

Strike Force in the Making

U.S. Naval Carrier-Based Attack Aircraft Developments from 1926 to 1940

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"Naval aviation cannot take the offensive from the shore; it must go to sea on the back of the fleet... The fleet and naval aviation are one and inseparable."—Rear Admiral William A. Moffett, Chief of the Naval Bureau of Aeronautics, 1921–1933.

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One of the U.S. Navy's leading attack airplanes of the late 1930s, the Curtiss-Wright SBC-4 was still in service in December 1941 when the U.S. entered WW II and was the last type of military combat biplane to be manufactured in the U.S.

Photo: Editor's Collection

Background

When the world's first true aircraft carrier, HMS *Furious* of Britain's Royal Navy, made its appearance in 1917, the prevailing view within the British Admiralty was that this new type of ship should operate well behind the screening force where its aircraft would function primarily in a reconnaissance role, and such thinking continued to dominate Royal Navy planning over the next two decades. This policy would have grave consequences in late 1941–early 1942, when, confronted with war on multiple fronts, Britain found herself unable to effectively counter the might of the

Imperial Japanese Navy. Japan, using invasion forces backed by aircraft carriers, swept the British from control of their Far East possessions in a matter of months. By that time, the only way to defeat aircraft carriers was with opposing aircraft carriers.

The American experience, fortunately, was considerably different. When the first aircraft carriers began entering service with the U.S. Navy (i.e., *Langley* in 1922, followed by *Lexington* and *Saratoga* in 1927), Rear Admiral William A. Moffett, the chief of the newly-created Naval Bureau of Aeronautics (BuAer), successfully advocated that the aircraft serving aboard

these carriers be used primarily as aerial weapons to enlarge the fleet's striking power, as opposed to just observation and scouting platforms. At the time, there was much debate going on within the U.S. military establishment as to the role of air power in the nation's future. On one extreme, the Army's Brigadier General Billy Mitchell (see "Barling to B-36," *Skyways*, No. 65, Jan. 2003) insisted, to the point of demotion and court martial, that military aviation be separated from *both* the Army and the Navy. Moffett, in a studied contrast, lobbied very carefully to integrate his fledgling carrier force into an overall fleet strategy then dominated by the Battle Line (i.e., battleship divisions). As a result of Moffett's efforts, plus other men like Captain Joseph M. Reeves (first commanding officer of Aircraft, Battle Fleet) and Admiral Ernest J. King (Chief of BuAer 1933-1939, Chief of Naval Operations 1942-1945), the U.S. Navy by the mid-1930s had become a leading power in the development of a carrier-borne striking force with only one serious rival, the Imperial Japanese Navy. By the eve of World War II, America's Navy numbered a force of seven fleet carriers and had three more under construction, versus Japan's eight with four under construction. After the Japanese attack on December 7, 1941, with most of the Pacific Fleet's Battle Line lying on the bottom of Pearl Harbor, aircraft carriers replaced battleships as the foremost weapon of the U.S. Navy's wartime Battle Groups/Task Forces, and their attack aircraft became the point of the spear.

Attack Aircraft Development in General

In conjunction with the carrier program itself, development of carrier-based attack aircraft during the 1922-1940 period proceeded at a steady, if not rapid, pace. When *Langley* was commissioned in March 1922, the Navy possessed no made-for-purpose carrier aircraft and had yet to develop any practical base of knowledge upon which new aircraft requirements could be issued. Until 1927, the Navy used modified landplanes and floatplanes like Vought VE-7s and Aeromarine 39-Bs to evaluate types of arresting gear, develop procedures for handling aircraft aboard ship, and train the very first group of carrier pilots. Even after *Lexington* and *Saratoga* entered service in late 1927, budgetary constraints obliged the newly-established carrier air groups to make due with a variegated mix of aircraft, many of which were still obsolescent floatplane and landplane designs adapted for carrier use. Moreover, to perform the many tasks needed from their aircraft, the early air groups often operated up to six different types of planes—bombers, fighters, scouts, torpedo planes, observation, and utility. And from a maintenance perspective, the situation was complicated further by the fact that most of the types in use had been constructed by different airframe manufacturers.

