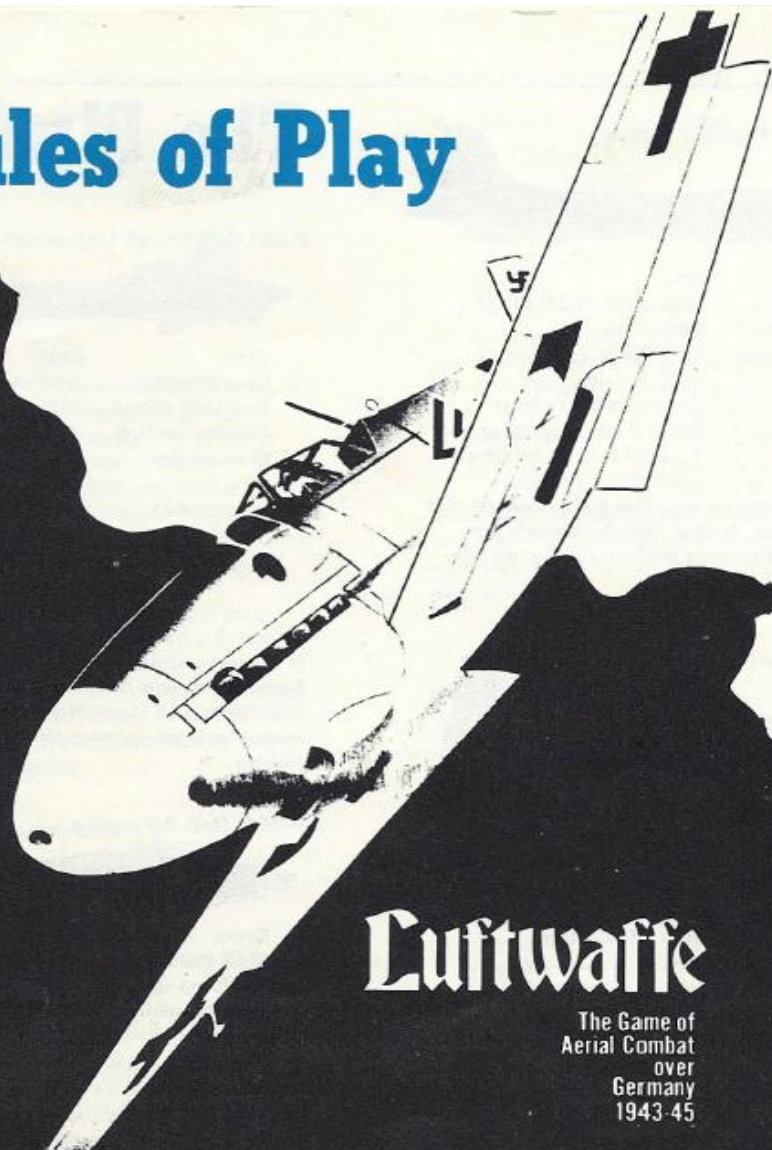


# Rules of Play



## Luftwaffe

The Game of  
Aerial Combat  
over  
Germany  
1943-45

### INTRODUCTION

Welcome to the unique — exciting — and wonderful world of Simulation Gaming. LUFTWAFFE is no "game of chance." It is a "strategical-simulation" which simply means that real life combat units have been translated into a manageable symbolic format which permits them to be re-created as a two-player game. The Rules of Play provide a framework for this re-creation. The rules are basically common sense backed-up by historical research and game theory.

While at first the game may seem complex to you, you will find that with familiarity comes a sense of the overall scheme of play which enables you to make an intuitive use of the rules rather than having to commit them to memory letter-by-letter. So, read the rules once and then play a practice game or two, referring back to the written rules as questions come to mind. In this way the game itself becomes a learning device to help you absorb the details of play. Above all, remember; you control the game and the rules are simply a logical framework for your use.



# Basic Game

## GAME EQUIPMENT

Aerial Table Sheet  
3-sectional Mapboard  
German die-cut Plane Counters  
American die-cut Plane Counters  
Target Pad  
German Order of Battle Card  
American Order of Battle Card  
Rules-of-Play Folder  
Campaign Briefing Booklet  
Die (the die has nothing to do with movement - it is used only in conjunction with the combat tables).

Spread out all the game components on a table and just generally familiarize yourself with them before reading any further.

**DO NOT PUNCH OUT THE PLAYING PIECES BEFORE YOU HAVE READ ALL THE RULES**

For current replacement parts list send a stamped, self-addressed envelope marked "parts list" to: The Avalon Hill Game Company, 4517 Harford Road, Baltimore, Maryland 21214.

## MAPBOARD SYMBOLS

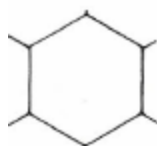
A. A hexagonal grid is superimposed on the mapboard to facilitate the movement of the playing units. These hexagons will be referred to as "squares."

B. The Basic Game recovery line (R line) is indicated by this series of yellow dashes.

C. The Tournament Game R line is indicated by a solid yellow line. This is ignored in the Basic Game.

D. Numbered squares in the Baltic Sea off northern Germany are used as starting locations for Sneak Raiders.

E. This symbol indicates that the city in that square has an aircraft factory.



F. This symbol indicates that the city in that square contains an industrial complex.

Industrial complexes are not pertinent to the Basic Game.

G. This symbol indicates that an airbase is located in that square. All airbases shown on the mapboard are German.

No American airbases are shown on the mapboard.

H. This symbol indicates that the city in that square contains an oil refinery.

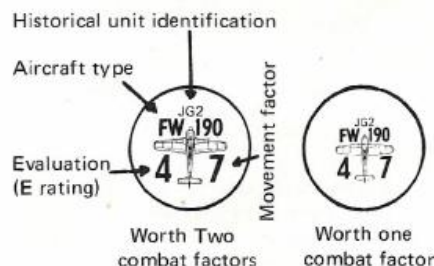
I. This symbol indicates a rail line. Any city which has a rail line running into it or out of it is a rail center.

J. The numbers along the edge of the mapboard in Poland are explained in the Tournament Game. They are not used in the Basic Game.



## PLAYING PIECES

A. The German unit counters are green. The American counters are blue. When the larger aircraft side faces up, the unit is worth two combat factors. When the side with smaller aircraft faces up, the unit is worth one combat factor.



The aircraft type is important when using the Combat Result Table and for determining time in air.

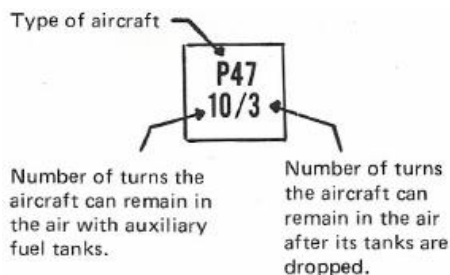
The Evaluation (E rating) is used when determining combat results between fighters. Bombers have no E rating.

The movement factor indicates the maximum number of squares that the unit can move in one turn.

B. The TIME NOW pieces are used to indicate which turn of the game is currently being played. Numbers from 1 to 20 are printed on the Order of Battle Cards (there are 20 turns in the Basic Game); the TIME NOW piece is placed on the number of the turn being played at that moment.

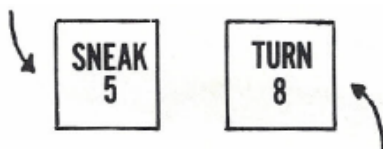


C. AIRCRAFT TIME pieces indicate the length of time that a given type of aircraft can stay in the air. Note that not all types of aircraft have these pieces, and not all types of aircraft have drop tanks.



In the above example, P 47's cannot remain in the air more than 10 turns.

D. Two kinds of pieces are used in conjunction with Sneak Raids. This piece indicates the number of bomber counters participating in the raid. The number of bomber counters may not exceed five.



This piece indicates the turn during which Sneak Raid counters are placed on the numbered Baltic Sea squares. Sneak Raiders may appear from Turn No. 3 to Turn No. 10 inclusive.

