	+4	18	1(0)	2(1)	2(1)	4(3)	2	4	3	6	4	9	4(2)	6(4)
601-700	1-3	4-5	6-9	2	4	1	+5	19	1(0)	2(1)	2(1)	4(3)	2	4	3	6	4	9	4(3)	7(5)
701-800	1-4	5	6-10	2	4	1	+5	19	1(0)	2(1)	2(1)	4(3)	2	5	3	7	4	10	4(3)	7(5)
801-850	1-4	5	6-10	1	4	1/3	+5	20	1(0)	2(1)	2(1)	5(4)	2	5	3	7	5	10	4(3)	7(5)
(OP) LOADED	+1	0	-1	0	0	-1	P	-2	+1	+2	+2	+3	+1	+3	+2	P	P	P	P	P

NOTES: Introduced in mid 1917. A total of 5,490 F. 1 Camels were built. Used by Britain, Belgium, and the United States. Primarily used as a fighter. The model with this engine was mainly used by R.N.A.S. units.

9a F.E.2d (250 hp Rolls Royce Eagle III)

FULL NAME: Royal Aircraft Factory Farman Experimental F.E. 2d

Great Britain

POINT VALUE: (27) 39-19-10-5

PLANE MOVEMENT CHARACTERISTICS CHART

(X25')	SPEED INCREMENTS: STALL SPEEDS	SPEED INCREMENTS: LEVEL SPEEDS	SPEED INCREMENTS: DIVE SPEEDS	SPEED CHANGES: POWER FACTORS	SPEED CHANGES: BRAKE FACTORS -1	ALTITUDE CHANGES: CLIMB RATE -1/1	ALTITUDE CHANGES: (ADV) ZOOM CLIMB	ALTITUDE CHANGES: DIVE RATE +1/3	BASIC MANEUVERS: BANK LEVEL	BANK DIVE	TURN LEVEL	TURN DIVE	SLIP LEVEL	SLIP DIVE	ADVANCED MANEUVERS: SKID LEVEL	SKID DIVE	H-LP/IMMEL LEVEL	H-LP/IMMEL DIVE	ROLLS LEVEL	ROLLS DIVE
1-100	1-2	3-5	6	1	6	1	+1	7	1	2	3	4	3	4	4	6	7	8	5	7
1-200	1-2	3-5	6	1	6	1	+1	7	1	2	3	4	3	4	4	6	7	8	5	7
1-300	1-2	3-4	5-6	1	6	1	+1	7	1	2	3	4	3	4	4	6	7	9	6	8
1-400	1-3	4	5-6	1	6	1/2	+1	8	1	2	3	5	3	4	4	6	7	9	6	8
1-500	1-3	4	5-6	1	6	1/3	+1	8	2	3	3	5	3	4	4	6	7	9	7	9
1-600	1-3	4	5-6	1	6	1/4	+1	8	2	3	3	5	3	5	4	7	8	10	7	9
1-700	1-3	4	5-7	1	6	1/6	+2	9	2	3	4	5	4	5	5	7	8	10	7	9
1-800	1-3	4	5-7	1	5	1/10	+2	9	2	3	4	5	4	5	5	7	9	11	8	9
1-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OP) ADED	0	0	-1	0	0	-1	P	-1	+1	+2	+1	+1	+1	+2	+2	P	P	P	P	P

TES: Introduced in mid 1916. 186 were built. Used by Britain. Primarily used for reconnaissance and as a Bomber. Nicknamed "Fee".

SIZE MODIFIER: 0 STEADY SHOT(OP): 2-5
FLEXIBLE GUN TURNING (ADV): – – – –
RELOAD TIME (OP): C:12

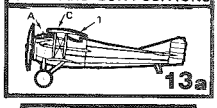
LOAD(OP):	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	8	–	–	2	–	–	–	–	–	–

SPECIAL RULES (ADV & OP): Gun A requires "11-12" to clear a Jam.