One of BuAer's early goals in issuing aircraft requirements was to combine as many functions as possible into fewer airframes. What air groups needed

was more fighters to improve air superiority around the Battle Group and more dedicated attack aircraft to enlarge the fleet's aerial striking power. Toward this end, requirements for new carrier aircraft issued from 1927-1935 underwent an interesting series of permutations—e.g., scouts, bombers, bomber-fighters, two-seat fighters, single-seat fighters, and torpedo planes—until BuAer settled on a pattern for three basic types: (1) single-seat fighters [F] to provide air superiority around the carrier, escort the strike force, and also operate in a fighter-bomber role; (2) two-seat scout bombers [SB], which combined the functions of scouting (highly important in the days before radar) and dive-bombing in one airplane; and (3) three-place torpedo-bombers [TB] capable of either launching torpedoes or making level bombing runs. From that point, a single carrier air group was typically composed of four squadrons of 15-20 aircraft, to-wit: one fighter (VF), two scout-bombers (one VS and one VB), and one torpedo-bomber (VT). This formed the basic pattern used until the middle of World War II.

While BuAer made good progress in establishing functional requirements, it was decidedly slow in taking advantage of certain advances seen in the aeronautical state-of-the-art during the 1930s. Chief among its concerns was the higher landing speeds and unforgiving stall characteristics demonstrated by many of the new all-metal monoplane designs, with the result that biplane types continued to make up most of the fleet's fighter and attack aircraft force right up until the end of the 1930s. BuAer's conservative approach to innovation was no more apparent than in 1934-1935, when it issued requirements for new monoplane and new biplane carrier aircraft at the same time. Although small numbers of monoplane scout and torpedo bomber types (i.e., SB2U-1s and TBD-1s) began reaching the fleet late in 1937, the reequipping process continued slowly and was still in progress as of late 1941. The outbreak of war in Europe in 1939 and increasing friction with Japan proved to be a catalyst for an unprecedented expansion in Naval Aviation; however, the effect was not immediate, so that by December of 1941, the Navy's inventory of attack aircraft stood at only 809 torpedo and scout bombers of all types, which included several squadrons of SBC-4 biplanes.

Torpedo-Planes and Torpedo-Bombers

During the 1920s, the aerial-launched torpedo was considered to be naval aviation's primary anti-ship weapon, and although this view was modified after 1930 to include dive-bombing attacks, the torpedo continued to form an important element of BuAer's offensive strategy. However, even as late as 1942, one of the principal shortcomings of aerial torpedo attack was the extremely narrow release parameters—i.e., (1) an altitude not exceeding 50 feet and (2) an airspeed not exceeding 115 knots (132 mph), and (3) 2,000 yard range. This low, slow, and close approach left the torpedo-bomber attacking force enormously vulnerable (as demonstrated



The Martin T3M-2 gave the Navy the capability to operate torpedo planes from carriers.

Photo: Hal Andrews Collection

by actual combat experience in June 1942) to both anti-aircraft fire from enemy ships and fighter attack from above.

The first torpedo-carrying aircraft to be developed specifically for carrier operations was the Martin T3M-2, a three-place biplane ordered in 1926. Derived from the earlier T3M-1 floatplane/landplane design, it featured a more powerful 710 hp Packard 3A-2500 liquid-cooled engine, more wing area (i.e., upper wing increased in span so that the wings were equal span), redesigned crew arrangement (i.e., pilot, bombardier, and gunner in tandem), plus arresting gear. The Navy procured 100 of the type and it began equipping newly formed VT units in 1927. During the same timeframe, BuAer shifted its procurement policy toward aircraft powered with the newer air-cooled radial engines, which led Martin to rework and test the T3M for installation of the 525 hp Pratt & Whitney R-1690 Hornet. Modified wings, a balanced rudder, and other improvements resulted in the introduction by Martin of the Hornet-

