

## LUFTWAFFE FOR THE 90'S; UPDATING THE WWII STRATEGIC AIR WAR GAME

by Alan Arvold

Back in 1971 Avalon Hill came out with the game *LUFTWAFFE*, its game about the strategic air war over Germany during the last two and half years of World War II. *LUFTWAFFE* is another one of those games that have stood the test of time and remains in print even after 25 years. Indeed the game is one that many gamers own but rarely ever play any more. And why is this? Well there are several reasons. For one, some of the rule mechanics are rather dated even though the whole concept of the game is sound. For another reason the game in different stages tries to simulate all three levels of warfare, strategic, operational, and tactical. While the strategic and the operational stages are obvious, the tactical stage is not. The tactical stage can be found in the turn sequence, first one side moves and fires his units, inflicting losses upon his opponent, and then the other side does the same just like in *PANZERBLITZ*, another game introduced about the same time as *LUFTWAFFE*. This leads to both sides massing their units in large stacks and then trying to get the jump on each other early in the game because which ever side gets in the first shot, inflicting heavy losses with no losses to themselves, usually dominates the rest of the game (or quarter if playing a campaign). While this may work in depicting tactical armored warfare, it does not work when depicting air battles especially in an operational level game. Still another reason is that the game oversimplifies the effect that the bombing had on the German economy and industry. In games like *ADVANCED THIRD REICH* this oversimplification fits in nicely because strategic bombing is only part of the greater whole. But in *LUFTWAFFE* strategic bombing is the whole game.

With all these reasons one might say its time for a new game about the strategic bombing in Europe during the Second World War to be designed and developed. Perhaps. But with the few cheap examples that I have seen lately I am not impressed. The answer it seems then is to further develop a proven system. But why further develop a system if its already proven. Well what was state of the art in wargames in the 1970s is somewhat outdated today. Still one must be careful what one changes and what one leaves in a game. To this end I have read through the articles done on the game *LUFTWAFFE* both in the *GENERAL* and in other wargaming periodicals. While there were plenty of articles to review from the 1970s, from the 1980s there were few and none have been published in the current decade. From these I saw what these other authors did to correct some of the faults of the game. Some of these ideas I liked and have incorporated them in a modified form into this variant. To these authors who blazed the trail before me in improving *LUFTWAFFE* such as Norman Beveridge, Robert Harmon, Kenneth Erber, and Michael Anchors I thank very much for the inspiration their variants gave me.

Because *LUFTWAFFE* is a game that is divided up into different levels of complexity in its Basic, Tournament, and

Advanced games, with Optional Rules in various places, the rules which I will present will be divided up in the same manner. As always I will put the rule in the proper section in the rules under the correct numbered sub-section or into a new numbered sub-section as the situation requires. All regular rules in the game still apply except where changed or superseded in this article.

### BASIC GAME

As mentioned before one of the biggest problems of *LUFTWAFFE* was the problem of combat resolution as dictated by turn sequence. Whoever got in the first big attack with a stack of fighters usually dominated the rest of the game or quarter, especially if the defending stack was a group of fighters. The defender never got a chance to shoot back before bidding his lost fighters goodbye. In reality defending fighters would immediately go into a dogfight with the attackers, giving as well as they got before the combat was determined. In the game the answer to this is defensive fire. Bombers already have this as their armament and combat formations are defensive in nature anyway. But fighters rely on speed, maneuverability, and pilot skill to bring their guns to bear upon the enemy. They do not stay in formation like ducks in a row receiving fire until it is their turn to fire as the game implies. Thus was born these rules for defensive fire.

### Game Procedure

**E.** Should read; American aircraft units may fire back with defensive fire at this time.

**O.** Should read; All fighter combat caused by the American movement is resolved. Only those American fighters which did not use defensive fire earlier in the turn may fire. German fighters which did not fire earlier in the turn may now use defensive fire.

### Fighter Missions

#### C. Close Escort

**4.** Should read; Close escorts that must discontinue protection because of fuel may not strafe or dogfight during their turn on the way back to the R line. They may defensively fire if attacked during the enemy player turn while on the way backthough.