SIGHTING VALUES (OP)

12 / 52 / 41 / 42 / ▲ / U:41 / D:43 / 43 / 42 / 53 / 6 / 8 / 4 / 10 / 2

CREW AND GUN POSITIONS



STRATEGIC GAME INFORMATION

COMBAT	RANGE
5 - 1	7
CLIMB	
370-110	
GLIDE	
240-320-400	

PLANE TARGET CHARACTERISTICS CHART

W 7 S 7 L 2 T 3

CREW 1 3 2 – 3 – 4 – 5 – 6 – 7 – 8 –

ENGINES 1 E 3T E – E – E –

VARIANTS (ADV):

PLANE GUN CHARACTERISTICS CHART

GUN POS.	A	B	C
RANGE	10		8
OPER.	Crew 1	OR	Crew 1
AMMO (OP)	14		3x6
GUN PLAY			

VARIANT GUN CHARACTERISTICS

	D	E	F

MASS GAME INFORMATION

SPEEDS	
3-5-8	
CLIMB	DIVE
1	6
CEILING	
7	
MANEUVER NO.	
7	
FIRE	
2-2-1	- - - - - -
HITS	
2	

ZE MODIFIER: 0 STEADY SHOT(OP): 3-3
LEXIBLE GUN TURNING (ADV): – – – –
ELOAD TIME (OP): 12

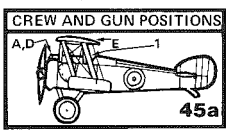
OAD(OP): 1	C	G	R	S	T	1	2	3	4	5	6	7
	–	4	–	–	–	4	2	1	–	–	–	–

PECIAL RULES (ADV & OP): Use numbers in parenthesis when anking, Turning, or Rolling to the right.

SIGHTING VALUES (OP)

12 / 45 / 36 / 44 / ▲ / U:41 / D:52 / 43 / 42 / 52 / 6 / 8 / 4 / 10 / 2

CREW AND GUN POSITIONS



STRATEGIC GAME INFORMATION

COMBAT	RANGE
7-1	8
CLIMB	
650-470	
GLIDE	
160-210-260	

PLANE TARGET CHARACTERISTICS CHART

W 6 S 6 L 2 T 3

CREW 1 3 2 – 3 – 4 – 5 – 6 – 7 – 8 –

ENGINES R E 3T E – E – E –

VARIANTS (ADV): Alternate armament (common) (Points: 35)

PLANE GUN CHARACTERISTICS CHART

GUN POS.	A	B	C
RANGE	10		
OPER.	Crew 1		
AMMO (OP)	28-28		
GUN PLAY			

VARIANT GUN CHARACTERISTICS

	D	E	F
	3	[3]	
	10	8	
	Crew 1	Crew 1	
	28	4 x 6	

MASS GAME INFORMATION

SPEEDS	
3-6-9	
CLIMB	DIVE
2	6
CEILING	
9	
MANEUVER NO.	
9	
FIRE	
4-3-3	– – – – –
HITS	
2	

SIZE MODIFIER: +2 STEADY SHOT(OP): 1-5
FLEXIBLE GUN TURNING (ADV): 1/ Turn.
RELOAD TIME (OP): A, B, D, E: 7. C, F:8.

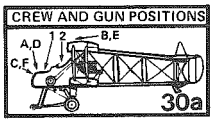
LOAD(OP): 1,2	C	G	R	S	T	1	2	3	4	5	6	7
	×	8	–	–	–	6	4	2	–	–	–	–

SPECIAL RULES (ADV & OP): Guns C and F must be reloaded by Crew 1.

SIGHTING VALUES (OP)

12 / 33 / 32 / 33 / ▲ / U:35 / D:34 / 41 / 53 / 54 / 6 / 8 / 4 / 10 / 2

CREW AND GUN POSITIONS



STRATEGIC GAME INFORMATION

COMBAT	RANGE
5 - 1	10
CLIMB	
170 - 100	
GLIDE	
110 - 150 - 190	

PLANE TARGET CHARACTERISTICS CHART

W 7 S 6 L 2 T 3

CREW 1 3 2 3 – 4 – 5 – 6 – 7 – 8 –

ENGINES 1 E 3P E – E – E –

VARIANTS (ADV): Extra fixed gun. (Points: 30)