powered T4M-1, which flew in April 1927 and was followed by 102 production models. When Martin sold its Cleveland, Ohio plant to Great Lakes Aircraft in late 1928, the latter undertook production of a further 18 T4M-1s under the new designation TG-1. In 1930, the Navy procured 34 improved TG-2s equipped with the 620 hp Wright R-1820 engine, increasing payload by 350 lbs and raising top speed by 20 mph. For level bombing, all of the torpedo planes of this period were designed to house a bombardier's station located in the belly of the aircraft. It should also be noted that from 1919, the Naval Bureau of Ordnance (BuOrd) fostered development of various types of bombsights, resulting, by 1930, in the introduction of the Mark XV, a fully-synchronous, gyro-stabilized sight designed by Swiss inventor Carl L. Norden (for more detail, see "Illuminati," *Skyways*, No. 69, January 2004).

Attempts from 1930 to 1933 to generate replacements for T4Ms and TGs were unsuccessful. The R-1820-powered Martin XT6M-1 of 1930 and the R-1690-

The Hornet-powered T4M-1 was a further evolution of the T3M. The T4Ms built by Great Lakes were designated TG.

Photo: Editor's Collection



A TG-1, a Great Lakes-built T4M-1, with its underslung torpedo. T4Ms and TGs had a relatively long career in the Navy from 1927 to 1937.

Photo: Editor's Collection



powered Douglas XT3D-1 of 1931 were both biplane designs, which despite more modern construction methods and better general performance, were not considered as offering any significant advantage over existing T4Ms and TGs. Likewise, the improved XT3D-2 of 1933, which featured such refinements as a twin-row 800 hp Pratt & Whitney R-1830 engine, wheel pants, and NACA cowl, was not ordered into production. In consequence, the aging T4Ms and TGs remained in service as the fleet's standard torpedo type until 1937—a relatively long career for early carrier designs—at which point they began to be replaced by monoplanes.

In June 1934 BuAer issued a wholly new requirement under its new torpedo-bomber (TB) specification, and two different prototypes were ordered: the monoplane Douglas XTBD-1 and the biplane Great Lakes XBTG-1. Both aircraft were to be powered by the 800 hp, twin-row Pratt & Whitney R-1830, have retractable landing gear, and carry a crew of three. Each would be equipped with a Norden bombsight for level bombing and be armed with two .30-caliber machine guns—a

fixed forward gun fired by the pilot and a flexible mount for a gunner stationed in the aft part of the canopy enclosure. The XTBD-1 was all-metal with fabric-covered control surfaces, whereas the upper and lower wings of the XBTG-1 were fabric-covered metal structures. The XTBD-1 was completed and delivered for testing in April 1935, and the XBTG-1 followed in August of the same year. Interestingly, flight trials revealed the XTBD-1's performance to be only slightly better than the XBTG-1 (a top speed of 205 mph vs. 185 mph, a ceiling of 20,800 ft vs. 16,400, and range with torpedo 449 miles vs. 558 miles) but its overall flying characteristics and stability were markedly superior. The TBD-1 became the first monoplane ordered for carrier service in February 1935 when the Navy awarded Douglas a contract to build 114 examples.

Production TBD-1s featured a taller canopy, an 850 hp engine, and changes to the cowling. The type began entering operational service in June 1937, and the Navy added 15 more to the original order in 1938. While TBDs were perhaps the most advanced torpedo-bombers in the



The Douglas XTBD-1. The TBD was the first monoplane ordered for carrier service in the Navy.

Photo: USN, Editor's Collection



The Grumman TBF-1 Avenger. The TBF and TBM, the General Motors-built equivalent, became the Navy's most widely-used torpedo bombers in WW II and on into postwar service.

Photo: Editor's Collection

world at the time they entered service, they later proved to be disastrously obsolete when committed to combat during the early carrier battles of 1942. Curiously, the Navy issued no new specification for a carrier-based torpedo bomber until April 1940, when it ordered prototypes of the XTBF-1 from Grumman and the XTBU-1 from Vought. The TBF Avenger, also produced by General Motors as the TBM, entered service in mid-1942 and became the Navy's and the Marine Corps' premier torpedo-bomber of World War II.

