

= Martin AM Mauler =

The Martin AM Mauler (originally XBTM) was a single @-@ seat shipboard attack aircraft built for the United States Navy . Designed during World War II , the Mauler encountered development delays and did not enter service until 1948 in small numbers . The aircraft proved troublesome and remained in front @-@ line service only until 1950 , when the Navy switched to the smaller and simpler Douglas AD Skyraider . Maulers remained in reserve squadrons until 1953 . A few were built as AM @-@ 1Q electronic @-@ warfare aircraft with an additional crewman in the fuselage .

= = Design and development = =

In the 1930s and early 1940s , the Navy divided carrier @-@ borne bombers into two types : the torpedo bomber and the dive bomber , each with crews of two or three men . Wartime experience showed that pilots could aim bombs and torpedoes without assistance from other crewmembers as well navigate with the aid of radio beacons and the development of more @-@ powerful engines meant that faster aircraft no longer needed a rear gunner for self @-@ defense . Furthermore , the consolidation of the two types of bombers greatly increased the flexibility of a carrier 's air group and allowed the number of fighters in an air group to be increased .

In 1943 the US Navy invited proposals for a new multi @-@ purpose bomber and selected four designs in September : the Curtiss XBTC , Douglas XBT2D Skyraider , Kaiser @-@ Fleetwings BTK and the Martin XBTM . Martin was tasked to provide a back @-@ up to the Curtiss design which had been selected as a replacement to the Curtiss SB2C Helldiver . Due to the US Navy 's concern that the Curtiss design was overly complex and that the company 's record was particularly poor during the Helldiver 's development , Martin was instructed to create an " unexperimental " design that would be a reliable platform for the Pratt & Whitney R @-@ 4360 Wasp Major radial engine that powered both aircraft . Two prototypes were ordered from Martin on 31 May 1944 with the internal designation of Model 210 .

The XBTM @-@ 1 was a low @-@ winged , all @-@ metal monoplane with folding wings to allow more compact storage in carrier hangar decks and conventional landing gear . Its fuselage was an oval @-@ shaped stressed @-@ skin semi @-@ monocoque with the single @-@ seat cockpit and its teardrop @-@ shaped canopy positioned just aft of the air @-@ cooled engine . Just behind the cockpit was a 150 @-@ US @-@ gallon (570 l ; 120 imp gal) fuel tank . The large wing consisted of a two @-@ spar center section with hydraulically @-@ folded three @-@ spar outer panels . A large dive brake was positioned on the trailing edge of the wing . When closed it could be lowered for use as a landing flap or it could be split into alternating upper and lower section with inter @-@ meshing " fingers " for use in its intended role . It was very effective in this role , mainly due to its great surface area , but this was at the cost of the width of the ailerons , which significantly reduced their efficiency . A pair of 180 @-@ US @-@ gallon (680 l ; 150 imp gal) fuel tanks were positioned in the roots of the center section . All fuel tanks were self sealing and the pilot and oil cooler were protected by 297 pounds (135 kg) of armor .

The fixed armament of four 20 mm (0 @-@ 79 in) T @-@ 31 autocannon was fitted in the center section adjacent to the outer wing panels with 200 rounds per gun . A centerline hardpoint and a pair of outer hardpoints were installed on the center section and rated to take bombs , fuel tanks or torpedoes up to 2 @-@ 300 pounds (1 @-@ 043 kg) in weight . The outer hardpoints could also carry an AN / APS @-@ 4 search radar in a pod . A dozen hardpoints could be installed on the outer wing panels to carry 250 @-@ pound (113 kg) bombs or 5 @-@ inch (127 mm) High Velocity Aircraft Rockets . In service the Mauler earned the nickname " Able Mable " because of its remarkable load @-@ carrying ability , once lifting 10 @-@ 648 pounds (4 @-@ 830 kg) of ordnance (three 2 @-@ 200 @-@ pound (998 kg) torpedoes , a dozen 250 @-@ pound bombs plus its 20 mm guns and their ammunition) on 30 March 1949 , perhaps the heaviest load ever carried by a single @-@ engine , piston @-@ powered aircraft .