E. Shuttle pieces are not used in the Basic Game.



F. Substitute counters may be used by players who find large stacks of counters awkward to handle.

### PREPARE FOR PLAY

A. The Order of Battle for the Basic Game is printed on the mapboard.

B. The German player places his aircraft counters on any square on the board that contains an airbase. Only one counter may be put on anyone square.

C. The American player determines his Sneak Raid strategy. He picks two Sneak Raid pieces (one indicates the number of raiding counters, and the other indicates the turn of the raid) and places them face down on the designated square in the Baltic Sea. The actual counters that will participate in the Sneak Raid are / held off the board and out of sight. If no Sneak Raid is planned, invert blank counters.

D. The American player plans his bombing missions on a Target Sheet, which he keeps confidential. He will show this to the German player at the end of the game to confirm that the bombers were sent to the targets that they bombed.

E. American player selects which units, if any, he will move on Turn 1 and places them on any square(s) on his side of the R lines.

F. American units which will not cross the R-Line during Turn No.1 are placed on the board and covered by blank circular or square counters and *cannot* be examined by the German player. Up to 10 unused counters (such as B-26 counters, blank counters, and substitute counters) can be used in dummy stacks to keep the German from anticipating how much

force you have committed to each front.

### **HOW TO MOVE**

A. In his turn, a player has the option to move some or all of his units that are on the board. Each unit can move no farther than its Movement Factor, which is printed on the unit itself. For example, the Movement Factor of the FI90 is 7. A FI90 unit could move no more than 7 squares in anyone turn.

B. Unused movement cannot be transferred from one unit to another, nor can it be accumulated from one turn to the next.

C. One player cannot move any of his units when his opponent is taking his turn.

D. Bombers must always move straight to their assigned target. They must travel their full movement factor each turn until they arrive at the target. They end their turn on the target square,- even if they have not used their full Movement

Factor in that turn. (See also: Bomber Missions.)

E. After bombing, bombers must return to the R line they started from, traveling at their full Movement Factor each turn. (See also: Bomber Missions.)

F. Fighters may move less than their full Movement Factor. Fighters may move in any direction or combination of directions each turn. (See also: Fighter Missions.)

G. No combat occurs until all movement is completed.

H. No movement is allowed after combat is resolved in any player's half-turn.

I. A player may *never* move units into Switzerland or through Switzerland.

J. The die has no effect on movement. It is used only to resolve combat.

# Game Procedure

## HOW TO PLAY

A. The German player moves first. He moves his TIME NOW piece to cover the number of the turn that is now in progress. (See: Fighter Missions/Staging.)

B. The German moves any or all aircraft counters that he wishes.

C. If a type of aircraft takes off (for example, the Me 109's), the AIRCRAFT TIME piece for that type is placed on the appropriate Turn number.

D. The German player resolves all combat caused by his move.

E. If American bombers with defensive guns were attacked, they fire back.

F. No American unit can move during the German half of the turn.

G. The German player announces that he is finished with his half of the turn and that the American player should begin his half.

H. The American player moves his TIME NOW piece to cover the number of the turn that is now in progress. At this point, both German and American pieces should cover the same turn number.

I. Appropriate action (if any) concerning a Sneak Raid is taken.

J. The American player moves any or all of his aircraft counters on the board.

K. New units, which will cross the R line on the next turn, are uncovered and placed on their starting squares behind the R line. All American planes must spend at least one turn on the safe side of the R line before crossing. The German may examine the uncovered stacks on these squares.

L. The AIRCRAFT TIME piece for these new units is placed on the appropriate

turn number.

M. The German player fires his antiaircraft guns at any units that rest on a city or that have passed over that city during their movement in that turn.

N. Surviving bombers over their targets bomb them, and the cities are crossed off the Target Sheet.

O. All fighter combat caused by American movement is resolved.

P. No German unit can move during the American half of the turn.

Q. The American player announces that he is finished with his half of the turn and that the German player should begin the next Turn.

R. Repeat steps A through Q until the 20th turn has been played, or until all American units leave the mapboard, whichever occurs first.

## HOW TO WIN

A. The German player wins if 8 or less cities with aircraft factories are bombed.

B. If 9, 10 or 11 cities with aircraft factories are bombed, game is a draw.

C. The American player wins if 12 or more cities with aircraft factories have been bombed when the game is over.

D. There is a penalty for losing planes because of fuel shortages. The German player loses one city for each factor which runs out of fuel and cannot land on a base. For each American factor which fails to recross the R line because of fuel shortages, the Germans "save" one city. For example: if the American bombed 12 cities, but 2 fighter factors ran out of fuel before they could recross the R line, or 2 factors failed to get off the board before the turn 20 deadline, the German player would have only 10



bombed cities.

### **TIME RECORD**

A. The time record is kept on the Order of Battle Cards, where Turn Numbers from 1 to 20 are printed. For the Basic Game, use the time record printed on the Tournament Game Order of Battle Card.

B. The game consists of 20 turns. It may end sooner if all of the American bombers have recrossed the R line.

C. When it is his turn to move, the first thing each player does is to move his TIME NOW piece to cover the number of the turn then in progress.

D. Players keep each other informed about which turn of the game is being played.

E. The recovery times of the American units are kept track of on this same chart, as are the landing times of the German units on the German chart. These times are kept track of on a player's own chart and are kept confidential, to prevent the opponent from anticipating the withdrawal of any particular type.

F. When the TIME NOW piece moves over a Turn Number covered by an AIRCRAFT TIME piece, all planes of that type must land, if they are German, or recross the R line, if they are American before the end of the turn. Units that do not land or recross the R line when required to do so are eliminated. (See also: How To Win.).

G. All American units must recross the R line before the end of the 20th turn. (See also: How To Win/D.)

## **Movement of Units**

### **TIME IN AIR**

A. German planes

1. All German planes of the same type must take off at the same time. For example, all Me 109 units must take off at the same time.

2. When all planes of one type take

off, that type's AIRCRAFT TIME counter is put on the proper Turn Number on the time record. All planes which can carry auxiliary fuel tanks must do so each time they take off even though tanks were dropped on earlier flights. For example; if Me109's take off on Turn 3, the Me 109 time counter is put on Turn 7 which is four turns in the future. When the Me109's have held their tanks and the TIME NOW counter is moved to Turn 7, they must land before that turn ends. Those that do not are eliminated (see also: HOW TO WIN/D for exception). No unit may enter combat on the turn it has to land.

B. American planes

1. B-17's and B-24's do not have AIRCRAFT TIME pieces because they must proceed directly to and from their targets.

2. As all fighters of the same type start behind the R line in the same turn, their AIRCRAFT TIME counter is put on the time record on the proper turn number. For example: as P-47's arrive on the R line in Turn 2, the P-47 time counter is put on Turn 12. The P-47's are not required to cross the R line on next or later turns, but all must recross the R line for good no later than Turn 12. If they do not they are eliminated (see: HOW TO WIN/D).

C. Both sides

1. AIRCRAFT TIME counters with 2 numbers are used by fighters which carry droppable external fuel tanks. The left number shows how many air turns each type has if its tanks are not dropped early. The right number shows the number of air turns if tanks are dropped. For example; if a P-47 holds his tanks, he has a maximum of 10 turns in the air, without tanks he has only 3 turns in the air.

2. Both players have the option to

drop their tanks during any portion of any turn.

3. If any planes of a certain type drop their tanks, all planes of that type are considered to have dropped their tanks.

4. Dropping tanks forces an adjustment of the AIRCRAFT TIME counter on the time record. For example: P-47's which arrive on the R line in Turn 2 must put their time counter on Turn 12. If they drop tanks in Turn 5 the time counter is moved to Turn 8 because they have only 3 air turns without their auxiliary tanks. All P-47's must recross the R line before Turn 8 ends. Tanks dropped on Turn 9 or later would not alter recovery time.

5. Subtract the number on the right of the AIRCRAFT TIME counter from the number on the left to learn the number of turns external fuel tanks keep a plane in the air. For example: tanks keep a P-47 airborne 7 turns (10 minus 3). Fuel is taken from tanks first and when empty are automatically dropped. Thus after a P-47 has been in the air 7 turns its tanks are dropped automatically.