Bomber-Fighters and Two-Place Fighters

BuAer's desire to combine a multiplicity of functions into one airframe led, between 1931-1934, to the relatively short-lived idea of bomber-fighters (BF)—single-seat fighters that possessed light dive-bombing capability. The first example of this concept (initially ordered as the XF6B-1 in 1931) was Boeing's XBFB-1 of 1933, a fixed-gear biplane with a 625 hp Pratt & Whitney R-1535 engine. Bearing a strong resemblance to its F4B-4 predecessor, the XBFB-1 was designed to carry a 500 lb bomb on the centerline or four 112 lb bombs on

wing racks in addition to machine gun armament. Under the same specification, two biplane designs by Curtiss were authorized in 1932—the fixed gear BFC-2 (initially XF11C-2) and the retractable-gear BF2C-1 (XF11C-3), both of which were powered by the Wright R-1820 and shared many airframe characteristics in common with the Army's P-6E. The Boeing entry was never placed into production, but Curtiss was more successful, manufacturing 27 BFC-2s and 27 BF2C-1s from mid-1933 to early-1934. The BF concept was abandoned after only a few years, however, and both Curtiss types had been withdrawn from active service by early 1938.

The retractable gear F11C-3 became the BF2C-1 in the bomber-fighter category.

Photo: Editor's Collection



The Curtiss-Wright F11C-2 fighter was redesignated BFC-2 in the bomber-fighter category.

Photo: Curtiss-Wright W-7791, 10/24/32, Editor's Collection



**Curtiss-Wright F8C-1
two-seat fighters were
redesignated OC-1.**

Photo: Editor's Collection



The two-seat fighter concept actually arose from a 1927 Marine Corps requirement for a multi-purpose airplane to fulfill the roles of fighter, dive-bomber, and observation platform during expeditionary campaigns. Curtiss responded by adapting its two-seat Army Falcon design (A-3) to a Pratt & Whitney R-1340 radial engine and offering it as the F8C-1. After delivery of 27 examples (25 to the USMC) in 1927-1928, Curtiss introduced the improved XF8C-2, which featured a balanced rudder, a strengthened and redesigned fuselage, and new equal-span wings. Other refinements included a telescopic sight for dive-bombing and two forward-firing .30-caliber machine guns in the upper wing. Dubbed the Helldiver, the type was thereafter ordered into production as the F8C-4 for the Navy and the F8C-5 for the Marines, with a total of 86 being delivered in 1930. The competing Vought XF2U-1 of 1929, a more powerful and heavily armed adaptation of the O2U, never reached production. As newer aircraft replaced them in the early 1930s, F8C-1s were re-designated OC-1s and

F8C-4s and -5s became O2C-1s, and both types were relegated to reserve status.

One of the most advanced two-seat, multi-role fighter concepts of this era was the Grumman FF-1 biplane, which flew in late 1931. The first in a great line of Grumman carrier aircraft, the XFF-1 was designed with an all-metal fuselage, hand-operated retractable landing gear, and enclosed canopies for the pilot and gunner/observer. Equipped with a 750 hp R-1820 engine, its 201 mph top speed was higher than any single-seat naval fighter of the day. The Navy ordered 27 as the FF-1 and a further 33 as the SF-1 two-seat scout, and both types remained in active service until 1936. New BuAer requirements issued in 1931-1932 generated four more two-seat fighter-bomber designs: the Berliner-Joyce XF2J-1, the Douglas XFD-1, the Vought XF3U-1, and the Curtiss XF12C-1. All were fixed-gear biplanes with enclosed cockpits, except the XF12C-1, which featured a single, parasol-mounted upper wing and inward-retracting landing gear. The XF2J-1 and



**The Curtiss-Wright F8C-4
and -5 Helldiver two-seat
fighters became O2C-1s in a
designation and mission
change.**

Photo: Curtiss-Wright 3926B, 8/12/30,
Editor's Collection



Another two-seat fighter was the Grumman FF-1. Its two-seat scout variant, the SF-1, is illustrated here.

Photo: Editor's Collection

Marine Corps de Havilland DH-4Bs like this one were used in developing early dive bombing techniques in 1927.