The first XBTM @-@ 1 made its maiden flight on 26 August 1944 and began flight testing after it reached the Naval Air Test Center (NATC) on 11 December . The Navy ordered 750 more aircraft

on 15 January 1945 although this was reduced to 99 aircraft after the surrender of Japan in August . The second prototype made its first flight on 20 May . Initial flight tests conducted with the first two prototypes revealed significant problems with the engine , its cowling , the vertical stabilizer and rudder . In response , the cowling was lengthened 6 inches (152 mm) and the engine mount was canted two degrees to the right to offset the engine 's tremendous torque . The length of the carburetor air scoop was extended and the propeller spinner , rudder , and the vertical stabilizer were redesigned . In April 1946 the aircraft designation was changed to AM @-@ 1 when the Navy replaced its Bomber @-@ Torpedo classification with Attack , well before the redesign was completed in early 1947 .

First deliveries began in March 1947 and a flight test program began that month that lasted three years before the major deficiencies identified were fully corrected . Carrier landing trials revealed a structural weakness of the rear fuselage when one aircraft was severed in half during a heavy landing . Severe vibrations in the tail upon engaging the arresting wire were cured by adding a roller bearing to the tailhook to counter the sideways forces placed on the tailhook . Other necessary changes were the addition of spoiler ailerons and an elevator control boost to improve the aircraft 's poor controllability at low speeds . In addition the cockpit layout was unsatisfactory and had to be redesigned . The NATC finally deemed the Mauler acceptable for carrier landings in August 1948 even though aircraft had been issued to one squadron earlier in the year and a new batch of 50 aircraft had been ordered in May . Despite all of the modifications to the aircraft over its short life , it remained a maintenance nightmare , especially the leaky hydraulic systems .

The AM @-@ 1Q was developed for electronic countermeasures (ECM) duties . The fuselage fuel tank was removed to make room for the ECM operator and his equipment in a windowless compartment . The aircraft carried several radio and radar receivers , transmitters and a signal analyzer . The operator could also drop bundles of chaff through a chute to block radar signals .

Pilots found the Mauler a heavy handling aircraft that was difficult to fly in formation , and hard to land aboard a carrier because a less than perfect landing often caused the aircraft to bounce over the arresting wires and into the safety barrier . It was a very stable dive bomber , more so than the Skyraider , and could carry more ordnance . Maintenance problems and the difficulty of landing aboard a carrier caused some pilots give it the nickname of " Awful Monster " .

= = Operational history = =

With the prospect of flying the AD @-@ 1 Skyraider and AM @-@ 1 in carrier operations , the US Navy assigned the Maulers to Atlantic Fleet squadrons . Attack Squadron 17A (VA @-@ 17A) was the first unit to get the AM @-@ 1 and received its 18 aircraft in March and April 1948 . It was redesignated as VA @-@ 174 on 11 August and began carrier qualification trials aboard the USS Kearsarge on 27 ? 28 December and completed them aboard the USS Leyte in January 1949 with all assigned pilots completing their day qualifications . During this latter deployment the squadron participated in the unsuccessful search for a British South American Airways Avro Tudor airliner missing in the Caribbean . The squadron made a brief deployment aboard the USS Midway , one of the largest carriers in the US Navy , in early 1949 . The longer flight deck of the Midway @-@ class carriers made landings easier for the AM @-@ 1 pilots and the squadron did not have a single landing accident during its deployment . Upon its return the unit transferred its aircraft to VA @-@ 44 and VA @-@ 45 , both newly assigned to the Midway , and converted to the Skyraider before being disbanded in January 1950 .

The two squadrons began receiving their aircraft in March 1949 and conducted their carrier qualifications from 2 to 7 May . VA @-@ 45 became the only Mauler squadron to complete qualification without any accidents . They made a short deployment aboard the carrier from 1 to 9 September and began converting back to Skyraiders the following month .

Carrier Air Group 8 (CVG @-@ 8) was established on 15 September 1948 in response to the Berlin Blockade with newly qualified pilots and reservists who volunteered for active duty . VA @-@ 84 and VA @-@ 85 , the air group 's attack squadrons , began receiving Maulers in November and the last aircraft was delivered in January 1949 . Later that month the air group made a flyover of

President Harry Truman 's Inauguration ceremony . The squadron conducted their qualifications aboard the Midway from 3 to 6 May with 10 Maulers crashing into the safety barrier between them . CVG @-@ 8 made a two @-@ week cruise aboard the Midway beginning on 27 June along the East Coast of the United States before it was disbanded in November after the peaceful resolution of the Berlin Blockade .

