

FLYING SIMULATORS

NEWSLETTER OF THE AF/D SOCIETY

VOLUME 2 NUMBER 2, 3 & 4

No, I'm not dead and neither is Flying Simulators. Just wounded. I'll tell you a little of the tale of woe. When I picked up the last issue of FS from the printer, the price had doubled from the last time! Obviously, protest did no good. At that point I began searching for another printer. I found one and decided to do a double issue. I carried it over to him and he printed it. When I went to pick it up he had folded, collated and stapled it (I had told him not to) and that added \$~~ to the price. I left it with him. I finally found out that the people that I use for photocopying also did quick printing and photo-reduction. So here it is. The first triple issue in digest size. Let me know how you like it. This is the most economical method of printing and I hope it's legible.

Len Mumbower's column continues, Roger Pittiglio returns after his absence, Norm Albrecht has another article and there are some more surprises.

Sorry for the delay of this issue. Enjoy it!!

NEW RULE. Norman Albrecht Dauntless Basic Rule V1-B4 (p.7). change to:

A plane in dive speed may apply power factors for speed that is lost from maneuvers. The plane may only apply as many power factors to bring him up to maximum level speed without diving. If he drops in altitude, he may attain dive speed if he loses enough altitude to gain at least one speed factor. To increase dive speed, follow regular rules for increasing speed when at dive speed.

PART IV (Continued)

Hangar Talk

Len Mumbower

Therefore, for dive bombing, I strongly recommend (he following rules and procedure for a much more realistic tactic to be used only by aircraft identified as dive bombers in the AF/D rules (Figure 15):

- 1) Enter target area in Echelon formation stepped down in a direction (t.e., right or left) opposite to the direction of the target. Altitude should be a minimum of 9 to 10,000 feet; maneuver or level speed and in L, LB or RB attitude (latter two recommended).
- 2) Use Echelon peel off procedure rules as previously presented and change heading 60 or 120 degrees; enter the log notation DIVE; proceed to maximum dive rate while moving an additional 2 hexes toward the target and dropping altitude 3,000 feet.

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- 3) Each turn thereafter with the continued log notation of DIVE the aircraft will move forward 2 hexes and drop 3,000 feet. Apply maximum dive rate speed and brake factors as shown on your data cards (at the end of the dive you will be well into the dive speed range.)
- 4) During the dive you may optionally make one 60 degree change in heading and/or adjust your dive angle one time to travel 1 additional hex (3 instead of 2) (going to a more shallow dive) for each turn of the dive after the first. There is no cost for these 2 maneuvers. The reasons for this rule are to simulate reality wherein the dive bombers would change headings to confuse flak gunners as well as to adjust heading and dive angle particularly when going after moving targets. It also tends to adjust the dives to the arbitrary hex pattern when actually all points of the compass were available to the pilot.
- 5) Anytime after 2 turns have elapsed including peel off you may drop your bomb and pullout. If you start at about 10,000 feet and do the dive for three turns you will be at 1000 feet, level bank, and at one of your planes dive speeds. You will have moved between 6 and 8 hexes and changed heading an additional 60 degrees between 0 and 2 times since the initial peel off and heading change of 60 or 120 degrees.
- 6) The pilots needed at least 20 seconds and preferably 30 seconds to line up on their targets and attain a high enough speed so that their bomb was more likely to hit the target. Therefore, the minimum start altitude will be 7 to 8,000 feet in which case 2 movement turns would be used until bomb release at 1000 feet. You may if you wish begin your run at higher altitudes than 10,000 feet, but for every 3000 foot increment add 1 movement turn and 2 hex progress toward the target to your dive. Maximum start altitude should be 16,000 feet for a dive to 1000 feet (50 seconds) to avoid excessive speed buildup. You may also release your bomb at higher altitudes, but a dive of at least 20 seconds (2 turns) is required and maximum release altitude is 8000 feet.
- 7) Following pullout you should climb out, bank and turn so as to execute a join up with your squadron using regular AF/D rules as modified by the join up procedure/rules previously presented (Figure 16).

For glide bombing, we discussed how the attack was made at a shallower angle, was commenced at a lower altitude and had bomb release at a much lower altitude. Here again the regular AF/D rules are inadequate. Therefore for any aircraft performing glide bombing (fighter/bomber, dive bomber or any single or twin engine aircraft capable of carrying a bomb load) the following rules and maneuvers are recommended (Figures 12 and 17):

- 1) Enter target area in Echelon formation in the same speed and bank altitude all for dive bombing. Altitude must be a minimum of 2,000 feet, but between 3,000 and 5,000 feet is recommended. You may be higher if you desire, but maximum bomb release altitude is 3,000 feet. At least 2 turns must be used including the peel off turn to perform glide bombing.
- 2) Use Echelon peel off procedure as previously presented and change heading 60 or 120 degrees. Also proceed to maximum dive rate while moving an additional number of hexes

along with loss of altitude consistent with the angle of attack shown in the following table. Also enter the log notation of GLIDE and angle selected (e.g., GLIDE-45).

CHANGES FOR GLIDE BOMB IN ONE TURN

ANGLE OF ATTACK (Degrees)	ALTITUDE LOSS (Feet) (feet)	NUMBER OF HEXES MOVED
30	1000	4
45	1500	3
50	2000	4

note: See Figure 12

- 3) Each turn thereafter with the continued notation of GLIDE. the aircraft will move forward J or 4 hexes and drop 1000 to 2000 feet per turn. Apply maximum dive rate and brake factors as shown on your data card.
- 4) During the dive you may optionally make one 60 degree change in heading and/or adjust your glide angle to travel two extra hexes or one less hex for each turn after the first. There is no-cost for these two maneuvers. This rule is for the same reason as a similar rule for dive bombing.
- 5) Anytime after 2 turns have elapsed, including peel off. you may drop your weapon and pullout. If starting at 5,000 feet with a 45 degree glide angle with a planned bomb release altitude of 500 feet you will have dropped 4500 feet and moved between 7 and 13 hexes and changed heading an additional 60 degrees between 0 and 2 times over the course of 3 turns. You will be at level bank in the dive speed range.
- 6) Following bomb release and pullout you should proceed to join up with your squadron the same as in the dive bombing procedure.

I suggest that you now try these new rules and procedures along with the formation rules in your games and let me know your reaction, comments, and suggested changes. Next time, we'll cover low level tactics such as strafing, rocket attacks and dropping napalm to be followed by fighter section, bomber escort, combat and CAP tactics.

