



In nine days during July 1941, air war planners on Hap Arnold's staff put together a bold plan for the defeat of Germany.

The Prescient Planners of AWPD-1

By Phillip S. Meilinger

IN JULY 1941, President Franklin Roosevelt believed it prudent to begin planning for conflict. On July 9, he directed the War Department's General Staff to begin drawing up production requirements for a war that assumed Germany would be the main enemy and Britain the main ally.

The plan he requested was to follow guidelines already established in the Rainbow 5 and ABC plans. The Rainbow plans were so named because they were color-coded—orange for Japan and black for Germany, for example—whereas secretive plans drawn up with the British and Canadians were termed the ABC plans. The outlines of both sets called for a Europe-first strategic framework in the event America joined the war.

Upon receiving this tasking, Col. Clayton L. Bissell, an airman in the War Department General Staff's War Plans Division, immediately went to Gen. Henry H. "Hap" Arnold, the commander of the Army Air Forces.

Bissell was one of the old guard airmen and a strong airpower advocate. He had

been an aide to Billy Mitchell shortly after World War I. Seeing the importance and potential implications of Roosevelt's directive, Bissell suggested to Arnold that he ask to have his own staff draw up the air annex to the war plan. Ordinarily, the Army's Plans Division had this responsibility, but Arnold agreed with Bissell's suggestion and approached Gen. George C. Marshall, Army Chief of Staff, on the matter. The request was granted.

To author it, Arnold turned to Lt. Col. Harold L. George, Lt. Col. Kenneth N. Walker, Maj. Haywood S. Hansell Jr., and Maj. Laurence S. Kuter. All had been instructors in either the Air Force or Bombardment Sections at the Air Corps Tactical School before the war, and all had played key roles in formulating the doctrine of high-altitude, daylight, formation precision bombing of an enemy's industrial centers. Now they were tasked to put their ideas into practice.

More than a dozen other staff officers from various divisions on the Air Staff (Maj. Hoyt S. Vandenberg and Col. Arthur W. Vanaman, among others) and procurement specialists from Wright Field in Ohio assisted on various parts of the plan. These officers drew up what was termed an aircraft production plan, but was actually far more detailed. It would be the air war plan for the defeat of Germany: AWPDP-1, for the Air War Plans Division-Plan 1.

The task was enormous, but the strategists approached it by relying on their own

experiences, academic studies done at Maxwell Field in Alabama, and their belief in the efficacy of strategic bombing—which had yet been put to a serious test.

What Made Germany Tick

The first task for the team was to articulate strategic objectives (derived from the existing ABC and Rainbow 5 plans), defend the Western Hemisphere, defeat Germany and her allies while maintaining a strategic defense in the Pacific, and provide close air support to the ground forces in preparation for an eventual invasion. For airpower, the goal was to destroy the industrial war-making capacity of Germany and restrict Axis air operations.

Following their doctrinal beliefs from the tactical school, the planners studied information on the German economy to determine what made it tick. Once they understood how that economy worked, it would be easier to figure out how to break it. Hansell was recently assigned to the intelligence section of the Air Staff and had been in Britain observing the Royal Air Force bombing campaign against Germany. The British were helpful and shared sensitive information, and the knowledge Hansell gained in those duties proved extremely useful.

In addition, the planners turned to American industrialists and bankers for assistance in understanding the US economy, assuming the operation of modern industrialized societies were similar. The airmen knew that many of Germany's factories were financed or built by American banks and companies. As a result, they were able to obtain detailed blueprints of many German industrial facilities from sources on Wall Street.

The planners then sorted and prioritized this data to project an image of Germany as an industrial web. This notion was to visualize the enemy's economic infrastructure as a huge web, and like a spider's, a disturbance in one sector would reverberate throughout the entire system, as per the theories of strategic bombing. The airmen believed that a modern society was interdependent, which meant that it was not necessary to attack and destroy everything of economic value. Rather, planners should strive to discover which targets were most important to the whole and whose destruction would cause a cascading effect and produce the most damage to the entire system.

Using this construct, an examination revealed the 154 most important targets in Germany. These were grouped into six major target sets: 50 electrical power plants, 47 transportation networks, 27 synthetic oil refineries, 18 aircraft assembly plants, six aluminum plants, and six "sources of magnesium." Using data from bombing tests and the RAF, the planners determined the weight of ordnance needed to destroy a variety of structures. They projected loss rates in aircraft and crews and estimated how many aircraft would be needed, as well as the number of personnel to fly, maintain, and support the force.

