THEATER MODIFICATIONS
More Expansions for B-17
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B-17, QUEEN OF THE SKIES is the game of high-altitude tension and roaring excitement. It nicely simulates the bombing operations carried out by the 8th Air Force based in England, or by the 15th Air Force based in Italy (Vol. 23, No. 1), during World War II. You, as player, are the aircraft commander; you must make the decisions regarding the fate of your B-17 and crew. It is, quite simply, the most fun you can have in solitaire gaming. It highlights the *adventure* in "Adventure Gaming".

But there are some shortcomings in simulating the real tension of certain facets of a mission. How good a formation flyer is the pilot? Is the target recognizable to the navigator and bombadier? Will your B-17 even make it to Zone 2 before a mechanical fault forces an abort? Questions like these plagued every B-17 commander, and have yet to be integrated into the game. I enjoy *B-17* immensely. But I also believe in tinkering with a game to make it even better. [*What wargamer doesn't?*] After some weeks of research and several pads of paper, I offer the following modifications for devotees to this great adventure.

GROUP FORMATIONS

When the B-17 first flew in combat against targets in Europe in August 1942, a six-plane squadron formation was used for combat. When a "bombardment group" (two or more squadrons) were sent aloft, the group formation had a lead six-plane squadron followed by the second squadron at a three mile distance. The other squadrons involved were spaced four miles apart at the midpoint between lead and tail squadrons. While risk of collision was low, the squadrons were usually unable to get a concentrated bomb pattern on the target or to support each other with defensive fire.

In September 1942, a new group combat formation was instituted, based on a nine-plane line-abreast squadron organization. The group formation consisted of a high squadron, with a lead squadron offset to the left and some 500 feet lower. While more compact than the previous formation, flexibility suffered. Collision risks were higher with pilots un-used to the rigors of formation flying (a specialized skill), and the fire from the waist gunners was greatly restricted to reduce the risk of hitting neighboring friendly aircraft. Also, in the early missions, aircraft aborts due to mechanical failure were so common that these formations were often terribly disrupted before even reaching the French coast.

Colonel Curtis LeMay, commander of the 305th Bombardment Group (Heavy), had noted the flaws in the group formations his men were using. Being new to the theater, he didn't immediately speak up against them. But after flying several practice flights and some combat missions, he introduced what would become known as the "high-lead-low" group combat formation. While harder to fly, demanding better pilots, the new formation was much improved in two respects. The gunners were able to fire in all directions unimpeded, or to concentrate defensive fire in a single direction if the need arose. And the bombing pattern was relatively compact, leading to more substantial damage to the target.

After reviewing this information on the early group formations, here are some proposed modifications to the rules of *B-17* for those who might wish to use these earlier formations to simulate the historical first missions:

1. Since group defensive fire, for the most part, will be ineffective against enemy fighters—when rolling for any fighters on Table B-3, ignore results of "16", "36" and "56" and roll again if not using the April 1943 formation.

2. With the August 1942 formation, bombing accuracy will not be as effective. Apply a "−1" modifier to the Table O-6 die roll.

EVASIVE ACTION

Upon initial entry into the skies above Europe by the B-17, the theory was that flying straight and level on the bomb run was simple asking for the flak guns to send you and your aircrew a personal invitation to join the *Luftstalags*—or worse. So evasive action by the formation was a standard tactic on the bomb run. While certainly good for morale, ther was one major drawback. Dropping bombs while jinking to evade flak sent the bomb-on-target accuracy rate way down.

Again, it was Colonel LeMay of the 305th who set the new standard for performance. He established the rule, and enforced it, that from now on evading flak on the bomb run was forbidden. On the very next mission, personally commanding his group, he flew a straight-in bomb approach.

No muss and no fuss, evading no flak bursts. It was a practical and effective solution. While flak damage to the airplanes rose, so did the accuracy rate. For those who, playing early scenarios, wish to recreate the dictum of evading flak in 1942 common to all pilots, here are the modifications:

1. While using evasive action, you may apply a "−2" modifier to the O-2 Flak Table die roll.

2. While using evasive action, you must apply a "−3" modifier to the O-6 Bomb Accuracy Table die roll.

FORMATION DEFENSIVE GUNNERY

Occasionally, the tight formations produced accidental hits on a B-17 by the guns of another. When rolling for enemy fighters on Table B-3, should a "16", "26", "36", "46" or "56" be rolled, roll one die and check for possible hits from friendly fire: "1-5"=no hits; "6"=hits. Should a "6" result, roll for number of hits and location using two dice and the table below:

Hits by Friendly Fire:	Location of Hits:
"2"=two hits	"2"=Nose
"3-11"=one hit	"3"=Pilot Compartment
"12"=two hits	"4"=Bomb Bay
	"5"=Radio Room
	"6"=Wing
	"7"=Waist
	"8"=Wing
	"9"=Tail
	"10"=Bomb Bay
	"11"=Pilot Compartment
	"12"=Nose

CREW EXPERIENCE

Another problem for the 8th and 15th Air Forces in those early days, one totally unforseen, was that of target identification. There was a significant difference in finding a town in America, with easy checkpoints on training runs, and finding one in war-time Europe where the close proximity of towns to each other and enemy action meant sometimes the wrong target got bombed.