Note: Figures are on pages 5 and 6

REVIEW: **ACE OF ACES**
 Gameshop Inc. 46 Dougherty St Manchester, CT 06040
 Designed by Alfred Leonardi and Douglas Kaufman

This is an unusual but highly enjoyable WW1 dogfight game. Each player holds in his hand a book. Each page shows him the view from his cockpit, and along the bottom are listed possible maneuvers and a corresponding page number. Each player selects a maneuver and announces the page number to his opponent, who turns to that page in his book. Each player then looks for the page number on the new page corresponding to the maneuver he just used. Both players turn to that page number, which should be the same for each player. There, each sees his new cockpit view. It is quite a jolt to find that your view of the enemy is the front of his plane, guns blazing!

The basic version of the game has little beyond what I have just described, and is extremely simple to learn. After purchasing the game, five minutes sufficed for myself and an opponent to “be flying”, and another fifteen for me to shoot him down. The Intermediate game gets a lot more complicated. Introducing speed and altitude changes due to maneuvers, damage to specific parts of aircraft, ammunition consumption, critical hits, etc. The Advanced game is even more complex, and rules for campaign play are thrown in for good measure. In short, the game can be played at just about any level or complication desired. While unsuitable for postal play, the basic version at least is perfect for play via telephone.

The booklets initially offered in the game are “The Handy Rotary Series”, i.e., rotary engined jobbies like the Sopwith Camel and Fokker tripes. Additional booklet pairs to come will include other aircraft types, as well as ground attack and balloon busting. I urge you to all buy this game, if for no other reason than to give its producers the financial means to publish the rest of their series.

Steve List I understand that have released a new pair of booklets with two other a/c. Has anyone seen them? Let us hear how they are. By the way, it’s OK to review other air games and to advertise for players in other air games. World Wide Wargamers Aces High is a good ‘un too. They have expanded it with Blue Max.

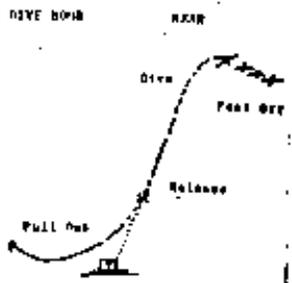
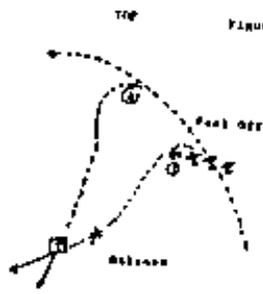
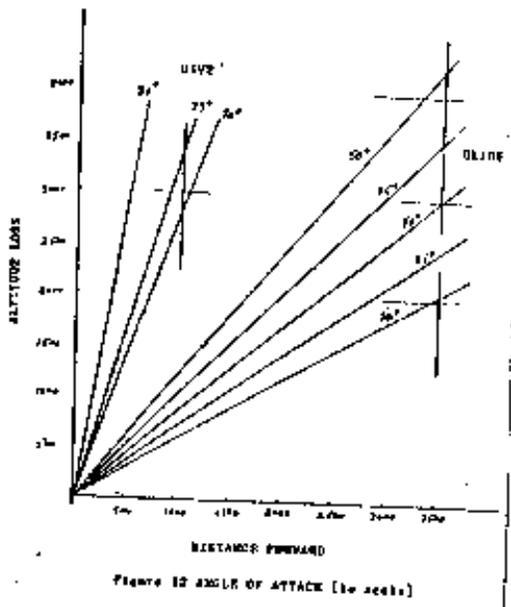
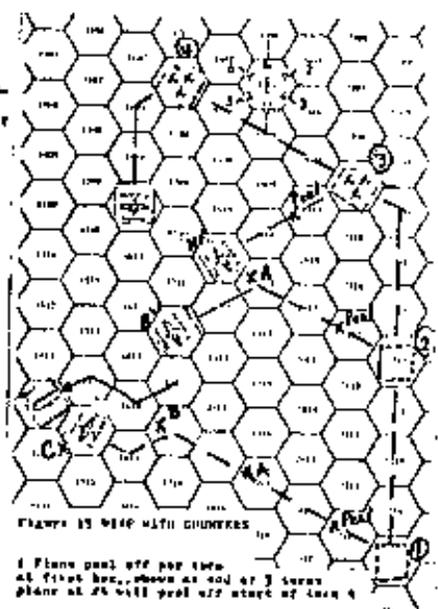
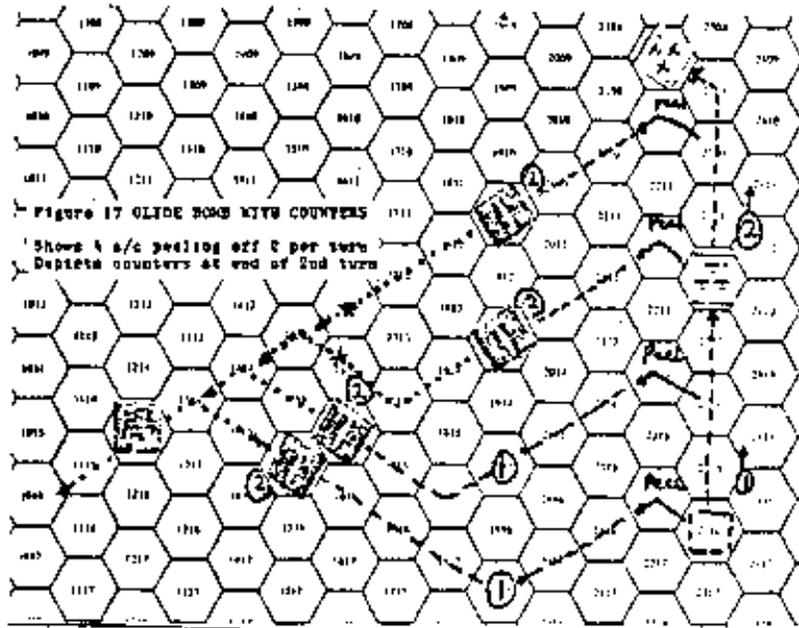
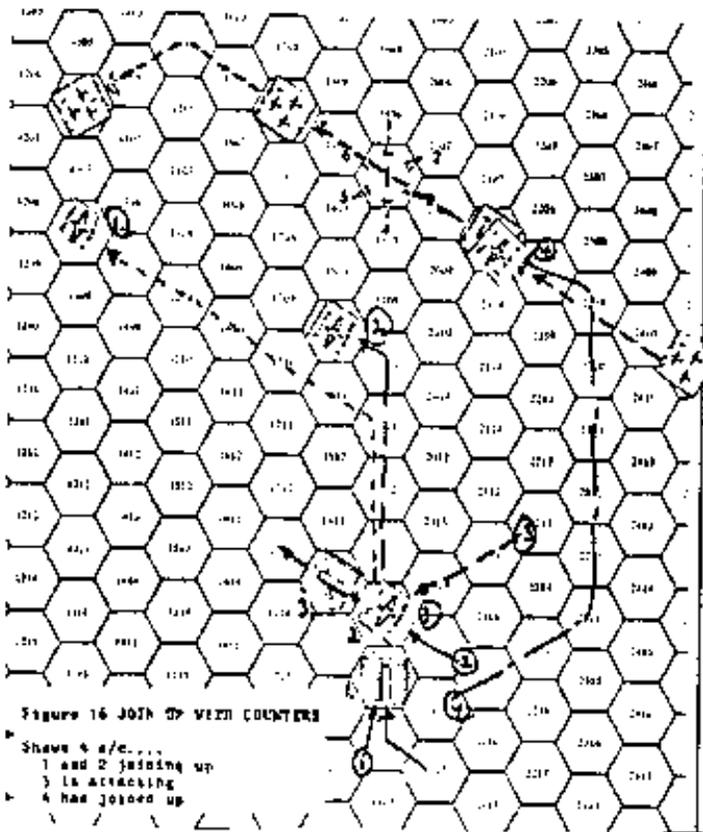