PLANE GUN CHARACTERISTICS CHART

GUN POS.	A	B	C
RANGE	10	10	10
OPER.	Crew 1	Crew 1	Crew 2
AMMO (OP)	6X6		
GUN PLAY			

VARIANT GUN CHARACTERISTICS

	D	E	F
	(3)	(3)	3-3
	10	10	10
	Crew 1	Crew 1	Crew 2
	6X6		

MASS GAME INFORMATION

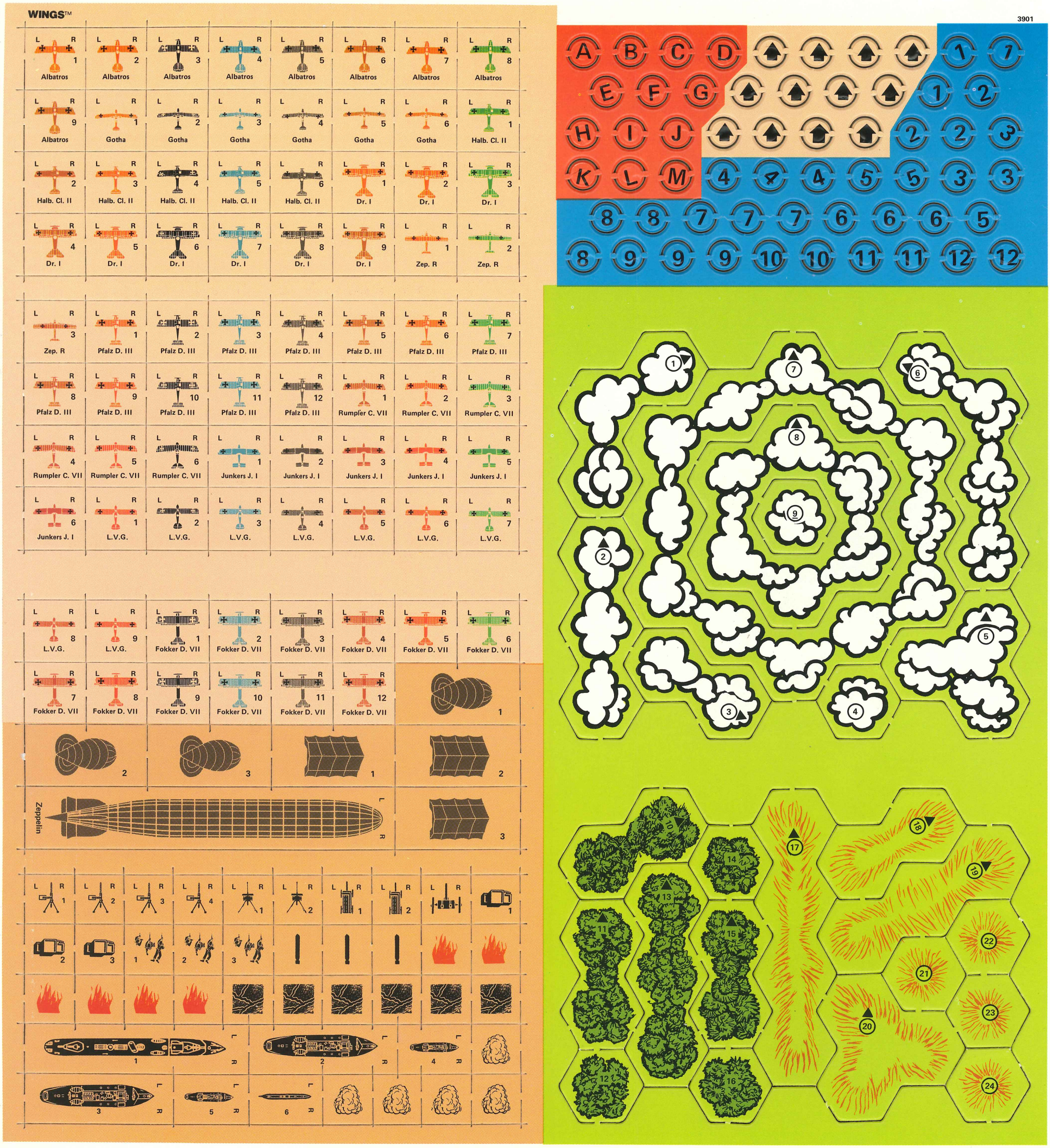
SPEEDS	
3-4-6	
CLIMB	DIVE
1	2
CEILING	
8	
MANEUVER NO.	
3	
FIRE	
4-3-3	2-1-1
HITS	
2	