Photo: Editor's Collection



The Martin T5M was approved for Navy service and given the designation BM-1 in the new bomber series. Note the sling beneath the nose of this BM-1 to make sure the bomb clears the prop when released in a dive.

Photo: Glenn L. Martin Co., Editor's Collection

XFD-1 were cancelled following flight trials; however, the Curtiss and Vought designs were both returned to the factory for modifications, reemerging in 1934 as the SBC-1 and SBU-1, respectively, which effectively spelled the end of the two-seat fighter-bomber concept.

Scouts, Bombers, and Scout-Bombers

The Marine Corps, using a handful of antiquated DH-4Bs, is credited with developing the first combat-tested dive-bombing techniques during the Nicaraguan campaign of 1927. The idea of building a carrier-based plane strong enough to deliver a 1,000 lb bomb in this manner against a ship target prompted BuAer, in 1928, to issue its first specification for a purpose-built

“dive-bomber.” After that, prototypes were authorized from Martin as the R-1690-powered XT5M-1 and from the Naval Aircraft Factory as the R-1750-powered XT2N-1. Both airplanes were surprisingly similar in construction and appearance: metal-framed, fabric-covered equal-span biplanes, tandem open cockpits for pilot and gunner/observer, and a metal crutch on the belly designed to swing the large bomb past the propeller arc. Testing of both prototypes completed in 1930 resulted in the selection of the Martin’s T5M-1, under the new bomber (B) designation BM-1, with orders placed for 12 aircraft. In late 1931, the Navy purchased 16 BM-2s, which differed from the -1 only in small details. BM-1s and -2s remained with active fleet



Great Lakes BG-1s served the Navy and Marines throughout the mid- and late '30s.

Photo: Editor's Collection

squadrons until 1937, when they were supplanted by newer SB types entering service.

In 1931 the Navy briefly evaluated the Consolidated XBY-1, an R-1820-engined high-wing monoplane based upon that company's Fleetster commercial design. Though fast by the standards of the day (181 mph top speed), it was ultimately deemed too large for carrier storage and unsuitable for dive-bombing. A more conventional BuAer dive-bomber requirement issued in 1932 gave rise to a competition between the Great Lakes XBG-1 and Consolidated XB2Y-1, both of which were fixed-gear biplanes powered by 700 hp R-1535 engines. After both types flew in mid-1933, the BG-1 proved to be superior in testing, which resulted in a production contract for 60 examples delivered during 1934-1935, with half of that number being assigned to the Marine Corps. The type continued in active service with the Navy until 1938 and with the Marines until 1940.

The Navy first assigned the scout (S) designation in

1931 to the Vought SU series, a derivative of the O3U with a more powerful engine and greater fuel capacity, yet lacking any real offensive capability. The first scouting type with bona fide attack potential was the Curtiss XS2C-1 of late 1932, which was essentially a navalized version of the Army's A-10 *Shrike* monoplane. After a short period of evaluation, however, it was considered unsuitable for carrier operations. More promising was Vought's XSBU-1 biplane (formerly XF3U-1), which was returned to the Navy for new trials in early 1934. Eighty-four were ordered in 1935 as the SBU-1 and 40 more in 1936 as the SBU-2, but their active service was very brief, with most having been downgraded to reserve status by the end of 1937.

1934 was certainly a benchmark year in naval aircraft procurement. Besides the torpedo-bomber competition mentioned earlier, BuAer also solicited multiple proposals for simultaneous biplane and monoplane prototypes under the new scout-bomber specification. A large part

A Vought SBU-1, an example of the Navy's scout-bomber series. The SBUs had a relatively short service life.

Photo: Editor's Collection



The Curtiss-Wright SBC-3 emerged as the winner of the Navy's scout-bomber competition of 1935-36.

Photo: Editor's Collection



of this was induced by the fact that one new carrier—*Ranger*—had joined the fleet in 1934 and two more—*Yorktown* and *Enterprise*—were scheduled to follow within a few years. Thus, in addition to replacing obsolescent types, the Navy would need as many as 220 more new planes to equip the forthcoming air groups. Beginning in late 1935 and continuing through the balance of 1936, the Navy tested no less than seven different SB prototypes—four biplanes and three monoplanes—built by six different airframe manufacturers, and with the apparent aim of simplifying maintenance and overhaul procedures, six of the seven were to be designed around Pratt & Whitney's twin-row R-1535 powerplant (note, the Brewster XSBA-1, equipped with a Wright R-1820, was the exception).