Later critics claimed planners were overly mechanistic, treating the campaign as a science problem rather than a Clausewitzian exercise in friction. However, the planners did take unknowns into account. Based on prewar experiments, they determined accuracy estimates and loss rates and then multiplied these peacetime accuracy numbers by 2.25 so as to produce a figure they presumed would account for wartime: poor weather, enemy fire, fear in combat, enemy attempts to camouflage or otherwise hide the targets, and other factors. They also employed an attrition figure of 20 percent per month for all units, derived from a study of RAF operations.

Putting this together, planners came up with a needed force of 6,834 operational bombers organized into 98 groups. The officers assumed an additional 1,708 aircraft would be located in depot reserve, and they projected a monthly replacement rate of 1,245 aircraft.

For defense of air bases in England, they would need 3,400 fighter aircraft. Planners thought there would be a shortage of bases in Britain, and therefore called either for more of them elsewhere, or a bomber with twice the range of the B-17 or B-24. This would, of course, become the B-29, although the Superfortress would never be used in the European theater.

Left: B-24s bomb heavily loaded railroad sidings at Karlsruhe, Germany. Below: A four-ship of P-51 Mustangs. Jimmy Doolittle declared that the first duty of Eighth Air Force fighters was to destroy German fighters.





Henry "Hap" Arnold

Given the planned force, they estimated it would take six months to destroy the 154 targets once a campaign was fully operational. They predicted a token force of three bomb groups would be able to begin operations in April 1942, but a full offensive could not begin until April 1944; hence, the 154 targets would be eliminated by September 1944.

The numbers they arrived at were enormous: more than 63,000 aircraft and some 135,000 pilots as part of a force totaling 2.1 million personnel. Considering that the AAF had ordered only some 300 heavy bombers for 1941, the vision and audacity of these planners were remarkable.

Even so, AWPD-1 underestimated the number of aircraft needed. By the end of the war, the AAF purchased more than 231,000 aircraft, of which nearly 35,000 were strategic bombers. The accuracy and attrition multipliers they used, though sizable, were not large enough. Not factoring in major war with Japan also affected projections.

Planners assumed an invasion of the continent would take place, but if an air offensive were successful, a land invasion might not prove necessary. Planners recognized the AAF's first priority was to gain air superiority over Germany. Without it, a bomber offensive would be long and bloody. As a consequence, they listed the German Luftwaffe and the factories supplying it as a crucial intermediate objective. "The degree of success attained by our sea and ground forces will be determined by the effective and timely employment of air superiority units and the successful conduct of strategical missions, the plan said. "No major military operation in any theater will succeed without air superiority or at least air superiority disputed."

While the air superiority campaign was ongoing, however, the bombers would also be attacking German economic nodes. Escort fighters for the bombers, though such aircraft would be desirable, did not yet exist, so planners recommended urgent development of such an aircraft. In the meantime, they offered the combination of speed and altitude; defensive guns and a tight formation would be adequate to get bombers to their targets and back.

Some views of airpower prior to World War II did not emphasize fighter escort for bombers. The doctrine formulated at the Air Corps Tactical School between the world wars focused on strategic bombardment of industrial objectives. In the early 1930s, the instructors there had already begun to argue that the speed of attacking bombers (such as the B-10) was nearly as fast as the P-26, and the B-17 was even speedier—meaning that interception of a bomber formation was unlikely. They assumed "the bomber will always get through."

The Escort Mission

In the days before radar, this was not an unwarranted assumption. Planners did not update their assumptions once radar did become operational, however.

Not everyone subscribed to supremacy of bombardment. Capt. Claire Lee Chennault, a pursuit instructor at Maxwell from 1931 to 1936, argued just as vehemently that the bomber would not always get through, and that a well organized and capable defense, armed with first-rate interceptor airplanes and backed by a ground-observer corps, would be able to defeat an air attack. In one lecture, he dismissed the overly optimistic thinking of bombardment by saying a "lack of regard for hostile opposition is a theory which has no foundation in experience." Chennault, who would later organize and command the



Harold George

Flying Tigers in China during World War II, was ignored, with devastating results.

Chennault and his successor in the Pursuit Section at the tactical school, Hoyt Vandenberg, did not advocate escorts for the bombers they suggested were at high risk. To them, such a mission was too passive and would inhibit the inherently offensive nature and aggressiveness of fighter pilots.

As a result, the lack of an adequate escort fighter at the beginning of the bomber offensive in Germany was based on both technical and doctrinal shortcomings. Even if such a fighter were available at the time, to many pursuit/fighter pilots of that era, such a defensive mission was out of character and "incompatible with the mission of pursuit," a phrase used by Vandenberg while on the Air Staff in 1941.