6. Refueling can occur only at bases. Only German planes can refuel. No more than two combat factors (one full-strength unit) can be refueled at a base in one turn. If a unit lands during Turn No.5, it can depart on Turn No.6, providing that all other units of that same type are ready to go. Refueling takes no time, but no unit can take off again until all other units of that same type are refueled.

7. When several units of the same type land on one base at the same time, only one full-strength unit (two combat factors) or two half strength units can be refueled each turn. None may leave until all are refueled. Units that have refueled while other aircraft units of their

type are still refueling, or in the air, may Stage to another base, but they may not enter combat until all aircraft of the same type are refueled.

8. German units that cannot reach a base and American units that cannot recross the R line before fuel exhaustion must be removed from the board as soon as the situation is discovered. These units are eliminated immediately and cannot make banzai attacks.

#### **MORE THAN ONE UNIT PER SQUARE**

A. After the game begins, there is no limit to the number of units that may occupy the same square. There is never any limit to the number of airborne units in one square.

B. Stacking fighters with bombers does not give the bombers any increase in movement distance, nor does it give the fighters any increase in time aloft.

C. No piece, stacked or unstacked, may move farther than the movement factor printed on it in anyone turn.

D. Units may combine or split up in the middle of a turn without movement penalty .

E. Combined units may stay together indefinitely.

F. Except for close-escort fighters, units may combine in one turn and separate on the next or some future turn.

G. Units may pass through squares containing other friendly or enemy units without movement penalty.

## **Bomber Missions**

A. Mission planning

1. Mission planning is done on the Target Sheet.

2. Draw a line between the number of the bomber unit and its target. That bomber may bomb no other city.

3. No unit can attack more than one target but more than one unit can be assigned to the same target

4. If the bomber is to attack an airbase, draw a line from the bomber unit number to "Airbase Attack" at the bottom of the third column.

5. When several bomber units are on one square and one or more are eliminated by combat, the German player chooses the counters to be removed. He is not, of course, told the intended target of those counters.

6. Bombers may leave on their missions at any time during the game, individually or in groups. They must spend their first turn on the board behind the R line, and they must recross that same R line before the 20th turn ends (see also: How To Win/D).

#### B. Bombing cities

1. Each bomber counter represents two combat factors when the larger aircraft is face up on the counter.

2. Only one combat factor is needed to eliminate a target.

3. Even though each bomber counter is strong enough to destroy two targets, it cannot be sent to attack more than one.

4. Only bombers of the same type may mass into large formations. Thus, B-17's cannot fly in the same square as B-24's. During movement they may pass through a square containing the other type. Fighters may fly with any type of bomber when providing close escort.

5. Bombers of the same type may fly together in huge stacks as long as the route to be flown by the mass is the most direct course to the target of each unit in the stack.

6. "The most direct course" is defined

as: "The route that takes the least number of air turns from departure point to target and back to the R line." Minor deviations that increase the distance by one or two squares are permissible if they do not increase the number of turns in the air needed to reach the target or, when returning, the R line.

7. Smaller bomber groups may leave the main mass at any time.

8. Bombers must move their full movement factor every turn until they arrive over the target. Any movement remaining after the unit reaches its target is not used.

9. During the turn in which a bomber unit reaches its target, the AA guns of the target fire.

10. Only bomber units that have survived the defending AA fire may bomb.

11. Units that have bombed their targets cannot go deeper into Germany.

12. Bomber units must exit from the board through the R line that they originally crossed.

13. All industries in a city are destroyed and cannot be rebuilt when one or more bomber units bomb it (see also: HOW TO WIN/D for exception) .

#### C. Bombing bases

1. All the rules under Bombing Cities apply here. Additional rules follow.

2. Bomber units that are assigned to attack airbases may attack any airbase the American player chooses.

3. Since the American player can decide to attack any particular base at any time, the bomber unit does not have to travel "the most direct route" to the target. It must travel the most direct route when returning to the R line.



4. There is no limit to the number of bases that can be attacked, but one bomber unit may make no more than one attack.

5. When an airbase is bombed, all aircraft on it are eliminated and that base is unusable for the rest of that quarter.

6. Bombers do not have to endure fire from the light AA at the base being bombed, but if that base is in the same square as a city, the heavy city guns fire before those bombers can attack the base.

7. Bombing a base which is in the same square as a city does not destroy the city, nor does bombardment of the city automatically destroy the base. These are two distinct targets and each must be bombed separately.

8. Bombers attacking bases may abort or turn back at any time - BUT those scheduled to attack cities must press on regardless of losses.

#### D. Sneak raids

1. At the beginning of the game, the American player commits himself, with inverted counters, to the number of bomber units making a Sneak Raid and to the Turn Number in which they will appear.

2. Two turns before the Sneak Raiders appear, the German player must be warned to expect a Sneak Raid.

3. One turn before they appear, the German player must be told the area through which they will enter.

4. On the turn they are to appear, the American player places the bomber counters on one of the squares designated in the last turn and turns the Sneak pieces right side up to corroborate the number of Sneak Raiders and the turn of appearance.

5. Raiders must spend their entry turn sitting on the numbered Baltic Sea

square. They may be attacked there by German units during the German player's next turn.

6. All Raiders must enter through the same square at the same time.

7. Raiders must reach their targets and return behind the R line on the northwest corner of the mapboard before the end of the 20th turn.

8. Only one Sneak Raid per game is permitted.

9. No aircraft, including sneak raiders, are permitted to fly into a Baltic Sea square and then leave the board. Units entering through Baltic Sea Squares can exit from the board by flying into Russia or England or Italy but never reverse course to exit through Baltic Sea Squares.

## Fighter Missions

#### A. Staging

1. German units can stage. Staging is the moving of units to locations that are more centralized.

2. At the start of the game, no base can hold more than one unit. The German player will usually want to relocate units from bases far from the R line or the Baltic squares to bases more centrally located. Therefore, the German player Stages; that is, he moves his units after the game begins so that two or more units are sitting on one base.

3. Units already in good locations remain there while the others move to join them.

4. When a Staging unit cannot take off and land in the same turn because of the distances between bases, it may end its turn in the air, but the launching of other planes of the same type for combat is prohibited until after the Staging unit has

refueled.

#### B. Fighter sorties

1. American fighters may fly only once in a game.

2. German fighters may fly as many times in the game as refueling permits. They may attack on the turn they take off.

3. Although all planes of the same type must take off at the same time (if German) or be placed behind the R line at the same time (if American), they may operate independently and may land or recross the R line individually any time before fuel exhaustion. German units that land earlier than the others of their type cannot take off until all planes of the same type have been refueled.

4. American fighters may patrol behind the R line waiting for a chance to strafe or attack the enemy. They may cross and recross the R line as often as fuel permits.

5. Fighters cannot enter the board from Baltic Sea squares.

6. American fighters may recover via either R line.

7. See also: Time in Air.

#### C. Close escort

1. American fighters can provide close escort.

2. Fighters providing close-escort must start behind the R line on top of the bombers they protect. They must stay with those bombers until low on fuel or attacked by Germans.

3. Once they are attacked, the fighters may remain with the bombers, or they may leave the bombers to dogfight with only those units that attacked them. If they dogfight, they cannot provide further close escort for that bomb group or any other. On succeeding turns after the

dogfight, the close escort is free to operate like other fighters without further restrictions. When close-in escort fighters leave their bombers, those bombers may be attacked without the former close escort being engaged first. If several fighter units are providing close escort, some may leave to dogfight, if attacked, while others continue close escort.

4. Close escorts that must discontinue protection because of fuel may not strafe or dogfight on the way back to the R line.

5. If the close escort does not dogfight with attacking fighters, the units in the close escort leave the game when they and the bombers recross the R line.

6. Close escorts may return fire on attackers only when it is their turn to move and they decide to discontinue close escort procedures.

#### D. Strafing bases

1. Any American fighter unit at any time (except when providing close escort) may strafe German fighters on a base.

2. If there are airborne German fighters over a base, they must be destroyed before those on the ground can be given up as losses. This is similar to an attack on bombers with a close escort.