### Combat

#### B. How to have combat

**5.** Should read; No unit may fire more than once per turn. American fighter units which defensively fire during the German half of the turn may not fire during the American half of the turn. German fighter units which fire in their half of the turn may not defensively fire during the American half of the turn.

**6.** Should read; After the attacker has rolled for each attack, the defender may roll first for his fighters and then for his

bombers defensive fire before losses are actually taken. Casualties are then taken from each side's respective stacks.

#### C. Fighter vs bomber

**Add 7.** If in a battle the number of German fighter factors exceed the number of bomber factors involved, the German player may withhold any number of fighter factors in his stack from this combat that are in excess of the number of bomber factors. These fighter factors may not fire during this combat but they do not take losses either as a result of the combat. The German may choose which fighter units he wishes to withhold.

#### D. Fighter vs fighter

**7.** Should read; Losses are taken as soon as all fire, both offensive and defensive, are finished for that half of the turn. Players may want to separate their lost factors before all fire is done for that half of the turn lest they forget to later on, but these factors may fire before they are considered to be lost.

**Add 8.** If in a battle one player, regardless whether he is the attacker or defender, has more fighter factors than the other player, that player may withhold any number of fighter factors in his stack from this combat that are in excess of the number of fighter factors that are in the other players stack. These fighter factors may not fire during this combat but they do not take losses either as a result of combat. However those fighter factors left in the combat must meet the "best against the best" limitations as put forth in the previous parts of this section.

#### E. Fighter vs fighter and bomber

**Add 4.** Close escort fighters may fire defensively before taking losses. German losses are first extracted from the fighter factors that attacked the close escort before being extracted from the fighter factors that attacked the bombers.

**Add 5.** If in a battle the German player has more fighter factors than the total number of American close escort fighter factors and bomber factors, the German player may withhold any number of fighter factors that are in excess of the total number of American factors. These fighter factors may not fire during this combat but they do not take losses either as a result of combat. However those fighter factors left in the combat must meet the "best against the best" limitations as put forth in the previous parts of this section.

**DESIGN NOTE:** The inclusion of defensive fire makes the aerial combat in this game truly attritional now. No longer does the player who gets in the first big attack with his fighters hold the upper hand for the rest of the scenario or quarter. The rule that allows the player with more fighter units in a battle to hold back some of them from the fight is intended to prevent the unrealistic tactic of the German player sending in a one or two factor fighter unit into an American fighter group during his half of the turn, forcing all of the enemy fighters into using defensive fire so they can not fire offensively during their half of the turn. It also allows the German player to hold back some of his fighters in his groups during his attacks in order to give these groups some defensive fire capability during the American half of the turn.

### Optional Basic Game Rules

**A.** Add after first paragraph; It is also admittedly unrealistic for German fighters of the same type located in different parts of the map to have to take off and land at the same time, plus waiting for all planes of their type to refuel before taking off again. (**EXAMPLE: Me109s in Austria and Hungary guarding against American groups coming from Italy would not take off just because some American bombers were coming in from the Baltic Sea.**) Thus the German player may individually record the take off, landing, and refueling of each of his fighter units. While the increased bookkeeping may not be a problem in the Basic Game or in a single raid scenario in the more advanced versions, in the campaign games presented in the Tournament and Advanced versions the bookkeeping may well become a nightmare in the latter part of the game. To get around this the German player may divide his fighter units of the same type into separate groups, with each group having all the fighter units in it taking off, landing, and refueling at the same time. These groups could be in separate parts of the map each defending that section or be centrally located to facilitate attacking the American groups in waves.

### TOURNAMENT GAME

In the Tournament Game we were introduced to the Campaign Game of LUFTWAFFE. The main fault in this game is the American Replacement limit. While the original replacement limits are based on the actual losses incurred by the US 8th and 15th Air Forces during the campaign, these limits do not take into account the accumulated replacement planes and pilots/crews that were available but never used. On VE Day on 8 May 1945 there were several thousand replacement planes available both in Britain and in the United States (earmarked for Europe) to replace losses at that point in the war. There were also just as many replacement pilots/crews, both newly trained just out of school and combat veterans who were coming over on their next combat tour. The original limits made for some ahistorical games where there was not much happening during the first four quarters (1943), very heavy action during the next four quarters (1944), and mopping up action during the last two quarters (1945) where a shrinking American force is doing battle with a still growing German one. It's true that the original limits made for a finely balanced game but it was so finely balanced that one bad quarter for either side would ruin the rest of the game for them. The revised American replacement rate will correct this deficiency.