Figure 14 DIVE BOHB





The View From The Cockpit --- Roger Pittiglio

Originally conceived as a biplane, the stubby little Wildcat from the Grumman factory in Bethpage, New York soon became known to the world as the “Sweetheart of the ‘Canal”.

In 1939, the US Navy was in dire need of a front line fighter to go along (and hopefully excel) the pathetic Buffalo. The order was placed with the Grumman factory and in 1940 the first 51 F4F-3's appeared. Many new modifications were incorporated into the new fighting machine such as 4 .50 cal. machine guns in the wings, a sturdy undercarriage. These guns would not have to fire through the propeller. This particular model could attain a speed of 330 mph with a service ceiling of approximately 37,000 ft. Yet it still wasn't all that the Navy wanted.

Grumman engineers went back to the drawing board and came up with the F4F-3A. The main difference in the two marks was primarily in the engine location but with better performance at 16,000 feet. The F4F-4 came next with its folding wings and this is the plane that worked its way into the hearts of many of the pilots. The Wildcat went on in the war to roll up a kill ratio of 6.9 enemy planes for every 'Cat lost. Not a bad set of numbers considering that this plane was sorely inferior to many of the enemy's aircraft.

The following is a chart of some of the different variants of the F4B.

XF4P-1	1937	Biplane configuration. Pratt & Whitney R-1535-92, top speed 264 mph
XF4F-2	1938	Single wing mounted on fuselage centerline, retractable landing gear. changed windshield framing. cowling changes. Pratt & Whitney R-1830-66 Twin Wasp w/ single stage supercharger.
XF4F-3	1939	First model known as Wildcat. Enlarged fuselage, engine change to 2 speed supercharged Twin Wasp, squared off flying surface tips.
F4F-3	1940	Modified production version, 4 wing mounted .50 cal. machine guns. Some sold to British as “Martlets” .
F4F-4	1941	Same as F4F-3 with hydraulically folding wings which were abandoned on production aircraft
F4F-4	1941	Some produced at Eastern Aircraft Division of General Motors as FM-1. Added 2 more 0.50 cal. machine guns to wings, increased ammo supply to 1440 rounds, armour plating for pilot, self sealing fuel tanks. FM-2 was a return to 4 wing guns and six 5 inch rockets

In our games, the only mark of the Wildcat that we have is the F4F-4. Its ability to absorb damage and its armament are comparable to most of the fighters depicted in the game. The climb rate of the F4F is somewhat slow, but the dive rate (due to its weight) is about average.

As for it's maneuverability, the Wildcat is very agile with regards to banks, turns, slips and half rolls up to an altitude of 19.9. After that, the agility drops off drastically. Half loops are cumbersome with the F4F at any altitude.

Tactically, the best way to fight with the Wildcat is on the lower altitudes. At that area, this plane seemingly can hold it's own performing just about any maneuver. However, when trying to shake an opponent or, for that matter, catch up to one, the F4F is seriously outclassed. As with the Brewster Buffalo, one must protect the engine area, one hit in the engine will severely cripple the plane and it's performance since the F4F only has one power factor. Loss of that factor can leave the Wildcat a sitting duck. The best method for attack is a "hit from above and keep on going". This was a tactic used by most of the pilots at Guadalcanal. They would climb well above the enemy, dive, make a firing pass, continue the dive for speed and then climb and start the procedure all over again.

I've had good luck with the Wildcat in most of the games I've played. In Virgil Mugler's demolition Derby, the performance of the Wildcat has definitely been highlighted. I flew one F4F that was hit at least 4 times and probably would have lasted longer except for an inadvertent crash with another plane. Mike Schelhorn has been flying a group of Wildcats that must be nothing but Swiss Cheese, but they are still in the air.

The plane is not the best fighter offered in the game, but with some practice the sturdy F4F can prove to be a very gratifying plane to fly. Those who are interested in reading about this plane, some good sources are.

The Grumman Wildcat Pilot's Handbook--- an excellent resource for modelers like myself.

Joe Foss, Flying Marine

The next plane to be covered will be the F6F Hellcat. If you have any questions, suggestions, or comments about that particular plane, drop me a line. I also want to thank Charles Merrow for his comments on the Buffalo. Unfortunately, they reached me too late to be incorporated into my article.

Roger Pittiglio

Japanese Army Air Force in World War II Jim Frediani

It is often said that you learn more from your mistakes than from your victories. Unfortunately, the Japanese Imperial Army learned a wrong lesson after the Nomonhan Incident. Based on their poor showing vs the USSR Air Force, they based their a/c requirements on Russia being their primary enemy. They were designed for short, overland, tactical missions. They were designed to perform well in cold weather. Subsequently, they were NOT suited to the task they were assigned to in the Pacific War.

The Imperial Air Force was organized into Sentais consisting of three Chutais of 9-12 ~c. A Sentai is equivalent to a Group and a Chutai to a Squadron. There would also be a HQ Section. Next up is the Hikodan (Wing) with a HQ Section, a recon unit (Chutai to Sentai in size) and 3 Sentais. The Sentai could be Sentoki (fighter), Keibaku (light bomber), or Jubaku (heavy bomber). Often one of each, Two to three Hikodans would form a Hikoshidan (Air Division) and two to three Hikoshidan would form a Kokugun (Air Army). Often, smaller independent formations would be formed to meet a specific tactical situation. These would be indicated by the word Dokuritsu.

When the Pacific War broke out, the Service had some 1500 a/c. Seven hundred of these were assigned to Pacific (Malaya and Philippines) operations. Malaya was hit by the 3rd Air Division consisting of mostly Ki-27 fighters (don't ask) and some Ki-43's, Ki-30, 48 and 51 light bombers and Ki-21 heavy bombers. Ki-15 and Ki-46 recon a/c were also available. The 5th Air Division had Ki-27 fighters only, the same bombers as above, and additionally some Ki-36 close cooperation a/c, and Ki-57 transports.