3. If a city and a base are on the same square, the attacking fighters must endure the fire of the city AA and then the base AA guns before their survivors may strafe. (This does not negate the rule that says AA guns may fire only once per turn.)

4. In a strafing attack, the E rating of the attacking and defending units is ignored.

5. The results of a strafing attack are found on the same Combat Results

Table as air-to-air combat. Cross index the number of attacking factors with the die roll.

# Combat

## A. Aerial Combat Table

1. To resolve combat, use the column appropriate to the type of plane that is firing.

2. The result of the die roll is cross indexed with the number of factors that fired. For example, a 6 rolled when 14 Me 109 factors attack calls for the loss of 11 enemy factors. If 23 B-24 factors fire, the roll of a 6 achieves the same result.

3. If the exact number of factors that are firing does not appear in the column, use the next lower number. For example, the number 12 does not appear in the B-17 column; therefore, the number 11 is used for the fire of 12 B-17 factors.

4. When several different types of fighters have taken losses to the point where they cannot fire on the table, they may combine with other remnant or ineffective units and fire by using the column of the least effective of the combined types. For example, one Me 109 factor and one Ju 88 factor on the same square could fire as two Ju 88 factors.

5. If a full-strength unit is to lose 1 factor, the unit is flipped over so that the smaller aircraft side is facing up.

6. If the smaller aircraft side is already facing up, the unit is removed from play.

## B. How to have combat

1. The player moving his units is always the attacker; his opponent is the defender.

2. Combat is caused by a unit entering a square occupied by the enemy and remaining there. The only exception to this rule occurs when American bombers enter a square occupied by enemy fighters. Bombers cannot attack fighters (nor can their close-in escort fighters in this instance); so there is no combat.

3. When the attacker has finished moving, he fights all battles, one at a time, until all have been resolved.

4. Battles may be resolved in any order, but in anyone square, the "best against the best" limitation must be met (see: Combat/D/1).

5. No unit may fire more than once per turn.

6. After the attacker has rolled once for each attacking type, the defender rolls once for each type of bomber returning fire, if any.

7. Casualties can be taken only from units which participate in that particular battle. Thus, losses suffered by units over Berlin cannot be taken from different units sitting on the ground at Warsaw.

8. If the Aerial Combat Table calls for the loss of more factors than the enemy has in that particular battle, only those factors present may be lost. The overkill *cannot* be taken from units that are not involved.

9. German units cannot attack American units that are on the American side of the R line. RAF protection prohibits any such attacks.

10. Combat cannot occur between units in adjacent squares.

## C. Fighter vs. bomber

1. When German fighters end their turn on a square containing only bombers, the number of fighter factors is cross indexed with the die roll to determine bomber factors lost.

2. Attacking and defensive fire is actually simultaneous; therefore, before the bomber losses are actually taken, they may fire defensively.

3. When the result of the defensive fire is known, the German player decides which of his units are reduced in strength and/or lost. These losses are taken immediately.

4. Losses are then taken from the bomber units. All bomber units in the same square must take half-unit losses (that is, all must have the smaller aircraft side of the unit facing up) before any counters are removed from the game. The American player decides which units take the half losses.

5. When the losses are so heavy that units must be removed from the board, the German chooses which units must be removed, but he is not told the destination of any of the units.

6. E ratings are not considered in fighter vs. bomber combat.

#### D. Fighter vs. fighter

1. When fighters attack fighters, the "best against the best" limitation must be met. That is, the best of the attackers must always fight against the best of the defenders first. The best fighter has the highest E rating; this evaluation number is printed on the lower left of the unit counter. If the best attackers do not eliminate the enemy, the second best attackers must fight the best surviving enemy fighters. This continues until all of the attackers have fought once. For example, if P-51 's and P-38's are attacked by Fw 190's and Me 109's, the Fw 190's will fight the P-51's first because these planes have the higher E ratings. If any P-51's survive, the Me 109's must attack them and apply any overkill against the P-38's. The lower E-rated planes cannot be attacked until the best in

the stack are eliminated.

2. To resolve combat, compare the attackers' E rating to the defenders'. When the attackers' number equals or exceeds the defenders', the die roll is not changed. If the attackers' E rating is smaller, subtract the difference in ratings from the die roll. For example, if Me 109's (E rating 3) attack P-51 's (E rating 4). the difference in the E ratings (one) is subtracted from the die roll before losses are determined. If a 4 were rolled, losses would be found in the 3 column. If a 1 were rolled, there would never be any losses.

3. The E rating of an aircraft being attacked is two less when it holds onto its tanks.

4. The E rating of an attacking aircraft with tanks is lowered by 2. For example, the E rating of the P-51 is 4. If it attacks while still carrying tanks, its E rating is considered to be 2.

5. Example of 3 and 4: the P-47 and Me 109 both have E ratings of 3. If a tankless Me 109 attacks a P-47 with tanks, the number rolled on the die is used. If the P-47 counterattacks without dropping its tanks, 2 points are subtracted from the die roll because tanks cause an E rating to be lowered 2 points. If a 4 is rolled, the results are found in the 2 column. If P-38's (E rating 2) with tanks attack Fw 190's (E rating 4) without tanks, 4 is subtracted from the die roll.

6. When more than one type of fighter is attacking, some with tanks and some without, the "best" attacker is usually the type with the highest E rating printed on the counter. Lowering of the E rating because of tanks must be considered in determining the "best." When tanks make unequal aircraft equal, the one with the best natural E rating must fight first.

7. Losses are taken as soon as the results are known.

#### E. Fighter vs. fighter and bomber

1. When German fighters enter a square containing bombers and fighters that are not flying close escort for the bombers, those American fighters can be ignored and the bombers can be attacked directly.

2. If American fighters are flying close escort, the German fighters must destroy all of these fighters before any bomber losses occur. For example, if Me 109's attack bombers with a close escort of 2 fighter factors, and if the attack of the 109's on the fighters results in a loss of 5 factors, the two fighter factors are eliminated and the overkill losses of 3 factors are taken from the bombers. If two types of German fighters attacked and if the better type eliminated only the escort, the second type could attack the bombers.

3. Germans attacking a close escort cannot be fired upon by the bombers until at least one bomber factor is lost. If any bomber losses occur, all bomber factors in that square fire before any losses are taken.

#### F. Antiaircraft guns

1. Every city on the mapboard with a large, black dot next to its name has heavy AA guns. They fire at the end of the American movement in his turn, and they may fire at units then over the city or at any stack of units that passed over the city in that turn. If they fire at units then over the city, the loss is taken from any unit in that stack. Use the method described in Combat/C/4 and 5. Fighters traveling alone can be attacked, also.

2. The heavy AA guns of one city destroy one enemy combat factor, but only with a roll of 6.

3. Every base on the mapboard has light AA guns. These guns can fire only at strafing fighters. They cannot assist friendly airborne fighters that dogfight over a base.

4. AA guns can fire once and only once in each turn.

5. AA guns cannot be destroyed.

## Optional Basic Game Rules

A. It is admittedly unrealistic to require planes in Hungary to drop their tanks just because planes of the same type in Germany did so. This requirement and the one that says that all planes of the same type must depart and recover at the same time are used to minimize the number of details with which you are confronted when learning a new game. For greater realism, you can record the departure time of each individual unit by using the list printed on the map side of a Target Pad sheet.

We recommend that you play all versions of this game with the simplified time-in-air procedures given in the Basic Game first. Later, when your command of the game becomes more thorough, so that the additional bookkeeping enhances your pleasure, then use the above method.

#### B. Basic Game victory conditions variant:

1. American player wins if he bombs 8 cities containing oil refineries.
2. German player wins if 5 or less are bombed.
3. A draw results when 6 or 7 are bombed.

#### C. A second Basic Game victory condition variant:

1. American player wins if he bombs 14 cities containing rail centers.
2. German player wins if 11 or less are bombed.
3. A draw results if 12 or 13 are bombed.



# Tournament Game

All rules of the Basic Game are applicable for the Tournament Game except for the following additions and changes.