Once again LeMay devised a solution. He started a "Lead Crew" school that taught teams of bombadiers and navigators to recognize certain sets of targets from the air. If a target that a particular "lead crew" was familiar with was selected for a mission, they were placed in the lead bombers on the belief that they would most readily recognize it—and thus that the entire group would bomb it with a reasonable chance of success. And it worked, as these specialists became an elite and important facet of the American effort. Modifications for recreating the impact of these lead crews are:

1. Anyone who has flown in the lead bomber position in the lead squadron at least twice against the same target is entitled to apply a "+1" modifier to the O-6 Table die roll.

2. Anyone using the lead crew concept can designate the target system they wish to use the bonus against (i.e., marshalling yards, industries, dockyards).

Pilot experience was a major factor in formation flying. Flight schools in the States had concentrated on the basics, and did not teach the finer points of flying, leaving indoctrination to formation combat flying to the group theater schools. Subsequently, the first few missions of a new pilot were somewhat riskier in terms of possible collision. Impliment the following:

1. Any novice pilot (five or fewer missions flown) must apply a "+1" modifier to the die roll of Event 12 of the Random Events Table.

2. Any veteran pilot (ten or more missions flown) can apply a "−1" modifier to the die roll of Event 12 of the Random Events Table.

Gunner experience was also a prime factor in air-to-air combat, when the bomber was beset by the enemy. Lack of adequate training Stateside led to some gunners who simply didn't understand the fine points of their guns, or how to use them effectively against oncoming fighters. After a

Figure 1: Three views of the August 1942 formation.

few missions (and intensive theater training), aerial gunnery always improved remarkably for those crewmen who survived. The modifications:

1. Any novice gunner (five or fewer missions) must apply a "−1" modifier to the M-1 Defensive Fire Table die roll.

2. With a novice gunner, an unmodified die roll of "1" jams his gun. A repair die roll of "1" clears the jammed gun and a "6" permanently breaks it; any other result has no effect. Only one repair attempt is allowed per zone entered, immediately after entry of that zone.

AIRCRAFT MODIFICATIONS

In the B-17E version, the nose gun was originally a .30-caliber light machinegun. It's drawbacks were obvious—a lack of range and insufficient hitting power. If flying the 17E, institute the following changes:

1. Due to lack of range, a "6" is required to hit an incoming enemy fighter on the M-1 Defensive Fire Table from the nose position.

2. Due to insufficient hitting power, a "−1" is to be applied to the M-2 Table die roll.

The B-17G had some, primarily defensive, changes made to it in design. While the chin turret was a major improvement, other changes were also implemented. Ammunition was increased by 50% for the cheek guns and 100% for the waist guns. The tail guns were fitted with an improved sight and given a better field of fire. Modifications for use of the B-17G in combat are as follows:

1. With ammunition increased by 50%, the number of shots by the cheek guns is changed from 10 to 15.

2. With ammunition increased by 100%, the number of shots by the waist guns is changed from 20 to 40.

3. With improved sights, a "+1" modifier is applied by the tail gunner to the M-1 Defensive Fire Table die roll.

4. Due to the improved field of fire, a "+1" modifier is applied to passing shots.

THE DAMAGE TABLES

The B-17F had extra fuel tanks installed in the wings, just outboard of the outer engines. These "Tokyo" tanks were susceptible to damage and fire. So, should #10 be rolled on the Bl-1 Wings Damage Table, roll one die to determine which fuel tank is hit: "1-2"=Tokyo tank; "3-4"=outboard tank; "5-6"=inboard tank. Damage is then determined normally.