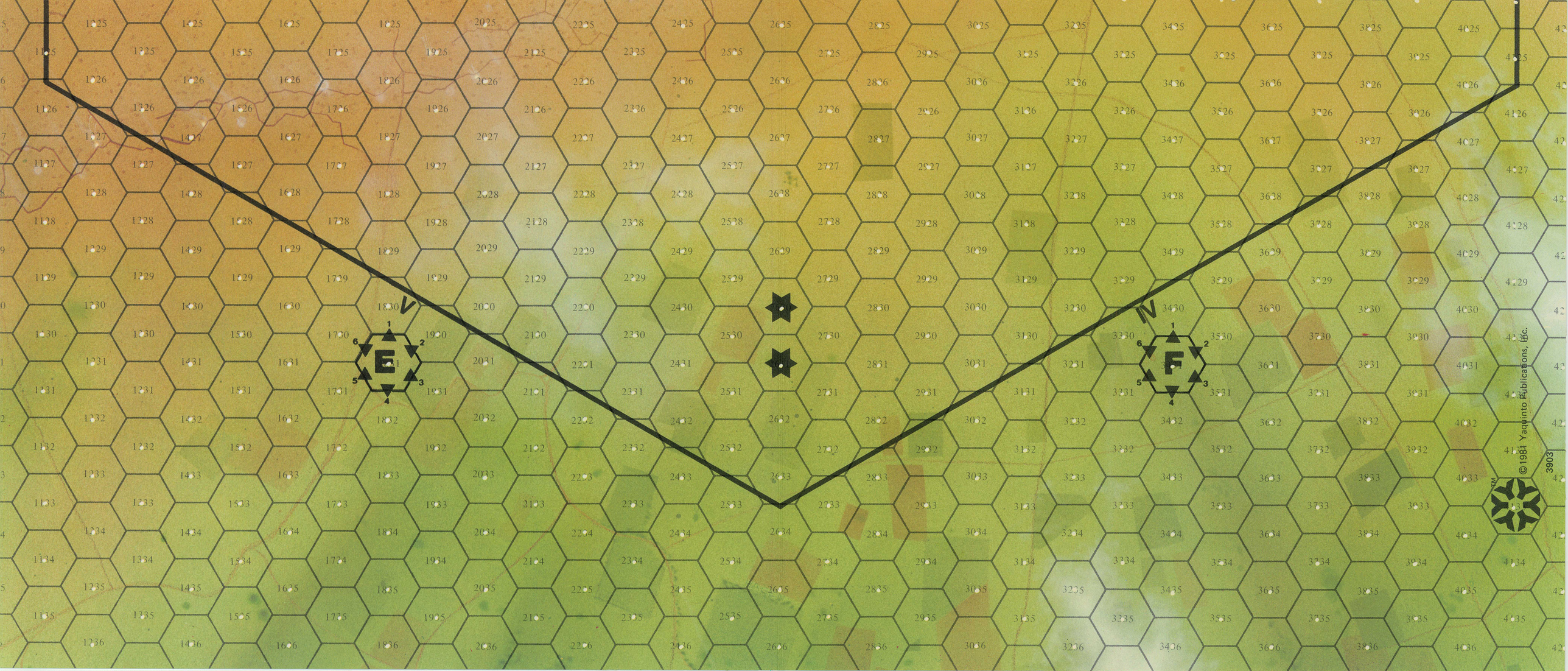
Short 184 1	Short 184 2	Short 184 3	D.H. 2 1	D.H. 2 2	D.H. 2 3	D.H. 2 4	D.H. 2 5
D.H. 2 6	D.H. 2 7	D.H. 2 8	D.H. 2 9	D.H. 2 10	D.H. 2 11	D.H. 2 12	Sop. 1 1/2 1
Sop. 1 1/2 2	Sop. 1 1/2 3	Sop. 1 1/2 4	Sop. 1 1/2 5	Sop. 1 1/2 6	Sop. 1 1/2 7	Sop. 1 1/2 8	Sop. 1 1/2 9
F.E. 2 1	F.E. 2 2	F.E. 2 3	F.E. 2 4	F.E. 2 5	F.E. 2 6	F.E. 2 7	F.E. 2 8
F.E. 2 9	B.E. 1	B.E. 2	B.E. 3	B.E. 4	B.E. 5	B.E. 6	B.E. 7
B.E. 8	B.E. 9	Pup 1	Pup 2	Pup 3	Pup 4	Pup 5	Pup 6
Pup 7	Pup 8	Pup 9	Pup 10	Pup 11	Pup 12	R.E. 8 1	R.E. 8 2
R.E. 8 3	R.E. 8 4	R.E. 8 5	R.E. 8 6	R.E. 8 7	R.E. 8 8	R.E. 8 9	D.H. 1
D.H. 2	D.H. 3	D.H. 4	D.H. 5	D.H. 6	D.H. 7	D.H. 8	D.H. 9
S.E. 5 1	S.E. 5 2	S.E. 5 3	S.E. 5 4	S.E. 5 5	S.E. 5 6	S.E. 5 7	S.E. 5 8
S.E. 5 9	S.E. 5 10	S.E. 5 11	S.E. 5 12	Bristol 1	Bristol 2	Bristol 3	Bristol 4
Bristol 5	Bristol 6	Bristol 7	Bristol 8	Bristol 9	Bristol 10	Bristol 11	Bristol 12
Camel 1	Camel 2	Camel 3	Camel 4	Camel 5	Camel 6	Camel 7	Camel 8
Camel 9	Camel 10	Camel 11	Camel 12	0/400 1	0/400 2	0/400 3	Dolphin 1
Dolphin 2	Dolphin 3	Dolphin 4	Dolphin 5	Dolphin 6	Dolphin 7	Dolphin 8	Dolphin 9
Dolphin 10	Dolphin 11	Dolphin 12	Ca. 3 1	Ca. 3 2	Ca. 3 3	L. 1 1	L. 1 2