#### Jets

**B.** Should read; Jets may attack in one of two ways:

1. They may attack the close escort fighters and the bombers together as in the basic game. The escort fighters will get opportunity for defensive fire before the bombers are attacked by the jets.
2. They may ignore the escort fighters and attack the bombers directly. The escort fighters will get an opportunity for defensive fire only after the attack on

the bombers have been resolved. In either case all jet related combat and defensive fire is resolved before non-jet attacks are resolved. American fighters which defensively fire against German jet units may not use defensive fire against German non-jet units during the same turn.

**F.** Should read; When the Me163 attacks enemy fighters, their E ratings are ignored. American fighters may not use defensive fire against the Me163 unit. If the American fighters are defensively firing against a group of German jet units of which the Me163 unit is part of the group, the Me163 unit may not take losses even if the rest of the jet units are destroyed.

**DESIGN NOTE:** German jets because of their speed could choose who they wanted to engage in aerial combat. However when they attacked bombers they had to slow down a bit in order to effectively shoot at the bombers. While they were still going too fast for the bombers defensive fire to effect them, their slower speed did allow the escorting fighters to catch up to and engage them after they did their damage to the bombers. The Me163 is an exception to this because being a rocket fighter, it had no control over its speed so it went in, fired its load, and got out of the area. American fighters could never catch up to it in the air, they had to get it while it was taking off, landing, or just sifting on the ground.

**Replacements**

**B.** Should read; The American player has a fixed rate of replacement each quarter. These may be used to place back into the game lost and reduced units at the cost of one combat factor for each replacement factor. Unused replacement factors may be accumulated from quarter to quarter.

Quarter	Replacement Factors
Jan. 43	15
Apr. 43	15
Jul. 43	20
Oct. 43	20
Jan. 44	30
Apr. 44	30
Jul. 44	35
Oct. 44	35
Jan. 45	40
Apr. 45	40

**DESIGN NOTE:** This gives the American player a total of 280 replacement factors to use in the game. The sharp rise in the replacement rate from Oct. 43 to Jan. 44 was due to the US Army Air Force’s commitment to the destruction of the German Luftwaffe in the air through attrition and they were prepared to replace the anticipated high losses, something they were not quite ready to do during 1943.

**ADVANCED GAME**

Now we get into the version where there is less correction of previous faults and more introduction of new ideas not previously mentioned before. Note that the Movement Section is an add on as the Advanced Game does not have this section.

**Movement**

In 1943 American fighters do not carry droppable external fuel tanks. Therefore during the first four quarters of the game when American fighter units cross the R line, the number of turns that they may spend in the air before having to recross the R line is equal to the right number on their respective Aircraft Time Counters. Starting in the Jan. 44 quarter all American fighter units may use their drop tanks.

**DESIGN NOTE:** The truth of the matter is that in 1943 American fighters had smaller drop tanks. These only allowed them to get to the coast of Belgium or the Netherlands before running out of fuel. In game terms this approximately equals the 1943 R line. Thus when they cross the R line in 1943 in reality they would have already dropped their now empty external fuel tanks. The bigger drop tanks that allowed for long range escort missions were not introduced into service until the end of 1943.

**Combat**

**Add F.** The German player may now uprate some or all of his fighter units to “bomber killer” status. At the beginning of each quarter before setting up his units on the mapboard, the German player will mark those fighter units on his Target Sheet which have this status. This status remains in effect for those fighter units for the whole quarter. The German player may change the status of each of his fighter units between quarters. The “bomber killer” status bestows upon German fighter units the following attributes;

1. It gives a plus one (+1) die roll modifier to the die roll of those fighter units during combat resolution. (A die roll of 6 still equals 6.)

2. It causes the E rating of those fighter units to be reduced by one. (**EXAMPLE:** A FW190 fighter unit with “bomber killer” status would have an E rating of three, not four as it normally has.) This reduction is in addition to the reduction for keeping on the drop tanks during combat. In cases in combat where the German player is attacking with a group of aircraft of the same type, some with “bomber killer” status and some without, he must roll twice for that type of aircraft. The first roll is for the number of factors without “bomber killer” status and the second roll for the number of factors with the status.