While available reference material doesn't indicate exactly who was competing against whom, it appears, chronologically at least, that the first group of scout-bomber rivals was all biplanes, consisting of the Curtiss

XSBC-2 (a completely new design, not a development of the XSBC-1 monoplane), the Great lakes XB2G-1 (a retractable-gear variation of the BG-1), and the Grumman XSBF-1 (a re-engined development of the FF/SF series). Testing of the prototypes in late 1935-early 1936 resulted in Curtiss being declared the winner with a contract for 84 aircraft to be produced as the SBC-3. In 1938 Curtiss introduced the improved SBC-4 which, equipped with a 950 hp R-1820 engine and other refinements, raised bomb load to a far more lethal 1,000 lbs. The last 50 of 125 SBC-4s built for the Navy (which were specially intended to replace 50 that had been lend-leased to Britain) were delivered in early 1941, making it the last type of military combat biplane of any type to be manufactured in the U.S.

The second, slightly later, group was composed of three monoplanes—the Vought XSB2U-1, the Brewster XSBA-1, and Northrop XBT-1—and one biplane—the Vought XSB3U-1 (essentially a SBU-2 with retractable



A Vought SB2U-2 with the distinctive markings of the Commander Wasp Air Group.

Photo: Editor's Collection

The Northrop BT-1 showing its split-type, perforated trailing edge flaps.

Photo: Editor's Collection



The BT-1's landing gear retracted aft into external housings under the wings. This is the XBT-2, a BT-1 modified with fully retractable landing gear.

Photo: Editor's Collection



The Northrop XBT-2 further modified with aerodynamic refinements and clearly showing its final evolution to what became the Douglas SBD in production.

Photo: Editor's Collection



landing gear). The XBT-1 was delivered to the Navy for testing in December 1935 and the other three arrived in April 1936. Inasmuch as BuAer still entertained serious reservations over monoplanes, the XSB3U-1 represented an obvious hedge against the possibility that the other three designs might fail to work out. As events turned out, the monoplanes generally out-performed the biplanes in terms of maximum and cruising speeds (and thus time to target) and equaled them in terms of range and payload, while still demonstrating acceptable approach speeds and wave-off characteristics. In an effort to more rapidly equip its emerging carrier force, the Navy ordered *all three* of the monoplane SB designs into production. As to the SB2U, Vought delivered 169 aircraft during 1937-1940 to the Navy and the Marine Corps in three versions (i.e., SB2U-1, -2, and -3) and built an additional 50 for the British Fleet Air Arm. SB2Us, despite being a very advanced aircraft at the time of their operational debut, were quickly overtaken by newer types so that by December 1941, they were serving in only two Marine frontline squadrons.

The Northrop XBT-1 exhibited performance comparable to the SB2U and shared many of the characteristics of that company's fixed-gear A-17, built for the Army. By encasing the landing gear in streamlined fairings that retracted against the bottom surface of the wing, the A-17 center-section was little changed. And to solve the problem of severe buffeting at high diving speeds, the BT-1 was the first dive-bomber to introduce split-type, perforated trailing edge flaps. After acceptance in late 1936, the Navy ordered 54 BT-1s with deliveries commencing in November 1937. At the time Northrop's name was changed to the El Segundo Division of Douglas Aircraft in 1938, the company was completing work on its BT-2, which came with a more powerful (1,000 hp vs. 825 hp) R-1820 engine and redesigned landing gear that retracted flush into the wing roots. In 1939, further refinements such as a reshaped fin/rudder and new canopy resulted in a definitive model, which was thereafter ordered into production in 1939 as the SBD-1. The Navy had originally planned to terminate SBD production in early 1942 after delivery of 174

When Northrop became the El Segundo Division of Douglas in 1938, further design and development led to the SBD-1 Dauntless which was to become widely used by the Navy as well as the Army (as the A-24) in WW II. Photo: Editor's Collection



SBD-1s, -2s, and -3s, but the onset of World War II kept the assembly line moving until mid-1944, after which time 5,267 SBDs in all versions had been delivered (including 615 built for the USAAF as the A-24).