Voisin 1	Voisin 2	Voisin 3	Voisin 4	Voisin 5	Voisin 6	Nieuport 1	Nieuport 2
Nieuport 3	Nieuport 4	Nieuport 5	Nieuport 6	Nieuport 7	Nieuport 8	Nieuport 9	Nieuport 10
Nieuport 11	Nieuport 12	F.B.A. 1	F.B.A. 2	F.B.A. 3	Spad 1	Spad 2	Spad 3
Spad 4	Spad 5	Spad 6	Spad 7	Spad 8	Spad 9	Spad 10	Spad 11
Spad 12	Br. 14 1	Br. 14 2	Br. 14 3	Br. 14 4	Br. 14 5	Br. 14 6	Br. 14 7
Br. 14 8	Br. 14 9	H.D. I 1	H.D. I 2	H.D. I 3	H.D. I 4	H.D. I 5	H.D. I 6
H.D. I 7	H.D. I 8	H.D. I 9	H.D. I 10	H.D. I 11	H.D. I 12	Salmson 2 1	Salmson 2 2
Salmson 2 3	Salmson 2 4	Salmson 2 5	Salmson 2 6	Salmson 2 7	Salmson 2 8	Salmson 2 9	L. I 3
Pomilio 1	Pomilio 2	Pomilio 3		Lohner 1	Lohner 2	Lohner 3	C.C. 1
Pomilio 4	Pomilio 5	Pomilio 6		C.C. 2	C.C. 3	Brandenburg 1	Brandenburg 2
S.V.A. 1	S.V.A. 2	S.V.A. 3		Brandenburg 3	Brandenburg 4	Brandenburg 5	Brandenburg 6
S.V.A. 4	S.V.A. 5	S.V.A. 6		Phonix 1	Phonix 2	Phonix 3	Phonix 4
Phonix 5	Phonix 6	Berg 1	Berg 2	Berg 3	Berg 4	Berg 5	Berg 6
Aviatik 1	Aviatik 2	Aviatik 3	Fokker E 1	Fokker E 2	Fokker E 3	Alb. C. III 1	Alb. C. III 2
Alb. C. III 3	Rumpler 6 B 1	Rumpler 6 B 2	Rumpler 6 B 3	Alb. D. II 1	Alb. D. II 2	Alb. D. II 3	Alb. D. II 4
Alb. D. II 5	Alb. D. II 6	D.F.W. 1	D.F.W. 2	D.F.W. 3	D.F.W. 4	D.F.W. 5	D.F.W. 6