Entering the war, official Army doctrine acknowledged the escort mission, but saw it in purely defensive terms. Field Manual 1-15, *Tactics and Techniques of Air Fighting*, stated the role of escort was to ensure the success of the forces they support. "Their firepower may be considered as replacing or augmenting the defensive firepower of the supported force. Their mission precludes their seeking to impose combat on other forces except as necessary to carry out their defensive role," it stated.

The doctrinal issue was settled once and for all in early 1944 when Maj. Gen. Jimmy Doolittle took over command of Eighth Air Force. When walking into the headquarters of his fighter command, he noticed a sign that read: "The First Duty of the Eighth Air Force Fighters Is to Bring the Bombers Back Alive."

He ordered it removed and replaced with one stating: "The First Duty of the Eighth Air Force Fighters Is to Destroy German Fighters."



Laurence Kuter



B-17s from Eighth Air Force fly through flak to drop their bombs on Leipzig, Germany, during a bombing raid on aircraft factories.

The semantic distinction went to the heart of the debate regarding the proper role of fighters in an escort role. To Doolittle, the issue was one of capitalizing on the innate aggressiveness of fighter pilots. By unleashing them to seek out and destroy enemy aircraft whenever and wherever they were located, he ensured that the bombers would indeed be protected. Doolittle later wrote that he thought this decision was his most important and far-reaching of the war.

As the war planners noted, however, the problem was also technological. Few airmen believed it was possible to build a suitable escort fighter incorporating both the range and agility to engage enemy interceptors on equal terms. An aircraft with the range to escort bombers had to be large enough to carry a great deal of fuel and would thus need two engines. To compensate for the lack of maneuverability of such a design, it would need flexible gun positions and extra crew members to man them. Soon, the escort fighter looked

much like the bombers it was designed to protect. Such a multiengine fighter would be at a severe disadvantage when confronting the agile interceptors of the Luftwaffe.

Drop Tanks to the Rescue

There were some aircraft builders who disputed these notions. The P-35, built by Alexander P. de Seversky, was a remarkable airplane when the Air Corps began purchasing it in 1936. Incorporating a revolutionary “wet wing” design, the P-35 was extremely fast and had unusually long range: It could fly from coast to coast with only two refuelings. De Seversky’s ideas, like those of Chennault, were also largely ignored.

Even so, it became apparent during the war that even the P-47 Thunderbolt—the successor to the P-35—did not have the legs to escort bombers all the way to the target. The solution was the drop tank. Cheap, disposable tanks were slung under the wings of fighters such as the P-47, P-38, and P-51, and pilots would drain gas from these tanks first. When empty, they were jettisoned and the airplanes would still be equipped with a full internal fuel load.

The results were dramatic. By the end of the war, P-51s were able to escort the bombers all the way to Frankfurt and back.

The AWPDP-1 planners understood the problem of fighter escort. They saw such an aircraft was necessary to protect bombers, but fell into the mindset of most other airmen at the time that such an airplane was not technically feasible (and were proved wrong).

AWPDP-1 was completed in nine days. It was a Herculean task in miserable heat; the munitions building where they worked was not air-conditioned. Tempers frayed and discussions included numerous heated exchanges between the planners. The plan



Kenneth Walker

was briefed up the chain of command and approved by Secretary of War Henry L. Stimson on Sept. 12, 1941.

The blueprint laid out in AWPDP-1 was a good starting point, though the priority assigned to specific target systems would vary during the war. Though daring in its materiel and personnel projections, planners still underestimated the resources needed. The warning that long-range escort fighters might prove necessary proved all too true.

There were, however, other errors in the planners’ thinking: German industry and morale were tougher and more resilient than expected and bombing accuracy was worse than projected.

Nonetheless, AWPDP-1 remained a reasonably accurate forecast of the US strategic bombing effort against Germany. The planners predicted a token force of three bomb groups could be ready to begin operations in April 1942, while the first B-17 strike actually occurred in August. The planners had also not anticipated the North African invasion that siphoned off bomber assets intended for Eighth Air Force.

However, the planners’ predicted full bomber offensive began in spring 1944, and by the end of that year, the German economy was indeed in shambles. ■

Phillip S. Meilinger is a retired Air Force pilot with 30 years of service and a Ph.D. in military history from the University of Michigan. He is the author of seven books and more than 80 articles on military affairs. His latest book is Hubert R. Harmon: Airman, Officer, and Father of the Air Force Academy. His most recent article for Air Force Magazine, “A Short History of Decisiveness,” appeared in September 2010.



Haywood Hansell Jr.