With this conglomeration of a/c, they did rather well, especially where unopposed. The RAP and AVG did rather well against them over Burma. Starting in the Fall of 1942, the Allies were introducing more a/c with better capabilities while the JAAF virtually stood still. Although the fighters were able to fare somewhat on par until October, 1944, the bombers were becoming more and more useless. Their light loads, poor defensive armament, and lesser protection made them "duck soup". Only the Ki-46 and perhaps the Tony: (Ki-61) were capable of equalling their opposite Allied a/c. The third and final phase saw modern equipment out-numbered and out piloted by Allies.

When Allied air attacks on Japan began, they discovered" how short it was of high altitude a/c (read; None). And even when the Ki-43, 44, 61, 84 and 100s did get within striking range, their armament was (prior to late modifications) insufficient to blunt the B-29 operations. If this wasn't enough, imagine Japan's plight when the B-29s started making night raids. The Ki-45 KAI, the only a/c immediately available, had no AI radar, and thus was only marginally effective. They could have used some "Wild Boar" tactics from the Germans, if they could have gotten that information. To further hinder interceptor operations, the Japanese Army restricted sorties to conserve fuel for massive strikes and taiatari raids against the expected invasion fleet.

The JAAF also had three active carriers. They were the Akitsa Maru (30 a/c), Nigitsu Maru (30 a/c) and the Shinshu Maru (20 a/c). They also carried landing craft and were designated as escort carriers. Three others were either incomplete or sunk prior to seeing action. All three active CVE's were in action by 1942.

Also of interest were the guided missiles under development at the war's end. Igo-1-A was an Air-to Surface missile, of partial wood construction. A 1764# warhead was installed, and it was radio controlled. First tested off of a Ki-67 in the Fall of 1944, it never reached operational utilization. Igo-1-B was a smaller version (661# warhead) of the same rocket. It was tested from a Ki-48II light bomber, but it was intended for use by the Ki-102b. Radio controlled, none of the 180 produced missiles were ever used operationally.

WHAT IF' ???? By Bob Best & John Ratzenberger

Sunday, 7 Dec 1941 dawns cool and cloudy. Fog hangs over San Francisco Bay and the airfields in the area are socked in. Various patrol aircraft are routinely dispatched and the Army/Navy/USMC begin another weekend duty day. At 1055 hours the routine quiet of the comm center is shattered by "... Air raid Pearl Harbor ...This is no drill...". By 1130, as many aircraft as can be manned are airborne over the west coast. Meanwhile, frantic duty officers are calling and trying to locate those personnel still out on leave or pass.

Meanwhile, about 250 miles west of San Francisco, a Japanese carrier force exits from under some low clouds, turns into the wind and begins launching a strike force. The attack, originally timed to coincide with the one on Pearl Harbor is about an hour and a half late due to weather delays. Even though the US defenses will be alerted, it is considered imperative that the strike proceed.

At 1245, most of the US fighters scrambled earlier are running low on fuel and are returning to their bases. Confusion is rampant, many units still have not come up to strength, and conflicting and confusing orders are creating more problems. Suddenly, observation posts report a large formation of unidentified aircraft passing over the Coast and entering the bay area. US fighters scramble to take off, while ships in the harbor try to make steam and begin maneuvering.....

The USS Saratoga has left San Diego earlier to ferry aircraft to Midway. A Navy PBY spotted a convoy of ships under some clouds but reported them as friendly. At 1300, the PBY reports that it was fired on by ships and a/c, but never gives a position report. Simultaneously, a transmission about the attack on San Francisco is received. The Sara goes to battle stations and begins launching aircraft toward the estimated position of the enemy force.

On board the Japanese flagship, initial reports indicate the strike is proceeding fairly well, but losses are higher than expected. The strike commander feels that a second strike will finish the job as the majority of the defending fighters will be ineffective due to low ammo and fuel. The Japanese commander decides to launch the second strike when a scout plane reports a large force of USN aircraft approaching from the southeast. The CAP moves to intercept, and the Japanese commander continues the launch to clear his decks of bomb and fuel laden aircraft. The fighters due to escort the second strike climb for altitude.....

A bit fanciful? Yes, but a whale of a game. By bending history a little, John and I were able to come up with a historically plausible scenario that has more than enough action for both of us. As I live in the San Francisco Bay area, I was able to do some research on the locations of airstrips and Army / Navy facilities of the period. From various maps, etc was able to come up with various roads, rail lines, docks, refineries and what not. All this information was scaled to the game and hand drawn on the equivalent of sixteen AF/D/X game boards.

Meanwhile, John researched the forces for both sides. For the Japanese, we decided on a 3 carrier strike force, thus having about 54 A6M2, 54 Val and 54 Kate. The Saratoga, with fighters for Midway had VS-3 (22 SBD), VB-3 (21 SBD), VF-3 (10 F4F), VT-3 (12 TBD) and 18 F2A for Midway. The forces in San Francisco had about 23 squadrons of Army/Navy/USMC a/c -

anywhere from fighters to bombers. trainers, observation, etc.

It soon became obvious that this was a bit big for 2 people to handle, so we decided to scale it down. The first thing was to concentrate the main battle over San Francisco to the Mare Island area (plus a couple more boards). Second, we excluded all the San Francisco based aircraft except for the 5 fighter squadrons. Third, we arbitrarily chopped the remaining forces in half. From that point we further reduced the forces by “allocating” a chunk of the Japanese strike force and the US defense to areas of San Francisco Bay that were not in the “game”. Likewise, VS-3 from the Sara was assumed to be off scouting, etc. This left the following forces:

Attack on SF:

Japanese: 7 A6M2, 9 B5N2, 9 D3A1

US: 3 F4F, 3 F2A, 3 P40, 4 P39 (also have 2 PBV and 1 B25)

The Mare Island area has a half dozen old DD's, some subs, tenders, oilers, cargos, etc in it also.

Attack of Japanese Fleet:

Japanese: 1 CV2, 2 CA1, 4 DD1, 13 A6M2, 9 B5N2, 9 D3A1.

US: 4 F4F, 10 F2A, 6 TBD, 10 SBD

The two scenarios are being played simultaneously. A bunch of extra rules, etc were added in - many for historical flavor. Despite the size of the two games, things are moving along quite quickly - it probably took us longer to design the thing than it will to play it!! So far we are thru seven turns - a progress report follows:

IJN vs SF. The Japanese strike force swept in but was engaged quickly by the defending fighters. Initial losses were heavy as the Japanese aircraft proven to be vulnerable to the heavy guns of the US fighters. However, a portion of the Japanese force has peeled off and caused heavy damage to the Phillips refinery and the rest of the force is headed for the Navy Yard now. The US defenders are running low on ammo and interference from the Japanese escort fighters has finally caused the US fighters to be out of effective position. At this point, the issue is in doubt.