**DESIGN NOTE:** During the campaign the Germans tended to overarm their fighters with extra rockets, missiles, and cannons when fighting against the US bombers. While this made their fighters more effective against bombers, it also made them sluggish and less maneuverable, qualities which were not detrimental when fighting enemy bombers but very detrimental when fighting enemy fighters. This was why the US long range fighters devastated the German fighter formations during the early months of 1944. The Germans soon corrected for this by stripping down their best fighters, usually the FW190s, to their basic armament and using them to combat the US escort fighters while their overarmed fighters went after the bombers. (Historically when they implemented this correction US fighters had become so overwhelming in numbers that it did not make much difference.)

**Reinforcements**

**B. German Reinforcements**

2. Delete last sentence. Add the following sentences: School units may not be held off the board. They may receive replacement factors to retrieve lost or reduced school units. School units that are swapped for jet units may not be replaced during the quarter in which they are swapped.

**Replacements**

A. As in the Tournament Game the American player has a fixed schedule of replacements. These follow the same rules as in the Tournament Game.

Quarter	Replacement Factors
Jan. 43	15
Apr. 43	15
Jul. 43	20
Oct. 43	20
Jan. 44	40
Apr. 44	40
Jul. 44	45
Oct. 44	45
Jan. 45	50
Apr. 45	50

**DESIGN NOTE:** This gives the American player a total of 340 replacement factors. The increase of factors in the last six quarters are the replacements for the tactical air forces.

B. The German players no longer receives replacement factors. Instead he receives aircraft factors to replace the lost aircraft and pilot factors to replace the lost pilots and crews to fly them. It costs one aircraft factor and one pilot factor to bring back one combat factor from the dead pile. Each of these factors may be accumulated from quarter to quarter if not used in the quarter they are produced.

1. The German player receives one aircraft factor per quarter for every three unbombed aircraft factories. Fractional aircraft factors are not dropped, they are retained so that they may be combined with fractional aircraft factors produced in future quarters to make whole factors.

2. The German player receives 12 pilot factors per quarter. This number may not be increased but can be reduced for the following reasons.

a. The number is reduced by one for every two combat factors of school units that were lost that quarter.

b. The number is reduced by one for every two combat factors of school units that were lost in previous quarters and not replaced.

c. The number is reduced by one for every two combat factors of school units that are swapped for jet units.

**DESIGN NOTE:** The German replacements factors were broken down into two parts because each part was affected in different ways during the campaign. Aircraft production was affected by the bombing. Pilot and crew training was effected by the US fighter sweeps that were conducted through out Germany during the last year of the war. (School units were a high priority target for the US fighter sweeps.)

**Jet Production**

Should read; Starting in the Jan. 44 quarter the German player rolls the die at the beginning of his turn. If he passes the die roll he may start substituting one Me262 unit for any unit that is scheduled to enter during that quarter (except school units). Once he passes his die roll he does not have to roll for jets again during the game. He may swap a Me262 for a 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 aircraft and pilot factors are available. When he has finished swapping in the last quarter, the German will find that he has as many as six Me262's more than the order of battle calls for, but no more unit counters in action than are authorized.

Quarter	Die Roll
Jan. 44	1
Oct. 44	1,2
Apr. 44	1-3
Jul. 44	1-4
Jan. 45	1-5
Apr. 45	Automatic

**DESIGN NOTE:** This rule is a compromise between the original rule and the optional rule that allows the German player no jets. Historically, Hitler ordered that the Me262 be made into a fighter-bomber in January of 1944. This delayed its introduction into the war (its combat debut was in July 1944) and then only as prototypes undergoing combat testing. Limited production occurred during the fall of 1944 to form the first units who in turn would become the training cadre for future jet fighter units but by then US fighters were on the look out for jets, engaging them whenever possible. By the end of 1944 US fighters were so massive in number that the US was able to station fighters on Combat Air Patrol over all known German jet air bases where they had the best chance of shooting down jets as they were taking off or landing. This rules allows the German player to change Hitlers mind, through the use of the die roll, in order to get jet fighter production started earlier than was the case. The reason that jet production is low is because of the difficulty the German industry had in mass-producing the turbo-jet engines needed for the jets.