The XSBA-1, the first original design from the Brewster Aeronautical Corporation, was laid down to a somewhat different requirement—an R-1820 engine and mid-wing planform with an internal bomb bay—and at 263 mph, it was the fastest of the group by a margin of 16 mph. The Navy issued a contract for 30 of the type, but oddly, not to Brewster. Because the company had no ostensible experience in manufacturing complete airframes, the production contract was awarded in September 1938 to the government-owned Naval Aircraft Factory under the new designation SBN-1. Production proceeded at a remarkably lethargic rate, however, with the first examples being delivered in late 1940 and the balance of the order not

arriving until mid- 1941 by which time the SBN-1 was virtually obsolete!

But in early 1939, BuAer was already viewing the SB2U, SBD, and SBN as mere stopgaps and had its eyes on bigger and better things. In April 1939, the Navy gave Brewster an order for its R-2600-powered Model 340 (XSB2A-1), which was expected to carry a 1,000 lb bomb load at 25% greater speed and range than the SBA. A month later, another contract was issued to Curtiss for development of the similarly powered XSB2C-1. The 302 Navy and Marine SB2As delivered between 1942 and 1944 never saw a shot fired in anger and were part of a larger corporate fiasco that ultimately spelled the demise of Brewster. At the same time, SB2C development became so protracted that it did not achieve operational status until late 1943, but nevertheless went on to redeem itself in the later carrier campaigns of World War II.



After a protracted development and production effort the Brewster-designed SBA-1 emerged from production as the Naval Aircraft Factory SBN-1 shown here, too little and too late to make a difference.

Photo: USN, Editor's Collection



Three hundred and two Brewster SB2A scout bombers were delivered to the Navy and Marines but none saw front line service.

Photo: Editor's Collection

Endnote

Whatever may be said about BuAer's sometimes divergent and confusing approach to attack aircraft development during the period mentioned, it did, in the end, lay the foundation for Navy and Marine aviation's tactical successes from mid-1942 onwards. Every torpedo and scout-bomber type used during the war was either already in production or under development before December 1941. These planes—namely, the SBD, the SB2C, and the TBF (TBM)—not only played a major role in checking the enemy onslaught across the Pacific, but also spearheaded the Navy and Marine advance to the Japanese Home Islands. Three cheers for BuAer!

Sources and References

Gordon Swanborough and Peter M. Bowers, *United States Navy Aircraft Since 1911*, Naval Institute Press, Annapolis, Maryland, 2nd ed., 1976.

Roger Chesneau, *Aircraft Carriers of the World,*

1914 to the Present, Naval Institute Press, Annapolis, Maryland, 1984.

Norman Friedman, *U.S. Naval Weapons*, Naval Institute Press, Annapolis, Maryland, 1985.

Roy A. Grossnick, *United States Naval Aviation 1910-1995*, Naval Aviation History Branch, U.S. Govt. Printing Office, Washington, D.C., 1996. (Available online in PDF format at www.history.navy.mil.)

Robert L. Lawson, Ed., *The History of U.S. Naval Airpower*, Crown Publishers, New York, New York, 1985.

Ray Wagner, *American Combat Planes*, Doubleday & Company, Garden City, New York, 3rd Ed., 1982.

Michael J. H. Taylor, *Warplanes of the World 1918-1939*, Charles Scribner's Sons, New York, New York, 1981.

Jack Dean, "Dive Bomber," *Wings*, Vol. 15, No. 2, Sentry Books, Granada Hills, California, April 1985.

Peter M. Bowers, "Scout Bomber," *Wings*, Vol. 15, No. 2, Sentry Books, Granada Hills, California, April 1985. ■

The Curtiss-Wright XSB2C-1, the first of many SB2C Helldivers delivered to the Navy in WW II.

Photo: Editor's Collection