US vs IJN fleet: The Japanese CAP was effectively wiped out in its initial pass at the US force. Japanese launch operations are proceeding as the US force moves inexorably onward. However, the TBDs are providing a preview of Torpedo-8 at Midway and the US will have to rely on its dive bombers, which are coming under heavy flak attack. Again, the issue is still in doubt.

All told, a Jot of fun so far. In many respects, the actual research is as much fun as the game as both John and I like to keep things fairly historical. This is the fifth or sixth such game we have devised between us and so far the largest. One thing that has helped in the play is making up pre-printed OOB sheets for our moves and combat. We use the standard pbm procedures for the the game and arrange things such that one guy does the combat for one game and the other guy for the other - this balances the workload. Likewise, we have found it helpful to use the “Mass Formation” damage forms from the bottom of a log sheet - these are filled out for all a/c in the game and passed back and forth with each move.

Some of you may recognize this as one of the games John listed as a possible for his multi-game.

Flying Tigers won out in the voting, but maybe this can be resurrected for another game. With enough players, we could play out the whole thing.....

AIR FORCE / DAUNTLESS

John Ratzenberger - Imperial Japanese Navy

Bob Best - U.S. Army Air Corps

AIR ATTACK ON NAVAL SHIPYARD FACILITIES IN SAN FRANCISCO BAY AREA.

On the morning, of 7 Dec 1941, naval air units of the Japanese fleet attacked military installations in the Hawaiian Islands. The objective of the attack was to break the back of the U.S. Pacific Fleet and thus keep the U.S. out of the war until the Japanese empire could be consolidated. The IJN stretched themselves to the limit to make the Pearl Harbor attack and were unable to follow through with an attack on the U.S. West Coast as many Americans feared.

Taking the above historical facts, John and I altered history slightly to produce our current AF/D monster game. We assumed that the Japanese were able to provide additional naval units through increased building program during the 1920's and 1930's, And by economizing on naval units in other areas during Dec 1941. We also assumed that since Japans desire was to cripple Americas response to a war crisis in the Pacific, an additional strike at American ship building facilities would clearly delay any response to a war in the Pacific.

Keeping the above hypothesis in mind and since I live in the San Francisco Bay area, I researched naval facilities located in this area. I found that Moffet Field NAS was located in the south bay. Alameda NAS, Oakland Army Base, Hunters point Naval Shipyard, Treasure Island Naval Base and Presidio, San Francisco are located in the central bay area. Mare Island Shipyard and Hamilton AAF Base are located in the north bay area. Mare Island built and the Japanese seeing the effectiveness of German subs in the Atlantic, decided this base must be destroyed.

Mare Island was selected as our major target. Mare Island is located at the mouth of the Sacramento river, across the river from the Standard Oil Refinery and dock facilities and on western edge of the town Vallejo. AF/D map board sections were photocopied and the facility at Mare Island along with the refinery and the town of Vallejo were hand drawn on them.

Terrain was added, along with rail lines, roads and the small town of Hercules outside the Standard Oil refinery. A second AF/D map was placed to the east of Mare Island. On the number 6 section of this map board is drawn a small satellite fighter airstrip. This strip is located outside Concord (about 10 miles east of Vallejo) and parts of it are still in existence today. Two more AF/D map boards are placed below Mare Island and below the fighter strip map. This produces a large square with four AF/D map boards. Two trains, several vehicles, along with many naval ships are placed on the map. The defending American force consists of 3 F2A Buffalo fighters, 3 F4F Wildcat fighters, and 3 P-40 fighters airborne over the four board playing area. Additionally, 4 P-39 Aircobras are on the ground at the fighter strip outside Concord. 2 PBV Catalinas are on the ramp at Mare Island and a B-25 bomber is returning, from coastal patrol. John researched a plausible IJN strike force consisting of air Group from three carriers. John allocated units to strike targets throughout the Bay area and provide CAP for his carriers. The force sent to strike

Mare Island consisted of 7 A6M2 Zero fighters, 9 D3A1 Val dive bombers and 9 D3A1 Kate torpedo bombers.

The Battle

Sunday, 7 Dec dawns cool and cloudy. fog hangs over the Bay and Hamilton Field is socked in. B-25s are routinely dispatched on coastal patrols and the Army is beginning another weekend duty day. At 1055 hrs the routine quiet of the comm center is shattered by "... Air raid Pearl Harbor ... This is no drill ...". By 1130 hrs, units are airborne over the west coast.

Meanwhile, about 250 miles east of San Francisco, the Japanese begin launching their strike force. The attack is about 1.5 hrs late due to delays from a winter storm. After much debate it has been decided to launch the strike even though the US defenses are prepared. The ship building facilities must be destroyed at all costs.

At 1245 hrs, while US air units are recovering at their airfields, coast watchers report a large formation of aircraft passing over the coast. Word is flashed to US planes and 6 Navy and 3 Army fighters move to intercept the unidentified formation.

HANGER TALK.....

Len Mumbower

PART V.

LOW LEVEL TACTICS

Aircraft were used in WWII in quite a few combat roles where the altitude of the plane at the time of firing his guns or delivering his weapon was below 1000 feet. Actually he was normally 'down on the deck' flying at treetop level and well below 500 feet. Normally this was performed by single or twin engine aircraft, but at times the three or four engine planes would be given these types of assignments (e.g. Lancaster ... dam buster; HE 177 ... ground support).

Actually, the designers of AF/D recognized this role of the aircraft since a large number of optional rules were designed to accommodate these tactics (e.g. A/G rockets, torpedo launch, skip bombing, strafing, vehicles, terrain depth charges, etc.) Jim McAmis has introduced another one called 'train busting' which is very good. In this article I would like to discuss these tactics to some extent and to suggest a few rule modifications (e.g., vehicle spotting) for low level missions and to add a few more (e.g. parachute bombs and napalm).

For low level missions there was a greater variety of tactics practiced depending on a particular country's air doctrine and the type of mission. They ranged from highly coordinated attacks by whole squadrons such as carrier launched aircraft torpedo strikes to individual aircraft or small groups of planes such as in train busting and supply vehicle strafing, both of which fell under the category of interdiction. In this latter type mission, although general guidelines were developed, the pilot was more on his own. Since there was such a great variety of tactics employed and types of missions and aircraft, I will only attempt to outline some of them based on either personal experience or knowledge. This is one area where your own personal knowledge and reading can be put to good use in devising how best to simulate a particular situation.