## How to Win

A. The American player wins by destroying all cities containing aircraft factories before the end of the game.

B. The German player wins by avoiding the American conditions of victory.

## Time

A. The Basic Game consisted of one raid. The Tournament Game can have as many as 10 separate raids. Each raid represents the results of three months' bombing; therefore, each raid represents one quarter of a year. The first quarter is Jan. '43, the second is Apr. '43, and the tenth and last is Apr. '45. These are printed on the Tournament Game Order of Battle Card.

B. A quarter ends when 20 complete turns have been played or when all American units have left the board, whichever occurs first.

C. The American player is not required to attack each quarter, but he has the option to do so. Attacking quarterly assures many chances to destroy the targets, but it also causes heavy American losses. Starting later or skipping a few quarters cuts losses but limits the number of raids that can be launched.

D. The beginning of each quarter is the same: the German player may start no more than 2 combat factors per base; the American player plans new bombing missions and Sneak Raids.

## Start Lines

A. All raids flown in 1943 must start behind the 1943 Start Line or Baltic Sea squares.

B. Raids flown in 1944 may begin behind the 1943 and/or 1944 Start Lines as well

as the Baltic Sea squares.

C. Raids flown in 1945 begin behind any of the Start Lines as well as the Baltic Sea squares.

## Jets

A. Jets (Me 262's) and rocket fighters (Me 163's) are immune to bomber defensive fire. Only fighters can shoot down jets.

B. Jets may attack first to soften up the bombers and close-escort fighters before non-jet units attack.

C. Bombers destroyed by jets are removed before the non-jet fighters attack. Only the bombers that survived the jet attack may fire at the non-jet units that attack during that turn.

D. The Me 163 must take off, attack, and land all in the same turn. The entire flight from take off to landing point cannot exceed 4 squares.

E. The Me 163's can refuel only at their home bases. If they land anywhere else, they are out of play for the remainder of that quarter.

F. When the Me 163 attacks enemy fighters, their E ratings are ignored.

G. The bases from which jets begin a quarter are the only bases where jets can refuel. If they land on a non-jet base, they cannot take off again in that quarter; but this does not prevent other jets from refueling and taking off from jet bases.

H. The German may have one jet base for every operational jet unit. Once a base is designated as a jet base, it remains so for the remainder of the game; in future quarters, jets must start on these same bases.

I. Regular fighters can refuel on a jet or rocket base, but not vice versa.

## Reinforcements

The reinforcements available for each quarter are listed on the 'Order of Battle Card. Reinforcements are new units that are added

to the survivors of the preceding quarters. They are added in almost every quarter. If the Jan. '43 quarter is skipped and the game begins with the Apr. '43 quarter, both the Jan. and Apr. forces will be used by both players. The survivors of this quarter will fight next quarter alongside the new reinforcements. When the card shows that a unit must be removed from play, one full-strength unit of that type is withdrawn from the game. If that quarter is skipped, the unit is withdrawn before the next raid begins.

### **Replacements**

A. The German player receives one replacement factor per quarter for every 4 undestroyed aircraft factories. Since there are 43 aircraft factories, he can earn a maximum of 10 replacement factors per quarter. Replacement factors are awarded at the end of each quarter for surviving aircraft factories and are used to buy back dead units at the rate of one replacement factor for one combat factor. Unused replacements may be accumulated.

B. The American player has 104 bomber and 52 fighter replacement factors that can be used up at any rate. At the end of any quarter, lost units and reduced units are placed back into the game at a cost of one combat factor for each replacement factor.

C. Both players are required to put all lost units back into the game as long as replacement factors hold out.

D. Units that are scheduled to be withdrawn must be redeemed by replacement factors if they are lost in combat or if they are below full strength. For example, in the Apr. '44 quarter the American player has to withdraw two P-47 units. If all of his P-47's had been lost in combat during the preceding quarter, the American player would still have to redeem those two P-47's that are to leave the game (at a cost of 4 replacement factors). If all of the replacement factors had been used up, the American would be forced to withdraw a different type of fighter to compensate for the withdrawal of the P-47's. The German player must follow these procedures

also.

E. All bases which were destroyed by bombing during the previous quarter are considered repaired and operational for the new quarter.

### **Shuttle Raids**

A. Planning shuttle raids

1. Shuttle Raids are planned at the same time Sneak Raids are planned. Use blank counters when no raid is planned.

2. If units are to be Shuttled to Russia from England or Italy, the American player circles the identification number of the bombers that will shuttle on the target pad. The inverted counter that says SHUTTLE TO RUSSIA and the target pad are shown to the German player after the Shuttle. These units may start from their Start Lines at any time, but they must bomb and be off the board into Russia by the end of the 20th turn.

3. If units are to be Shuttled from Russia, the identification numbers of the units are circled; also, write the turn they are to appear on the numbered square and the number of the square on the target pad. If "Square 7" is written, the units may appear on any square numbered 7. Two turns before the Shuttlers are to appear, the German player must be warned to expect Shuttle planes. One turn before they appear, the German player must be told the numbered area they will use. Shuttle planes must spend the turn of their appearance on the numbered square. They can be attacked there by any German fighters in range.

4. Shuttle raiders may be held in Russia as a threat as long as desired. They do not have to fly each quarter, but those which do must enter through the same square during the same turn.

5. Shuttle raiders in Russia also have

the option to operate from Russia as their home base.

6. Partially destroyed units arriving in Russia may combine with other partially destroyed units if desired. No units in Russia, however, can be brought back to full strength by replacement factors.

7. Sneak raiders may shuttle into Russia after bombing but cannot reverse course and fly off the board through Baltic Sea squares.

8. Returning Shuttle units may fly with Sneak Raiders entering from the Baltic Sea as long as the direct course rule is obeyed and both forces fly the same type of bomber.

#### B. 1943 raids

1. In 1943, Shuttle Raids may be conducted between England and Russia. On the Russian leg, the raiders leave the board after crossing the numbered land squares in Poland (3, 4, and 5).

2. In a later quarter, survivors can return from Russia to England. They must bomb a target and cross the 1943 Start Line by the end of the 20th turn.

3. If all Shuttle units are eliminated before they get to Russia, or if all are eliminated on their way back to England, no more Shuttles into Russia may be flown. A second group may Shuttle to Russia while the first is returning. If the first group is eliminated, the second group continues and later attempts to return, but no further Shuttles between these points may be attempted.

#### C. 1944 and 1945 raids

1. In 1944 and 1945, Shuttles may be flown between England and Italy. There is no penalty for failure.

2. Shuttles may be flown between England and Russia and also between Italy and Russia.

3. Shuttles between England and Russia

must be successful to continue (see B/3).

4. Shuttles between Italy and Russia must also be successful to continue.

5. If the Shuttles between Italy and Russia are discontinued because one such raid lost all of its planes, the Shuttles between Russia and England may still continue, and vice versa.

6. Starting with the Jan. 44 quarter and thereafter all American units may be started either in Italy or England without prior shuttling.

Q. If Shuttle raiders are shot down while operating out of Russia as their home base, is the right to shuttle lost?

A. No.

Q. Are shuttle raiders still considered to be "shuttle" aircraft while using Russia as their home base?

A. No - as long as the planes start from and return to the same Russian "R" line they are not considered shuttle raiders; and thus the ability to shuttle cannot be lost if they are eliminated.

Q. If a bomber is used on the Italian front during the 8th quarter and does not shuttle can it be used on the Belgian front during the 9th quarter? And vice versa?

A. Yes.

Q. Can sneak raiders and shuttle raiders from Russia enter on the same square on the same turn?

A. Yes. (*Editor's Note: I don't see how this is possible*)

Q. What happens if the two formations in the above question are B-17's and B-24's?

A. They separate during first move off shuttle/sneak square if possible. If separation would make either fly more hexes to the target, they may continue to occupy the same hex, but are fought as if they were in different hexes.

Q. Must shuttle bombers or Russian based aircraft stop on the numbered squares when entering Russia as opposed to exiting?