Many of the AM @-@ 1Q electronic @-@ warfare variants were assigned to Composite Squadron 4 (VC @-@ 4) , based at NAS Atlantic City , and were detached in small groups for each Atlantic Fleet carrier deployment . Little is known about their service and the squadron is last known to have Maulers assigned on 1 October 1950 .

Although the Skyraider was a third smaller and carried a third less bombload , it proved more reliable in service and easier to fly and land , and Navy pilots preferred it . In 1950 the decision was made to use the Mauler only from shore @-@ based units and later that year all but Naval Reserve units abandoned the type . The aircraft operated with reserve squadrons until 1953 .

= = Variants = =

XBTM @-@ 1

Two prototypes built .

BTM @-@ 1 / AM @-@ 1

A total of 131 production aircraft , another 651 aircraft were cancelled .

AM @-@ 1Q

A electronic @-@ warfare variant , 18 aircraft built and / or converted .

JR2M @-@ 1

Proposed carrier onboard delivery variant of the AM , named Mercury ; not built .

= = Operators = =

United States

United States Navy

VA @-@ 44 , VA @-@ 45 , VA @-@ 84 , VA @-@ 85 , VA @-@ 174 , VC @-@ 4 .

Reserve attack squadrons at NAS Grosse Ile , NAS St. Louis , NAS Glenview , NAS Dallas , NAS Columbus , and NAS Atlanta .

= = Survivors = =

Out of 151 Maulers built , only four complete air @-@ frames are known to still exist with a fifth partial air @-@ frame in storage :

On display

AM @-@ 1

122397 - National Naval Aviation Museum in Pensacola , Florida .

22275 - Tillamook Air Museum , Tillamook , Oregon . (formerly from the Erikson Aircraft Collection in Madras , Oregon)

In storage or under restoration

AM @-@ 1

22260 - this aircraft formerly belonged to the Commemorative Air Force (formerly the Confederate Air Force) . In storage , (along with 122401) at the Glenn L. Martin Maryland Aviation Museum in Middle River , Maryland . Not currently listed on the museum 's website and the museum did not respond to a query on its status . Previously restored to airworthy status in 1984 and subsequently crashed same year .

122401 - Partial air frame stored (along with 22260) , at the Glenn L. Martin Maryland Aviation Museum in Middle River , Maryland .

122403 - in storage at the Planes of Fame in Chino , California as of 2014 .

= = Specifications (AM @-@ 1 Mauler) = =

Data from American Combat Aircraft of the 20th Century

General characteristics

Crew : 1 (2 for AM @-@ 1Q)

Length : 41 ft 3 in (12 @.@ 57 m)

Wingspan : 50 ft 0 in (15 @.@ 24 m)

Height : 16 ft 10 in (5 @.@ 13 m)

Wing area : 496 sq ft (46 @.@ 1 m²)

Empty weight : 15 @, @ 257 lb (6 @, @ 920 kg)

Gross weight : 25 @, @ 737 lb (11 @, @ 674 kg)

Fuel capacity : 510 US gallons (1 @, @ 900 l ; 420 imp gal)

Powerplant : 1 × Pratt & Whitney R @-@ 4360 @-@ 4 Wasp Major Radial , 3 @, @ 000 hp (2 @, @ 200 kW)

Propellers : 4 @-@ bladed , 14 ft 8 in (4 @.@ 47 m) diameter

Performance

Maximum speed : 334 mph (538 km / h ; 290 kn)

Cruise speed : 189 mph (164 kn ; 304 km / h)

Combat range : 1 @, @ 524 mi ; 2 @, @ 452 km (1 @, @ 324 nmi)

Service ceiling : 27 @, @ 000 ft (8 @, @ 230 m)

Time to altitude : 5 @.@ 9 minutes to 10 @, @ 000 feet (3 @, @ 048 m)

Wing loading : 48 @.@ 7 lb / sq ft (238 kg / m²)

Armament

Guns : 4 × 20 mm (0 @.@ 79 in) T @-@ 31 cannon @ 200 r.p.g.

Hardpoints : 15

Rockets : 12 × 5 @-@ inch (130 mm) HVAR

Missiles : 3 × Mark 13 torpedoes