Actually, most pilots enjoyed this type of mission especially if they had air superiority or the target wasn't going to shoot back at them too much. I know that I and my fellow pilots enjoyed our strafing practice in advanced training. There are probably two reasons for this. One was the great amount of flying skill required to fly at 'tree top' level at very high speed (200-350 knots). The second certainly the thrill to be conscious of that very high speed close to the ground flying on your own where you could 'see' ground objects the same as if driving in a high speed racing car. All pilots at sometime in their flying career engaged in 'flat hatting' (showing off) by flying low over countryside, towns, or under bridges, particularly if your friends were watching from the ground. Of course, this type of flying in wartime was a serious business, but many pilots referred to it as 'legalized flat hatting.' Anyhow, back to the tactics and AF/D game.

I will discuss Some of the variety of low level missions along with comments on the AF/D rules and suggested modifications, where applicable, under five categories. They are:

* *

- * Ship Strikes
- * Ground Support
- * Interdiction
- * Target Strikes
- * Miscellaneous

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Ship Strikes - This type of low level mission was usually flown by the Navy as a highly coordinated attack by a full squadron to launch torpedoes at one or two ships. There were also a number of multi engine aircraft used to make torpedo attacks (e.g. HE-111, PB4Y, Beaufort, Peggy) where one or more of them would attack shipping and sometimes warships with their torpedoes. There was also the USAAF which developed the skip bomb technique for attacking ships.

The AF/D rules for both torpedo and skip bomb attacks are realistic as is their suggested 'anvil' tactic of launching from several angles in the 10, 12, and 2 o'clock sectors of the ship so that despite his evasive tactics some torpedoes would strike. Similarly realistic is the required torpedo launch altitude of 100 feet for the allies and 300 feet for Japanese, Germans, and Italians. This realistically simulates the fact that our torpedoes would tend to malfunction if dropped from higher altitudes and the superior design of torpedoes of the Axis powers.

My training and experience did not include any actual torpedo attack practice flights. By late in the war not much Japanese shipping remained and the need was for fighter and dive bomber pilots to combat the kamikazes and support the upcoming invasion of Japan. My recollection from our ground training was that for Navy squadrons the aircraft started their attack from the Echelon formation stepped away from the ship and at about 2000-3000 feet altitude. The leader flew the squadron to a start position and into a banked turn which would scribe a large arc around the front of the enemy ship so as the planes peeled off they would make their runs (which were the equivalent of the shallow glide bomb angles. 25-30 degrees) diving down to an altitude of 50 to 100 feet from several angles and launching their torpedoes at approximately the same time. The torpedo had to be launched from far enough out so it had a chance to arm itself, but close enough so the hit probability was high considering the ships evasive action. Torpedo aircraft were

subject not only to enemy fighters and flak, but also water spouts placed in their 'straight in' approach paths by the ships larger guns. Life expectancy in a torpedo squadron was not very high!

Ground Support - All nations in WWII used aircraft in direct support of their ground forces particularly to help soften up enemy strong points and fortifications. In fact, the 'blitzkrieg' tactic relied heavily on support from the air. All nations also soon learned that tanks could not exist on the battlefield very long without air superiority to protect them from 'tank hunters' as the war progressed and as planes became more specialized for this role (particularly by the German, Russians and British). A plane when armed with cannon, rockets, and napalm was a formidable weapon platform (and still is).

Although small groups of planes would sometimes go on hunting forays looking for targets of opportunity--particularly armored vehicles--this type of support tactic was more organized and coordinated with a ground force action (offensive or defensive). In the Navy and Marines as well as other nations' tactical doctrine I am familiar with two types of approaches were used.

In the first type of ground support tactics a squadron would be assigned to support a given ground unit in a particular sector. A member of the squadron would be temporarily assigned with the ground forces in that sector as a ground controller. Planes from the squadron would be divided into small teams and a schedule established so that one or two teams (2 to 4 aircraft each) would be in the air at all times orbiting a pre designated spot near the action. Fighter cover to protect these aircraft and to intercept enemy aircraft trying to attack our troops also had to be available and in the air.

As the ground forces would encounter strong points of tough resistance or flush out armored vehicles or encounter heavy artillery they would call for air strikes to assist. The procedure would be to inform the ground controller of the coordinates of the position they wanted attacked. The controller would be in voice contact with the circling aircraft and would tell them the location and timing of the requested strike. Friendly troops in the vicinity of the strike would layout color panels or use colored smoke generators to mark their lines to the pilots to try and avoid casualties from friendly fire. The planes would then launch their attacks using their cannons, rockets, bombs or napalm. Starting from about 2000 to 5000 feet, they would use a peel off from echelon and glide bomb approach angle to drop bombs (500') fire rockets (below 400') strafe with machine gun or cannon (50-200') or drop napalm (50-100'). The AF/D rules as modified in previous FS articles adequately cover these types of weapon attacks with two exceptions.

1. Napalm --This weapon was used primarily against troops, tank crews, and gun crews in fortifications. It would wipe out or incapacitate any humans caught in its path and generally set all flammable material on fire. For our rules, if delivered at 100' altitude it will destroy 100% of the humans in the hex it falls in and 50% of them in the next adjacent hex in the direction of flight. I also suggest using the glide bomb chart diagram for under 500' adding +1 to the red die to determine the hex actually landed in.

2. Tanks--These vehicles were very susceptible to damage or destruction when hit from the rear and rear flanks. Rather than the flat 2 F hits required to knock out a tank. I suggest one of the following:
 - a. F hits from the tanks 10, 12 or 2 sector require 3 hits
F hits from the tanks 4 or 8 sector require 2 hits
F hits from the tanks 6 sector require 1 hit
 - b. One hit from the 6 o'clock sector destroys tank
All other sectors require 2 F hits as in rules.

Target Strike --The other type of ground support action would be when aircraft were assigned specific targets to strike as part of a coordinated ground action. These included troop concentrations, vehicle assembly points preparing for an attack, bridges to cut off retreat, supply drops, airfields and their aircraft, etc. Again, strafing with guns and cannons, firing rockets, dropping bombs (dive or glide) or napalm were used as available or dictated by the type of target. Protective air cover also had to be provided these aircraft and the ground troops. Intelligence reports previous to the attacks would have located the general vicinity where the targets might be found.