A. No.

Q. In what versions can sneak raiders shuttle to Russia?

A. The only game version which does not allow shuttling to Russia is the Basic Game.

*Note: The rules as written suggest that sneak raids to Russia can be done without limitation. The planes may then operate out of Russia or Shuttle back to Italy or England without restriction.*

### Aircraft Factories

A. Bombed factories cannot be rebuilt unless the American player loses units because of fuel shortage or the Turn No. 20 deadline rule.

B. Factories that are "rebuilt" must be chosen from those that were bombed during the goofed quarter.

## Advanced Game

All rules of the Basic Game and the Tournament Game are applicable for the Advanced Game except for the following.

### How to Win

A. The American player wins if he bombs every city on the Target Sheet.

B. The German wins by saving one city.

### Combat

A. To make an attack, the attacking unit does not have to stop on the square that the defenders are on; it may pass through and stop on some other square. Subject to movement limitations, the attacking unit can be moved as far as desired after the attack to make counterattack difficult or impossible.

B. Although leaving the attacked square is not required, a fighter must be able to leave the square before an attack can occur.

For example, a Me 109 (Movement Factor of 6) could attack a unit 5

squares away, but it could not attack a unit 6 squares away because it would not be able to leave the attacked square.

C. Bombers may pass over the city that they bomb in that turn, and start the homeward leg of their trip. Also, they can stop on the target city, even if they are not able to move farther. Whether the bombers stop on or pass over the target, the city's AA guns can fire before the bombs are dropped.

D. No unit can fire more than once per turn.

E. The Me 163 is the only unit that can conduct an attack and land in the same turn.

### Reinforcements

A. American reinforcements

1. The Advanced Game Order of Battle Card is used. This card adds new tactical units (from the 9th and 12th Tactical Air Forces) to the American side.

2. B-25, B-26, A-20, and A-26 units cannot make Sneak Raids nor can they Shuttle to Russia. They can Shuttle between Italy and England.

3. These bombers have AI RCRAFT TIME pieces. They must recross the R line when these pieces indicate, which will usually be *before* the 20th turn.

4. Bombers of different types cannot travel together.

B. German Reinforcements

1. On the Advanced Game Order of Battle Card, ten units are designated as "railroad units." Two are listed in Jul. '44, and the rest in Jan. '45. If the German player has 4 unbombed rail centers at the end of the Apr. '44 quarter, he receives both Jul. '44 railroad units. It takes two unbombed rail centers to "free" one unit; so the number of railroad units in the game must always be less than one half the number of unbombed rail centers. Calculations and any necessary

withdrawals are made at the end of each quarter. In Jan. '45, only as many railroad units can enter the game as allowed by the total of unbombed rail centers at the end of the Oct. '44 quarter, and the number of railroad units already in the game.

2. Ten of the units on the Order of Battle Card are school units. The E rating on these units is lower because school pilots were not as experienced. If none of the school units has been lost or damaged by the Jan. '45 quarter, three of them may be swapped for the three jet units so indicated on the OOB card. If none are yet lost or damaged by the Apr. '45 quarter, three more school units may be swapped for the jet units indicated there. If any school unit suffers damage at any time, the jet units can be activated by a 2 for 1 swap: two school units for one jet unit. School units may be held off the board to preclude losses but once lost can never receive replacements.

### **Replacements**

A. The American player gets 124 bomber and 102 fighter replacement factors. These are used up as described in the Tournament Game.

B. The German player receives one replacement factor per quarter for every 3 unbombed aircraft factories, but he may earn no more than 12 replacement factors. Unused factors may be accumulated.

### **Jet Production**

Starting with the Jan. '44 quarter, the German player may substitute one Me 262 unit for any unit scheduled to enter during that quarter (except school units). He may swap a Me 262 for one regular unit in each of the following quarters also. Jet units that have been destroyed may be rebuilt during the next quarter as long as replacement factors are available. When he has finished swapping, in the last quarter, the German will find that he will have six Me 262's more than the order of battle calls for, but no more unit counters in action than are authorized.

### **Royal Air Force**

Each quarter, before German forces are placed on the board, the American player announces a RAF target. That city is destroyed if a 1,2, or 3 is rolled. If the RAF attack is made against a base, that base will be unusable in that quarter. The RAF can bomb only targets in Germany and Austria. The RAF attacks once each quarter, even if no American attack occurs.

### **Fighter Shuttles**

A. Fighters with enough fuel may Shuttle to Russia. The Shuttle is planned in the same manner as a bomber Shuttle. When exiting through the squares numbered "3," the fighter unit must have at least 3 turns remaining in the air. It must have 4 turns, or more, left when exiting through a square numbered "4."

B. Return Shuttles are also planned in the same manner as are bomber returns.

C. When a fighter unit appears on a numbered square in returning, it is considered to have been in the air that many turns. For example, a fighter entering on a square numbered "7" has been in the air 7 turns to get there, and its AIRCRAFT TIME piece is placed accordingly.

D. The squares numbered "9" near Kiel and Rostock cost 9 air turns. Because 9 turns are used to reach these squares, one might assume that entry through them cannot occur before Turn No.9, but this is not true. Entry can occur any time after Turn No.2, but the amount of fuel used to reach them must be accounted for when placing the AIRCRAFT TIME piece on the time record.

E. Returning fighters can provide close escort to returning bombers, or they can fly a normal sortie.

F. Fighters may use Russia as a home base the same as the bombers may.

G. If all Shuttling fighters are eliminated, no more fighters may be Shuttled. Bomber Shuttles may continue, however.



# Optional Games

## German Aircraft Production

The Tournament and Advanced Games give the German one Replacement Factor for every 3 or 4 unbombed aircraft factories which survive a quarter. While this is the historically accurate rate of aircraft production, it gives the Germans the edge. For a more balanced and challenging game, change German production so that he needs 9 unbombed factories to make one Replacement Aircraft Factor.

## Ignore Escort Fighters

Goering demanded that his fighters ignore the escorting fighters and go directly for the bombers. The rules of our game prevent the German player from making Goering's mistake. However, to see what would happen if Goering were still in command, change the rules so that no German unit may attack allied fighters if there is a bomber within range which can also be attacked. Furthermore, when attacking bombers which have a close escort, the American escorts fire first and extract casualties from the German attackers before the Germans are permitted to trade shots with the bombers. When operating with these handicaps we recommend that the German player use the rates of production specified for the unaltered Tournament and Advanced Games (one Replacement Factor for every 3 or 4 unbombed aircraft factories).

## Jets

The Advanced Game rules show what would have happened if Hitler and Goering had not delayed the jet development program. To recreate WWII as it really was, ignore the rule which permits the Germans to substitute jets for operational units in Jan. '44. Hitler ordered all new aircraft development discontinued back in 1941. Jet development was continued in secret in spite of orders to the contrary. To simulate what would have happened if Hitler had been obeyed, use FW190's, instead of ME262 jets, to replace one unit each quarter starting in Jan. '44. Also use FW190's in place of regularly scheduled jet units.

## Strategic Target Complex Variant: Industrial Complexes

Write the word "Armaments" on one counter, "Ball Bearings" on another, etc. until you have eight counters each with the name of a complex listed on the Target Sheet key. The German player draws one at the beginning of the game and keeps it a secret from the American player until all the targets within that complex have been destroyed.

In the quarter following the destruction of all the factories within the critical industry, all Luftwaffe planes are grounded and only AA Guns may be used to defend the remaining unbombed cities.

When using this variant, a roll of 1, 2, or 3 on the die forces the German to reveal one of the complexes which is *not* the key industry. The die is rolled after each quarter (even those in which there is no raid), and the German player decides which of the remaining complexes to name as not being the key industry before the American plans that month's raids.

After American and German forces are in starting positions but before either side makes any movements, the German player rolls to see what his spies can tell him about American dispositions. If a 1, 2 or 3 is rolled, the American must immediately remove all dummy counters from play for that quarter.

## Short Game: Operation Custer

### A. 'How to Win

1. The American player wins by destroying at least 14 oil targets *and* keeping his losses at less than double the German's (compute this by the number of factors).

2. The German player wins if 13 or less oil targets are destroyed *and* American losses are at least double those of the German.