**Royal Air Force**

Should read; Each quarter, before German forces are placed on the board, the American player announces a RAF target. The destruction of that city or base is dependent on passing a die roll based on the table below. If the target is a base it will be unusable for that quarter. The RAF can only bomb targets in Germany or Austria. The RAF attacks once per quarter, even if no American attacks occur.

A. The success of a RAF attack is based on the number of German nightfighter combat factors that were remaining on the board during the previous quarter, prior to replacements being used to bring back ones that were previously lost. (For the first quarter use the number of nightfighter factors in the initial German forces for that quarter.) German nightfighter units are those units that have the letters NJG in their historical designations.

**B. The number of Nightfighter factors**

Number of Nightfighter Factors	RAF Die Roll:
None	Automatic
1-4	1,2,3,4,or 5
5-8	1,2,3,or 4
9-12	1,2,or 3
13-16	1 or 2
17 or more	1

C. In quarters where the Germans receive nightfighter units with the same historical designation as one they received earlier, they must remove a nightfighter unit. (EXAMPLE: In Jan. 44 the Germans receive a Ju88 unit with the designation of NJG 2. The Me 110 unit to be removed must be a nightfighter unit.)

**DESIGN NOTE:** German nightfighter units pulled double duty during the war. Not only were they used against the RAF in their night attacks but were also used (day pilots flying) against the US bomber attacks by day. Due to increase of nightfighters; during the first half of 1944, the RAF's Bomber Command started taking heavier losses in their raids than they had ever experience before. It was not until the fall of 1944 that RAF bomber losses dropped appreciably due to the decimation of the German nightfighter units by US fighter sweeps and the fuel crisis which grounded most of the Luftwaffe. Therefore in the game, the more nightfighter units there are, the harder it is for the RAF to hit its targets.

**OPTIONAL GAME**

The Optional Games present several optional variants and scenarios. The scenario "Operation Custer" is a very good game in its own right. However the variants of No Jets, Reduced German Aircraft Production, and Ignore Escort Fighters have no place in the rules I have presented. While they may work well with the original rules, they will put a severe disadvantage if combined with these variant rules in this article. Thus I ignore them. The variant which I wish to replace is the Strategic Target Complexes. This variant is over simplified and does not truly represent the effects that the bombing campaign had on the Luftwaffe. In this variant the bombing of all the targets of one type of strategic complex grounds the Luftwaffe.

Historically, the bombing of each strategic target did have an effect on either German aircraft or oil production or both but the Luftwaffe continued to fly (in much lesser numbers and much less often) right up to the end of the war. Thus this revision and expansion of this variant which I will present here will give a much more historical representation of the American Strategic Bombing Campaign and its effects within the limits of the **LUFTWAFFE** game system. (To be honest, the Strategic Bombing Campaign never destroyed the German Industry as its proponents thought that it would. What the campaign did do was to bring German Industry down to the level where it could no longer adequately support the German war effort and keep it there. German recovery and repair capabilities were able to negate much of the damage and destruction the bombing had caused up to the middle of 1944. At that time the level of destruction caused by the bombing began to exceed the Germans' ability to repair and recover and war production finally

began to fall. The oil shortage and the disrupted transportation system further hastened the fall in production, but German industry continued to produce right up towards the end of the war when the allied armies overran the factories.)

**Strategic Target Complexes**

German targets are divided into four categories; oil targets, aircraft production targets, supporting industries targets, and transportation system targets. Each of these categories and their effects in the game will be described separately.

**A. Oil Targets**

1. Each Oil Refinery produces 10 units of fuel each quarter. Oil Refineries which have been bombed produce 0 units of fuel each quarter for the duration of the game. Fuel production for a quarter is computed at the start of each quarter.