Again in the AF/D rules, as modified, cover most of these type tactics and weapon employment. The spotting rules, however, are weak in simulating the difficulty of flying to the vicinity of a suspected target and at high speed, in haze and at low altitude find a target (particularly when camouflaged). The following section on Interdiction will establish new spotting rules for ground targets from low level aircraft. In addition, the AF/D rules do not have any provision for parachute bombs which were frequently used. These were specifically designed for low level attacks, particularly by the twin engine medium bombers, to try and provide greater accuracy in a level run across the target area without endangering the aircraft with the blast effects of its own bombs. Therefore, let me suggest the following rules:

1. Parachute Bombs -
 - a. Any medium bomber may carry 10 parachute bombs per mission.
 - b. Delivery is made in level, straight flight from 100-400'.
 - c. One bomb run is made and a string of all bombs is dropped, 2 to a hex for 5 straight hexes from and including the initial hex.
 - d. Bombs fall 100' per turn and drift, due to varying surface winds to the side. Roll 1 die for each bomb and consult the scatter diagram printed on the board for direction of movement for that turn.
 - e. Alternatively, you may establish a prevailing wind and speed per the expansion rules for smoke generators to control the direction of movement at the 200, 300, and 400' altitudes if dropped from that high. Winds at 100' are unpredictable and must be handled as in d. above.
 - f. When they reach the ground roll the die once for each bomb. A 6 means the bomb was a dud and did not explode.

- g. Any target in the hex where it lands is destroyed or damaged per the regular rules for ships, vehicles, buildings, etc. for bomb hits.

Interdiction --This type of mission was probably the most 'free wheeling' of the low level tactics. Here groups of planes flying in small teams (2 to 4) would be assigned 'targets of opportunity' in a sector and be sent out to do what damage they could. This type tactic was used primarily in going after the enemy's supply vehicles --trains, trucks, barges and small ships. The motto seemed to be "if it moves, shoot at it!" This was also one of the more dangerous of the missions for the pilots and one of the most demanding of his flying, visual and other skills. Reasons for this include:

1. He was flying at high speed at low altitude with its inherent call on his flying skills.
2. He had to look for and find his own targets. This meant looking at the ground, yet watching out for ground obstructions (natural and manmade) ahead of his aircraft.
3. He had to keep track of where he was so he could find his way back.
4. He often had difficulty spotting some targets due to haze, smoke, low clouds, camouflage, trees or due to their small size.
5. When he did find a target he had to react quickly because of his relatively high speed and to get in position to fire as well as avoid defensive fire if possible.
6. When he hit a target he generally was very low and close to the target so if the target exploded (as it many times did) he had to react very quickly so the blast and debris did not damage or destroy his own aircraft.

Since the type of targets he was looking for were transportation vehicles he would 'follow' the railroad, road, canal, or river. He would normally fly at an altitude of about 1000' altitude following the route. Then when he spotted a target he would usually maneuver off to the side and drop down to 100-200' to fire at his target from usually the 4 or 8 o'clock position of the target. This angle of attack was used so that in case he hit ammunition supplies he would be traversing over the target more quickly and could also turn and pull up to try and avoid the blast and debris. To better simulate the interdiction mission, I suggest the following rule modifications:

1. Spotting--The aircraft will generally fly at 800' to 1000' above or along the side of the route searching for targets. To simulate his low altitude and high speed over the ground and watching out for obstacles while looking for small targets, the following spotting table is presented:

TARGET TYPE	CLOCK POSITION FROM AIRCRAFT		
	12	10, 2	4, 6, 8
a. on a clear day			
Train	30	20	3
Barge or Ship	30	20	3
Vehicle, moving	12	9	3
Vehicle, stationary	10	7	2
Camouflaged target	8	5	0
Vehicle, off road	7	4	0
b. Haze and low clouds			
Train	15	10	2
Barge or Ship	15	10	2
Vehicle, moving	8	6	2
Vehicle, stationary	6	4	1
Camouflaged target	4	2	0
Vehicle, off road	3	1	0

Note: When the aircraft is at 400' or less, the above values are cut in half (round up)

Trains show up relatively well due to the smoke from the locomotive. Barges or ships have high contrast with the water. Vehicles are much smaller and partially masked by trees. If fired at by flak then in the turn that the flak fires from the ground it can be seen for 15 hexes on a clear day and 10 hexes on a hazy day in the 10, 12 or 2 o'clock sectors and not at all in the 4, 6, and 8 o'clock sectors. The above spotting rules also apply to other ground support missions where the aircraft is sent to the general vicinity and must find the target. Troops and tanks are the same as vehicles for spotting.

2. Aircraft damage due to explosion--If as the result of firing and target hits the target explodes. then you must roll for damage or destruction of your aircraft under the conditions given below. (Conditions for explosion of train loco's or ammo cars are

given below. Use the same approach for trucks and barges and ships or use a roll of 6 to explode.)

When the target explodes the range of blast is the hex occupied plus a radius of 2 hexes (like A/A rockets) to an altitude of 1000'. If an aircraft is in the burst pattern hexes at the the of explosion, it must roll for damage per hit table No.8. If in the next turn the aircraft cannot maneuver to avoid the target hex and it's adjacent hexes (1 hex radius from target) to 500' the plane rolls for damage using hit table No.4. A roll of 1 or 6 will also cause a critical hit to the aircraft.

3. Vehicle Movement -- Movement can be handled via the regular rules treating barges like the slowest ships. These speeds are summarized here in slightly modified form for ships and barges. Note that 1 hex per turn is about 35 mph. Move rate in hex per turn are:

- | | | | |
|----|---|-------------|--------------|
| a. | Trains | 1 | |
| b. | Trucks | 1 on road | 1/2 off road |
| c. | Tanks | 1/2 on road | 1/4 off road |
| d. | Ships in canals | | 1/2 |
| e. | Barges in canals | | 1/4 |
| f. | Ships and barges move downstream in rivers at double their canal speed. | | |
| g. | Ships and barges move upstream in rivers at half their canal speed. | | |

4. Train make up and damage --The idea in going against trains was two-fold. Destroy or seriously damage the engine so the cargo being carried would be at least delayed and the engine. at a minimum need major repairs. The second was to destroy the cargo particularly if it was ammunition or armored vehicles. So in the attack the tactic would call first for shooting at the engine and stopping the train and then to make repeated runs on the cars to destroy any ammo/tanks carried.

In the Jim McAmis train busting scenario. he uses a train larger than real life. (approx. 10 x). Since engine and cars averaged about 40 feet in length it is possible to have 12 cars per hex. A suggested compromise is to use a train of about 4 hexes in length representing a 24 car train (6 cars per hex) plus engine and tender (approx. 2x real life). Using Jim's suggested make up this typical train would, have in addition to the locomotive: 8 supply. 4 flat. 4 troop, 4 ammo. 3 flak and I caboose. The' loco is always in the lead hex while the others are assumed randomly distributed as there is approximately 25% chance of hitting an ammo car in each of the four hexes.