Landing gear proved to be very vulnerable to damage. So when a "12"

is rolled on the Bl-1 Wings Damage Table, roll one die and apply the following:

"1-2"=Brakes out (h)
"3-4"=Landing Gear Inoperable (i) (j)
"5-6"=Landing Gear Drops Down (j) (k)

(h)="−1" modifier applied to roll on Table G-9.
(i)="−3" modifier applied to roll on Table G-9.
(j)=manual operation of gear: on a die roll of "1-2" gear raised/lowered; otherwise considered inoperable. One attempt per zone entered.
(k)=Speed reduced due to drag—two turns per zone

For extra-long range missions (Zone 10 or beyond), a fuel tank was occasionally carried in the bomb bay. Helpful as this tank was, it was not self-sealing. And the close proximity of aviation fuel and high explosives had many crews wondering about the benefits of the bomb bay tank. Should a "3", "9" or "11" be rolled on the P-3 Bomb Bay Damage Table while on a mission of extreme range, roll one die: "1-3"=check bombs normally; "4-6"=bomb bay hit and roll one die. A roll on this second check of "1-4" means "leakage", or of "5-6" means "fire" (immediate bailout of crew and loss of plane). If a leak occurs, should this section of the plane be hit again before the bomb run, roll one die: "2-5"=fire and bailout of crew; "6"=bombs explode with loss of plane and crew.

Bomb bay doors proved to be vulnerable to flak damage on the run in, as well as damage from fighters. Should a "5" or "10" be rolled on the P-3 Bomb Bay Damage Table, roll one die and apply the following:

"1-2"=Bay Doors Inoperable, jammed shut (c)
"3-4"=Bay Doors Inoperable, jammed open (c) (d)
"5-6"=Superficial Damage, no effect

(c)=manual operation of bay doors: on a die roll of "1-2" doors opened/closed; otherwise considered inoperable. One attempt per zone entered.
(d)=Speed reduced due to drag—two turns per zone.

WEATHER

Occasionally, the target designated was not able to be attacked, due to weather or other reasons. Hence, an alternative target was always selected for this contigency. Once you have determined your primary target, select an alternative target along the route to it as your secondary target.

In "poor" or "bad" weather, it didn't always mean that the weather was such that bombers couldn't hit the target. It often meant that the target was obscured by cloud cover, forcing a "timed bomb run" with a far greater chance for error and misses. So, when rolling for Weather along the route to and over the target, use the following modified table by rolling one die:

"1"=Clear conditions; apply "+1" modifier to rolls on Tables B-1, B-2, M-4, O-2 and O-6.

Figure 2: Three views of the September 1942 formation.
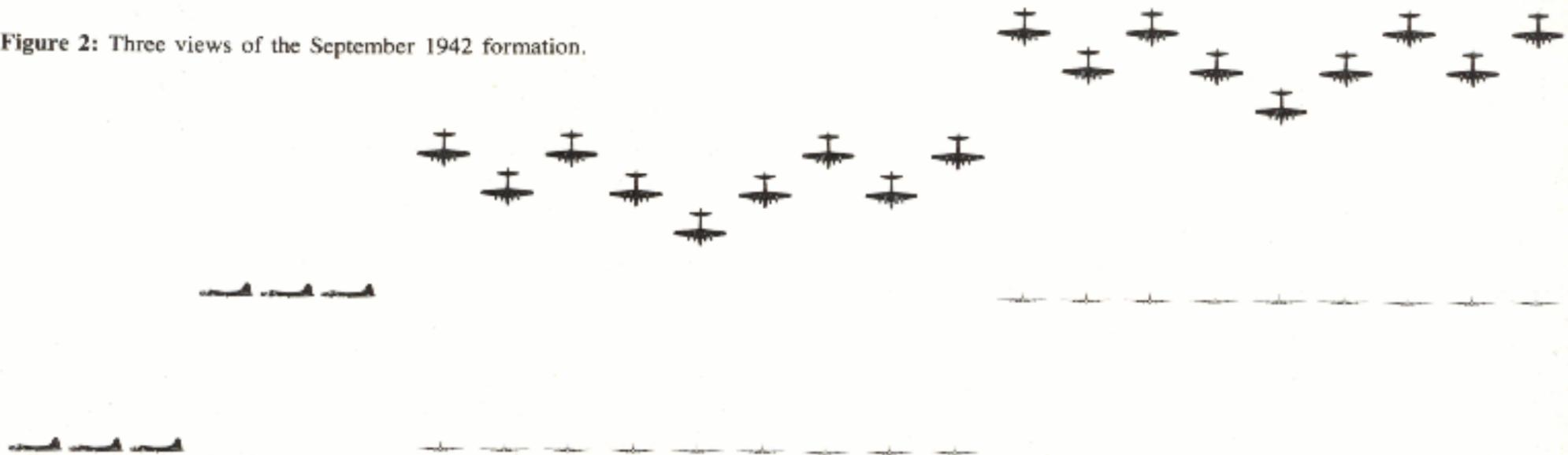
"2-3"=Haze conditions; no modifications apply.