2. At the beginning of each quarter the German player allocates fuel for each of his fighter units. Each fighter unit (2 factors) consumes 1 unit of fuel. Each jet fighter unit (Me262 and He162) consumes 1/2 of a unit of fuel. Each rocket fighter unit (Me163) consumes no units of fuel. (Reason: German jets used a low grade diesel oil for fuel instead of high grade aviation gasoline. Rocket fighters used chemicals for fuel which were supplied by the chemical industry.) One factor fighter units consume half the amount of fuel that a two factor unit does. The German player secretly records which fighter units are supplied with fuel at the beginning of the quarter. These units may then fly during the quarter, including taking off and landing several times during the quarter. Those fighter units which are not allocated any fuel are grounded for the entire quarter. At the end of the quarter the German player shows the American player his list of which units had fuel and which ones did not. (During the first six quarters of the game the German player can dispense with recording this information as he will generally have enough fuel for all of his fighters. Once the number of unbombed oil refineries becomes low enough to cast doubt as to whether he has enough fuel or not then the recording procedure should be enforced.)

3. The German player is not required to allocate fuel for all or some of his fighters if he does not want to even if the fuel is available. He may purposely leave some grounded if he wants to.

4. After all fuel has been allocated for the quarter the German player may then take up to 10 units of the remaining fuel and put it into a fuel reserve. All remaining fuel produced is then considered lost. (It's been sent to other Luftwaffe units in other combat theatres which are off the playing board and thus not in the game.) Fuel may be accumulated from quarter to quarter in this reserve. The German player keeps a record of the accumulated fuel from turn to turn. In the first quarter which the German player has insufficient fuel being produced to operate all of his planes he may start to withdraw fuel from his reserve to make up the difference. The German player does not have to use his reserves at this time, he may save them for later quarters, they just become available to him from this time forward.

**DESIGN NOTE:** In late 1942 the Luftwaffe started a fuel saving program with the intention of reducing fuel waste and creating operational fuel reserves. These reserves were quite large by the time the Americans started their oil bombing campaign in May 1944. With the reduction this caused in fuel production the Luftwaffe started to tap into its fuel reserves, exhausting them by September 1944.

5. Fuel production may be reduced by the bombing of oil refineries. Each bombed oil refinery reduces production by 10 units. In addition, fuel production may be halved if any of the following conditions occur;

- a. In the previous quarter the last of the chemical targets has been bombed. This causes the fuel production to be halved for this quarter only.
- b. In the previous quarter the last target of the entire German transportation system has been bombed. This causes the fuel production to be halved in every remaining quarter of the game.
- c. Fuel production may be halved twice for a quarter if both of the above conditions occur in the previous quarter.

6. When the last oil refinery has been bombed, starting in the next quarter the German player has a residual oil production of 10 units per quarter for the remainder of the game. This production may be halved as noted in the previous section.

7. German nightfighter units which were grounded due to not being allocated fuel in the previous quarter may not have their factors counted in the total number of nightfighter factors used when resolving the RAF attack for the current quarter. In the first quarter of the game all German nightfighter units are assumed to have been fueled.

8. The number of pilot factors the German player receives during a quarter is reduced by one for every two combat factors of school units which were grounded during a quarter due to being allocated no fuel. This is addition to all other reductions. When swapping school units for jets, the German player may not swap school units which were grounded for no fuel in the previous quarter.

#### B. Aircraft Production Targets

1. Aircraft production targets are of course the aircraft factories.

2. In addition to having the number of aircraft factors produced per quarter reduced because of bombed factories, the number produced may be further halved under the following conditions;

- a. The last target of one or more of the following support industry types was bombed in the current quarter; Armaments, Ball Bearings, Chemicals, and Steel.
- b. The last target of one or more of the following transportation systems was bombed in the current quarter; Rail Centers, Shipping, and Transportation Centers.

3. The production of aircraft factors may not be halved more than once per quarter no matter how many times the above conditions exist in the same quarter. This halving only applies

for the current quarter only. Exception: When all targets of the entire transportation system are bombed then aircraft factor production is halved for the duration of the game. The halving of production is done after the number of aircraft factors for the quarter based on the number of unbombed aircraft factories is determined.

4. In the quarter that the German player has less than 18 unbombed aircraft factories remaining, the number of aircraft factors produced per quarter becomes six for the duration of the game, regardless if any more aircraft factories are bombed or not. This number can be halved by any of the conditions noted above.