For calculation of damage and chance of explosion use the followings variations of Jim's rules:

- a. Firing at lead hex -- This is considered to be firing at the locomotive. Count E, C, or L hits only. Two C hits stop the train. An E hit gives a 50% chance of an engine explosion. Four hits destroy the locomotive. There is also

a 10% chance of an ammo car in this hex that is hit while firing at the engine that will explode. For each E and C hit roll for this possibility. The ammo car when it explodes will also destroy the 2 adjacent cars and stop the train. After you destroy the locomotive an attack on this hex has a 25% probability of hitting an ammo car.

- b. Firing at the other 3 hexes--For firing at these parts of the train count E and C hits. Every 5 hits in one hex destroys one car and the first stops the train. There is a 25% chance of an ammo car in this hex being hit and exploding for each hit with the same result as in a. above.
- c. Victory points --You get:
 - 1. 10 points for destroying the locomotive.
 - 2. 6 points for blowing up each ammo car.
 - 3. 3 points for stopping the train.
 - 4. 2 points for each car destroyed.

Miscellaneous--To finish off this article. I would like to comment briefly on two additional aspects of low level missions.

- 1. Depth Charge Bombing - The rules in the regular game appear fairly realistic for attacks against submarines. However, nothing is said of the mission tactics. There were many types of missions for ASW. One of these in WWII starting about 1943 was the use of small aircraft carriers by the U. S. assigned to convoy protection against subs. They carried TBF Avengers and some fighters (30 to 40 aircraft). These aircraft flew protective cover for the convoy searching for targets or were sometimes guided to a suspected area by surface craft. They also flew sector searches in sea lanes looking for subs and when found attacking the sub. This was done by flights of 1 or 2 TBFs loaded with depth charges flying at a search altitude of about 1000 to 3000 feet. Blimps and multi-engine aircraft also participated heavily in ASW. Generally from shore bases and patrolling the coastal area. I will plan on doing a separate article on ASW at a later time.
- 2. Barrage balloons - The AF/D rules barely touch on this area. First they only describe one type which was used around cities such as London (balloon at 13,000ft). However, in the rules there is only 1 cable stretching to the ground. Actually, these were put up in pairs with horizontal cables running between each pair of balloons separated by only 200-300ft like a net. These were designed to cause the German medium bombers to bomb from higher than normal altitudes or to force their bomb runs into lanes where flak protection would be heavier.

In addition, balloons were used by the U. S. and British, and, I am told, by Japan for protecting ships against low level attack. These were tethered to the ships and kept at an altitude of 100 to 500 feet to discourage close-in attacks by aircraft using low level delivery tactics.

I suggest that you add these additional cables between high altitude balloon and also the low level balloons to your ships--particularly when they are supporting amphibious operations. Roll for hitting the cables same as in the rules. In addition, if you try and destroy the balloon (C hit) you must try and avoid the balloon as it explodes. burns. and falls per the following rules:

- a. If in an adjacent hex when it explodes a roll of 5 or 6 catches and destroys your plane.
- b. On the following turn if you cannot avoid flying through the hex the balloon occupied (at or below its altitude) before it exploded. then a roll of 6 destroys your plane.

Next column. I plan a change in pace by turning to the Air Intelligence area and discussing flak analysis and some modified flak rules that Jim and I have been working on. After that we'll return with an article on further fighter combat tactics (bomber escort. combat air patrol and section tactics against other fighters.)

Critical Hit Alterations -- Jim Frediani

On multi-engined bombers, anytime a critical hit die roll is required, LOADED multi-engined bombers receive a CRITICAL "F" hit on a roll of -3-. A second die roll is as follows.

- (1) BD - Bombs Detonate. A/C destroyed, no bailout.
- (2) FF - Fuselage Fire. Continuing fire destroys 1F on a die roll of 1-4, a G destroyed on a die roll of 5 and bombs detonate on a die roll of 6
- (3) IS - Intercom System out. Halve (drop fractions) all gunnery factors for the remainder of the game.
- (4) BB - Bomb Bay Doors Jammed. Jam closed on a die roll of 1-3. May not" drop bombs or jettison. Jam open on a die roll of 4-6. May drop bombs, apply 1K factor per turn. May try to manually close or open doors each turn during bail-out phase on a die roll of 1 (Success).
- (5) LS - Electrical System Failure. ~ May drop bombs only on a die roll of -1-. May begin trying as soon as necessary.
- (6) BS - Bomb Sights smashed and bombardier killed. Subtract 1 from the red die.

Fires

C hits for continuing fires isn't realistic in all cases. If the GM or player wishes to go to the

trouble they can use the following rule.

1. FE Continuing Fire - Die roll 1-4 = L, 5 = W, 6 = F
2. CF Continuing Fire - Die roll 1-4 = C, 5 = F, 6 = L
3. EF Continuing Fire - a) single engine - Die roll 1-3 = E, 4 = F, 5-6 = C
b) multi engine - Die roll 1-2 = E, 3-4 = W, 5 = L, 6 = F
when multi engine is destroyed - Die Roll 1-3 = W, 4-5 = L, 6 = F

Combat Alterations:

Reading accounts of some of the aces, I noticed that some of them killed more a/c on a single mission than they were allowed to fire at in AF/D. Therefore, I propose the following rules for ammunition:

- 1) A player may opt to fire his guns at 1/2 attack factor, and only use 1/2 of an ammo point. Obviously this is great for aces, but that's who usually had the best chance of using this. I suggest this only to moderators who wish to be bothered with the extra bookkeeping.
- 2) Aircraft with FH or FL guns have separate ammunition for these guns. Therefore they have the same ammunition allotment as listed for all guns of that type, but must be listed if NOT fired, and separate track is kept of their expenditure. This is especially helpful to some He-219 models with more than the AF/D charts allow.

BS- Bomb Sights Smashed and Bombardier Killed. the red die roll.

Subtract 1 from

Fires C.hits for continuing If the OM or player wishes following rule. 1. FE Continuing Fire2.

CF Continuing FireJ. EF Continuing Fire~

fires isn't realistic in all cases. to go to the trouble, they can use the

die roll--1-4=L, 5=W. 6-F die roll--1-4=C.:5=F.6=L a) single Engine- die roll-b) multi-

engined- die roll-

I-J=E. 4=F.5-6=c 1-2=E. J-4=W. 5=L, 6=F

when engine is destroyed I die roll-- 1-)=W. 4-5=L, 6=F

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RAMBLINGS I There is a fairly new book I just finished reading about the AVG and the Fourteenth Air Force. The title is Ding Hao: America's Air War in China 1917-1945 and it's written by Wanda Cornelius and Thayne Short. It was a recent Military Book Club selection. I would recommend it to anyone with an interest in the AVG or the Pacific Theater in general. Lot's of personal insights and reminisces.