"4"=50% cloud cover; apply "−1" modifier to rolls on Tables B-1, B-2, M-4, O-2 and O-6.

"5"=1000% cloud cover; apply "−2" modifier to rolls on Tables B-1, B-2, M-4, O-2 and O-6.

"6"=Storm conditions; bomber may abort. Alternate target may be attacked if desired but no fighter protection possible; apply a "−3" to rolls on Tables B-1 and B-2.

Weather over England also needs to be handled more realistically. While it could be clear for takeoff, the weather there often deteriorated in a few short hours to an alarming degree. Upon your return to England, make another roll for weather over the base and apply the following: "1-4"=poor weather; "5-6"=bad weather.

At certain altitudes under certain conditions, the engine exhaust of a B-17's four engines become visible to the naked eye. "Contrails" (as these came to be called) tended to attract enemy fighters and helped flak crews determine the bombers' altitude quickly. Upon reach Zone 2, roll one die: "1-4"=no contrails; "5-6"=contrails form. If contrails form, apply a "+1" modifier to the die rolls of Tables B-1, B-2 and O-3.

MECHANICAL FAILURE

While the B-17 was a reliable aircraft, the English (or Mediterranean) weather often had a frustrating effect on the engines, turbo-chargers, and other systems of the aircraft. Upon reaching Zone 2, and every turn there-after, roll two dice; a roll of "12" means a mechanical failure has occurred in your plane. Should such a failure occur, roll two dice and consult the table below, implementing the effects given:

2=Engine Failure. Roll two dice to determine which engine:

"2", "3" or "7"—engine #1
"4", "10" or "11"—engine #2
"5", "6" or "12"—engine #3
"8" or "9"—engine #4

Then roll one die: "1-3"=engine restarts; "4-5"=engine restarts but not at full power (may stay in formation only by jettisoning bomb load); "6"=no restart, must jettison bomb load and abort mission. If the engine restarts, but not at full power, the pilot may choose to abort the mission.

3=Turbo-Supercharger Failure. Roll two dice to determine engine as above. Aircraft cannot fly as far or as high, and must drop out of forma-tion. Pilot may choose to abort the mission.

4=Heating System Failure. Heat fails throughout aircraft. May drop out of formation, or must risk frostbite. Pilot may choose to abort the mission.

5=Fuel Transfer System Failure. The crew is unable to transfer fuel from one tank to another, or to engines. Roll one die to determine remaining fuel available: "1-2"=four turns; "3-4"=three turns; "5-6"=two turns. Pilot may abort mission. Upon exhaustion of remaining fuel, the plane must either be landed (Table G-9 or G-10), or crew bailed out.

6=Oil Tank Failure. Roll two dice to determine engine as above. Air-craft must drop out of formation, and pilot may choose to abort the mission. Roll one die: "1-3"=fire, roll to extinguish; "4-6"=leak, engine feathered and plane's speed reduced to two turns per zone.

7=Intercom Failure. Bomb run automatically off-target; gunners may hit on Table M-1 only with a "6" (tail gunner with "5-6"). Pilot may choose to abort mission.

8=Oxygen System Failure. Plane must drop out of formation and pilot must abort the mission.

9=Electrical System Failure. Crew must bail out and abandon aircraft.

10=Top Turret Power Failure. Top turret gunner cannot traverse or elevate guns. Gunner may manually traverse and elevate guns (successful on a die roll of "1-2"). If manual attempt successful, the gunner hits on Table M-1 with a die roll of "6".

10=Ball Turret Power Failure. Ball turret gunner cannot traverse or raise/lower turret. Gunner may manually traverse and raise/lower turret (successful on a die roll of "1"). If manual attempt successful, the gunner hits on Table M-1 with a die roll of "6". If unable to raise turret, a "−1" modifier is applied to landing roll on Table G-9 or G-10; gunner is trapped inside. Pilot may choose to abort mission.

12=Bomb Release Mechanism Failure. Bombs fail to drop during bomb run. Bombadier may manually release bombs (successful on a die roll of "1-2"). If manual attempt successful, bomb run off-target. If unsuccess-ful in manual attempt, plane must leave formation and attempt to jettison (successful on die roll of "1-2"); may attempt one per zone. If bombs onboard upon reaching England, apply a "−4" to the landing roll on G-9 and pilot must remain aboard for landing attempt (remainder of crew may abandon craft). If bombs still aboard in ditching attempt, apply a "−4" to landing roll on G-10 but entire crew may bail out.

Figure 3: Three views of the April 1943 formation.