WINGS™

3901


Albatros
Gotha
Halb. Cl. II
Dr. I
Zep. R
Pfalz D. III
Rumpler C. VII
Junkers J. I
L.V.G.
Fokker D. VII
Zeppelin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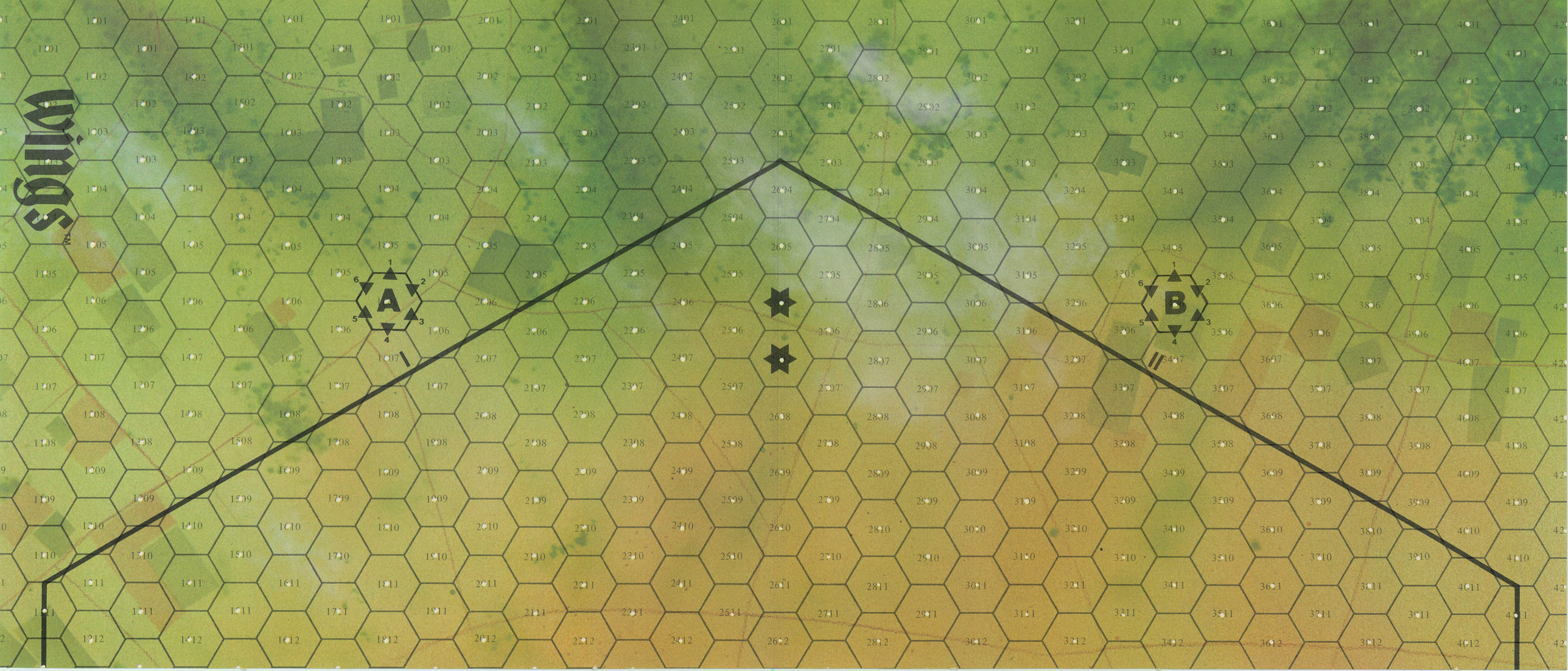
Wings
A
B