3. The game is a draw if the results are other than the above.

B. Game length is one quarter (20 turns).

### C. Luftwaffe Order of Battle

5 Ju 88  
11 Me 109  
1 Me 110  
1 Me 163  
7 Fw 190  
1 He 219  
2 Me 262

### D. American Order of Battle

9 B-17 5 B-26  
12 B-24 1 P-38  
1 B-25 10 PA7  
2 A-26 11 P-51

American planes may begin behind the 1945 Start Line and use sneak raids.

### How To Play

#### Solo Games

A. The Basic Game and Operation Custer are ideally suited for solo games. Although we recommend that you use our Play by Mail mapsheets, which are much larger, the small mission planning maps on the back of the Target Sheet can be used if you write carefully enough.

B. Use colored pencils to draw out the bomber movements for the first turn of the game and show when fighters are flying close escort or are to appear on the start line. Each succeeding move of the game is drawn on a separate sheet. When the entire mission has been written out in this manner, put the sheets into an envelope and draw up a second, third, and fourth raid. Then shuffle the envelopes and play the Germans live against one of the plans which you have selected at random. Once American fighters appear on the start line, you will move them to those areas where they will be most effective; make decisions for the American fighters so that they will give the best account of themselves.

C. To increase the number of American operations against which you may play, record the movements made during live games and file them away for later study and solo games.

### Experimental Option

Extra He 162 and Me 163 counters have been included with each game so that players who like to experiment can try games where

the Germans developed the Me 163 first rather than the Me 262. He may also try using the He 162 in place of the Me 262 for another variation.

### Speedy Set-Up

Set-up time can be diminished considerably by writing a small No. 1 on all pieces that enter in the Jan. '43 quarters. Pieces entering during the Apr. '43 quarter should have a small No. 2 on them, and so forth. Having a small, quick reference number like this readily available can save as much as 1) minutes when setting up the game.

## Hints on Tactics

### HINTS OF TACTICS FOR THE GERMAN

Generally speaking it is better to have at least one FW 190 guarding the Italian front while the bulk of your Fw 190's guard the British area. The Fw 190's should be sent to oppose the P 51 's because this forces them to prematurely drop tanks.

When opposing large stacks of bombers it is wiser to wait until you can hit them with a larger force than it is to plunge into battle with the few elements that might be close at hand.

Fighters of inferior evaluations such as the Ju 88 or Me 110 can derive some protection by flying in the same squares as Fw 190's. Techniques for winning the Basic game are not necessarily best suited for winning if) the other versions. In the other versions of the game it is generally better to go for the enemy fighters first because this will keep your own losses low. In the basic game it frequently pays to go directly for the bombers and take your lumps from the American fighters.

When jet fighters are present, they can provide an excellent protective umbrella against American counter attacks by stacking all your units into the same square. Whenever possible, try to arrange your position at the end of a move so that the Americans have to pass over a city to reach you. If you can delay engaging P47's until they are at least 8 squares from the R line, it

will diminish the number of turns they can stay and dogfight.

School units are too valuable to risk losing in dogfights, but they can be used to guard the Baltic sea squares and Russian front. Keep a few of the lower E rated planes, like Ju 88's, near the school units so that they can be used as cannon fodder if the return fire from bombers calls for casualties.

#### HINTS ON TACTICS FOR THE AMERICAN

If the German can anticipate your intentions soon enough, you will lose. You must strive to maintain the element of doubt in his mind as long as possible.

Baltic Sea raids can be very effective, but only when unexpected. If you run the same number of raiders thru the Baltic sea each quarter, you'll find them completing fewer assigned missions because the German is learning to cope with the problem. By skipping the Baltic Sea option a few quarters, you'll have tied up German forces which could have been used more effectively elsewhere.

Although massed bomber stacks provide maximum mutual protection, they also betray your intentions. They move so slowly that the German reaction to their presence is difficult to avert. An occasional sally by 3 or 4 bombers at staggered intervals from England or Italy keeps the German wondering whether or not a Baltic Sea raid will be attempted later.

Occasionally a heavy bomber or two should be given a base attack mission and sent along with the stack. This shakes the German up and if done often enough may cause him to prematurely break off combat so his fighters can refuel well clear of the bomber range.

One P-51 flying close escort for a stack of bombers frequently turns the brunt of a brutal attack into something less devastating. Low E rated planes like the P-39 and P-40 serve better as close escort cannon fodder than as dogfighters. Particularly when under the protective umbrella of a P-51.

When opposing Fw 190's, it is wise to

drop the tanks off the P-51. This forces the German to do likewise or fight at a disadvantage.

Whether he drops or not, your P-51 will still have more turns in the air than he. The easiest way to deal with the Jet menace is to destroy their bases or strafe them while they try to refuel.

The most successful bomber missions will be those whose flight path most closely resembles a rocket on the 4th of July. All the bombers fly together as long as possible and then suddenly the entire stack breaks up with each bomber traveling a very short 2 or 3 squares to its assigned target.

Occasionally a fast B-25 or B-26 can succeed where a massed stack of B-24's failed to penetrate, particularly if it starts out a few moves later and travels alone.

Strafing a base is always worthwhile. The odds are in your favor that you'll cause more damage than you receive.

#### SECOND PRINTING

This folder reflects a second printing. Go over them carefully with your opponent as certain rules changes and revisions shown here are not shown in the first edition.

If you have a Target Pad with a central column heading UNIT-TURN, change heading to read UNIT-QUARTER. The heavy numbers which follow unit identification numbers show earliest *Quarter*, not Turn.

Inquiries to questions on play will be answered upon receipt of a self-addressed envelope bearing first class postage.

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**8090001**

# The Planes: Profiles & Data

**B-17G Boeing Flying Fortress**



Crew	ten
Max speed	300 mph at 30,000 ft.
Cruising speed	160 mph
Service ceiling	35,000 ft.
Max range	1,850 miles
Armament	Thirteen 50 caliber machine guns; up to 17,600 lbs. of bombs over short ranges.

This rugged veteran was the backbone of the Army Air Corps. It was able to absorb tremendous punishment and could fly on one engine.

**A-20G Douglas Havoc**



Crew	three
Max speed	317 mph at 10,000 ft.
cruising speed	272
Service ceiling	25,000 ft.
Normal range	1025 miles
Armament	nine 50 caliber machine guns or 5 fifty caliber and 4 20-mm cannon; up to 2,000 lbs. of bombs internally and an additional 2000 lbs. externally.

The Havoc served as an attack bomber, night intruder and night fighter.

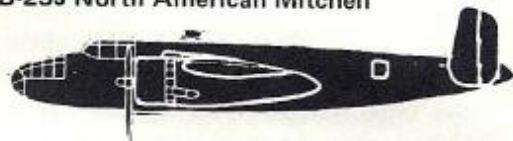
**B-24J Consolidated Liberator**



Crew	twelve
Max speed	300 mph at 30,000 ft.
cruising speed	180
Service ceiling	28,000 ft.
Normal range	2,100 miles
Armament	10-50 calibre machine guns; 5,000 lbs. of bombs normally or up to 12,800 lbs. for short ranges.

This bomber was used by more units than the B-17. It was faster and could carry more bombs but could not withstand the same amount of punishment.

**B-25J North American Mitchell**



Crew	six
Max speed	275 mph at 15,000
Cruising speed	230
Service ceiling	25,000 ft.
Normal range	1275 miles
Armament	Thirteen 50 caliber machine guns; up to 4000 lbs. bombs

It flew diversionary raids and provided direct support for ground troops as well as a few strategic missions. Jimmy Doolittle used B-25's to take off from the deck of an aircraft carrier and attack Japan.



### A-26B Douglas Invader



Crew	three
Max speed	373 mph at 10,000
Cruising speed	284
Service ceiling	22,100 ft.
Normal range	1400 miles
Armament	8 50 caliber guns and 4000 lbs. of bombs.

It served as a light bomber, night fighter and provided direct support for ground troops. It would have been produced in larger numbers if the war had not ended so soon.