**DESIGN NOTE:** After the Germans had lost more than half of their aircraft factories from the bombing raids of early 1944, they heavily dispersed their aircraft industry, placing many plants underground to protect them from the bombing and to ensure a steady supply of planes for the rest of the war.

#### C. Supporting Industry Targets

1. Support industries are the following target types; Armaments, Ball Bearings, Chemicals, and Steel. These industries support aircraft factor production and in the case of Chemicals also support e production.

2. If the last target of one or more of the support industries has been bombed during a quarter, aircraft factor production is halved for that quarter only. This may occur in as many quarters as these conditions apply.

**DESIGN NOTE:** As in aircraft production once the Germans realized that the allies were trying to knock out another production bottleneck within their industrial infrastructure, they would disperse the factories that comprised the particular industry that was the bottleneck. When the dispersal occurred aircraft production suffered a temporary reduction due to the reduced amount of materials coming from the industry in question. After dispersal was done the industry resumed production which lasted until the end of the war.

3. If in a quarter the last chemical target is bombed, in the next quarter fuel production is halved for that quarter only.

**DESIGN NOTE:** The chemical industry supplied the petroleum industry with the necessary chemicals to make synthetic fuel which comprised a large percentage of German fuel production.

#### D. Transportation System Targets

1. Transportation System Targets consist of the following target types; Rail Centers, Shipping, and Transportation Centers. While Rail Centers are self explanatory, Shipping and Transportation Centers need some explanation. Shipping targets were the dockyards and ports that built and serviced not only the German navy and merchant marine, but also the ships, boats and barges that used the great river systems that flowed through the Reich such as the Rhine and the Danube. Transportation centers were major hubs for Germany's trucking industry. (Actually Germany did not have a trucking industry as we know it in terms of the American trucking industry of the latter half of the 20th Century. Instead there was a governmental ministry that organized and controlled the majority of the trucks in Germany

during the latter half of the war to create another alternate method of transporting raw materials and goods around the country.)

2. During the quarter where the last target of one or two of the target types of the transportation system is bombed, the production of aircraft factors is halved for that quarter only.

3. If during a quarter the last target of the entire transportation system is bombed, the production of aircraft factors is halved for the duration of the game. In addition, starting in the next quarter the production of fuel is halved for the duration of the game.

**DESIGN NOTE:** As the Germans dispersed their industries to counter the effect of the bombing, a greater reliance was put on the transportation systems in order to get raw materials from their sources to the factories and to get major sub-assemblies to the main assembly plants to make the various weapon systems in the German arsenal. When the bombing began to disrupt the German transportation system, not only did this slow down the rate of production but also slowed down the rate with which the Germans could replace their losses in material at the front. It also slowed down the rate of fuel supply in the German war effort.

**Commentary:**

With the new version of the Strategic Complexes optional rule, players now have a better idea how the bombing campaign really played out. It allows the American player to try out different sets of target priorities from game to game. As these rules are used with the Advanced rules for *LUFTWAFFE*, the Americans now have the means to actively play out all the quarters of the game as he finds he must lay the foundation of his later campaigns during the 1943 quarters. However the American player must keep a few things in mind.

One, even though he has a greater number of replacement factors he still does not have enough to replace every unit every quarter of the game. While one bad quarter in losses will no longer lose the game for him, several quarters of heavy losses will.

Two, he still has the same victory conditions as before, bomb every target on the map. If after a masterful campaign of ten quarters he still fails to bomb one city, he still loses. (Historically this would not make much difference in the outcome of the war but the victory conditions are based on duplicating the actual American performance of the bombing campaign, not winning the war through bombing alone.) The German player also has more options than he has had before. He can now accumulate fuel and replacement planes and pilot/crews for the later quarters of the game when the sources of these items will have been bombed or destroyed. This will allow him to have a token air force towards the end of the game, most likely of jets, with which to make last stabs at the bombers in order to save one city.

**CONCLUSION**

As stated at the beginning of this article, *LUFTWAFFE* is a game in serious need of updating. The rules which I have presented here are aimed at just that. While all of these rules were designed to support the Optional Campaign game which I presented here, they were also made to stand on their own in the Basic, Tournament, and Advanced versions. It is my hope that these rules will help the game of *LUFTWAFFE* to survive into the next century.