### B-26G Martin Marauder



Crew	seven
Max speed	283 mph at 5000
Cruising speed	214
Service ceiling	19,800
Normal range	1100 miles
Armament	eleven 50 caliber machine guns & up to 4000 lbs. bombs

Although this medium bomber had lots of teething problems, it ultimately earned a lower attrition rate than any other U.S. aircraft.

### P-38L Lockheed Lightning



Crew	one
Max speed	414 at 25,000 ft.
Cruising speed	186
Service ceiling	44,000 ft.
Max range	2,260 miles with tanks 1085 without tanks
Armament	one 20-mm Hispano cannon and four 50 caliber browning machine guns; up to 4,000 lbs. of bombs or 10 five inch rockets.

It served as a long ranged fighter and fighter bomber. It was originally designed as a destroyer and is credited with destroying more Japanese planes than any other U.S. fighter.

### P-39Q Bell Airacobra



Crew	one
Max speed	385 mph at 11,000
Cruising speed	200 mph
Service ceiling	35,000 ft.
Max range	1075 with tanks 525 without tanks
Armament	one 37mm cannon and four 50 caliber machine guns & 1 500 lb. bomb

The airacobra was designed as a fighter and fighter-bomber. Although it was easily out-classed as a fighter, in air to ground operations it served without equal.



#### P-40N Curtiss Warhawk



Crew	one
Max speed	350 mph at 16,400 ft.
Cruising speed	282
Service ceiling	31,000 ft.
Max range	1,500 miles with tanks 750 without tanks
Armament	six 50 caliber browning machine guns and up to three 500 lb. bombs

It was designed as a fighter and fighter-bomber but served in the European theater as a ground attack aircraft. Like the P-39 it was out classed by most of the German equipment.

#### P-47D Republic Thunderbolt



Crew	one
Max speed	429 mph at 30,000
Cruising speed	350
Service ceiling	42,000
Max range	1800 with tanks 590 without tanks
Armament	8 50 caliber machine guns and up to 2,500 lbs. of bombs or 10 rockets.

More commonly known as the Jug, this sturdy workhorse served well as a fighter and a ground attack aircraft.

#### P-51D North American Mustang



Crew	one
Max speed	437 mph at 25,000 ft.
Cruising speed	362
Service ceiling	41,900 ft.
Max range	2,300 with tanks 950 without tanks
Armament	Six 50 caliber machine guns and up to 2,000 lbs. of bombs or 10 five inch rockets.

This was our best high altitude long range fighter. It helped win the air war over Germany.

#### SUPERMARINE spitfire Vc



Crew	one
Max speed	374 mph at 13,000
Cruising speed	322 mph
Service ceiling	37,000
Max range	1,135 miles with tanks 470 without tanks
Armament	two 20-mm cannon and four .303 machine guns. one 500 lb. or two 250 lb. bombs.

On loan from the R.A.F., these nimble fighters proved to be fine mounts for American pilots of the 4th, 31st and 52nd fighter groups.

### Ju 88G-7 by Junkers



Crew	three
Max speed	389 mph at 29,800 ft.
Cruising speed	270 mph
Service ceiling	28,800 ft.
Max range	1400 with tanks 100 without tanks
Armament	four forward firing 20-mm MG 151 cannon. One rearward firing 13-mm MG 131 machine gun and two 20-mm MG 151 firing obliquely upward

This plane proved itself to be one of the most versatile in the German arsenal. It served as a bomber, cargo plane, reconnaissance, ground attacker and night fighter.

### Bf 109G-6 by Messerschmitt



crew	one
max speed	387 mph at 22,970 ft
cruising speed	260 mph
Service ceiling	38,500 ft
maximum range	615 with tanks 348 with- out tanks
Armament	Two 13-mm MG 131 m machine guns, one engine- mounted 20-mm MG 151 cannon and two 20-mm MG 151 cannon mounted under the wings.

The Me 109 lead a long and useful career in Luftwaffe service. When its performance was exceeded by allied aircraft, it was used against the Russians with great effectiveness.

### Bf 110G-4 by Messerschmitt



crew	three
max speed	342 mph at 22,900 ft
cruising speed	301 mph
Service ceiling	26,000 ft
maximum range	1305 miles with tanks 565 without tanks
Armament	two 30-mm MK 108 can- nons, 2 20-mm MG 151 cannons and two 7.9-mm MG 81 machine guns firing rearward.

This fighter served as a bomber destroyer, long ranged fighter escort, ground attacker and night fighter. It was used much longer than intended because its replacement, the Bf 210, developed too many bugs to be practical.

### Ta 152H-1 by Focke-Wulf



crew	one
max speed	472 mph at 41,000 ft
cruising speed	372
service ceiling	48,560 ft
max range	745 miles
Armament	one 30-mm Mk 108 can- non and two 20-mm MG 151/20 cannons

This outstanding fighter was a further develop-  
ment of the Fw 190. Although it saw very  
limited service, it clearly outperformed all  
conventionally powered allied fighters.

### He 162A-3 Salamander by Heinkel



crew	one
max speed	522 mph at 19,700 ft
cruising speed	307
service ceiling	36,000 ft.
max range	410 miles
Armament	two 30-mm MK 108 can- nons

This fighter went from drawing board to flight  
test in 69 days. It was made of cheap non-  
strategic materials and was supposed to be a  
low cost replacement for the me 262. During  
several flights, the aircraft literally came un-  
glued.

### Me 163B-1 Komet by Messerschmitt



crew	one
max speed	596 at 10,000 to 30,000
service ceiling	39,500 ft.
max range	8 minutes of powered flight
armament	two 30-mm MK 108 cannons

The komet was as dangerous to German pilots as it was to Americans. It was very touchy and accidents were common. They occasionally exploded during takeoff or landing.

### Fw 190A-8 by Focke Wulf



crew	one
max speed	408 mph at 20,600
cruising speed	298
service ceiling	37,400 ft.
max range	807 miles with tanks 520 miles without tanks
armament	two 13-mm Mg 131 machine guns and four 20-mm Mg 151 cannons

This outstanding fighter fought thru 1943 and was later replaced by the Fw 190D. Both versions were clearly superior to most allied aircraft.

### Do 217N-2 by Dornier



crew	three
max speed	320 mph at 18,685 ft
cruising speed	292 mph
service ceiling	29,200 ft
max range	1550 miles
armament	four 20-mm MG 151 cannon and four 7.9 mm MG 17 machine guns

A serious shortage of nightfighters and intruders caused this bomber to be converted to those purposes. They were radar equipped and served well.

### He 219A-7 UHU (Owl) by Heinkel



crew	two
max speed	416 mph at 22,965 ft
cruising speed	335 miles
max ceiling	41,660
max range	1243 miles
Armament	two 30-mm MK 108 cannon in wing roots, two 30-mm MK 103 cannon & two 20-mm MG 151 cannon in ventral tray and two 30-mm Mk 108 cannon firing obliquely upwards.

This was the finest night fighter produced during the war. Allied bombardment, labor and political problems kept it from greater production.



#### Me 262A-1 by Messerschmitt



crew	one
max speed	540 mph at 19,684 ft.
cruising speed	440 mph
service ceiling	36,565 ft.
max range	652 miles
armament	four 30-mm MK 108 cannons

**This fighter was the most successful example of German genius. It almost turned the tide of air to air combat.**

#### Me 410B-2/U2 Hornisse (Hornet) by Messerschmitt



crew	two
max speed	388 mph at 21,980 ft.
service ceiling	34,800 ft.
max range	1,450 miles
armament	six MG 151 20-mm cannons and two 13-mm MG 131 Machine guns firing backward.

**This plane served as a light bomber, ground attacker and destroyer. It was rushed into production when the Me 210 proved itself unsuitable.**

#### De 520 by Dewoitine



crew	one
max speed	334.7 mph at 23,030 ft.
cruising speed	248 mph
service ceiling	36,080 ft.
max range	956 miles with tanks, 553 without tanks
Armament	one 20-mm Hispano-suiza HS 404 cannon and four wing mounted 7.5mm 1934-M39 M.A.C. machine guns

**This fighter was captured from the French and used by Luftwaffe school squadrons. It was slightly slower than the Me 109 but more maneuverable.**