

Savoia Marchetti Sm 81

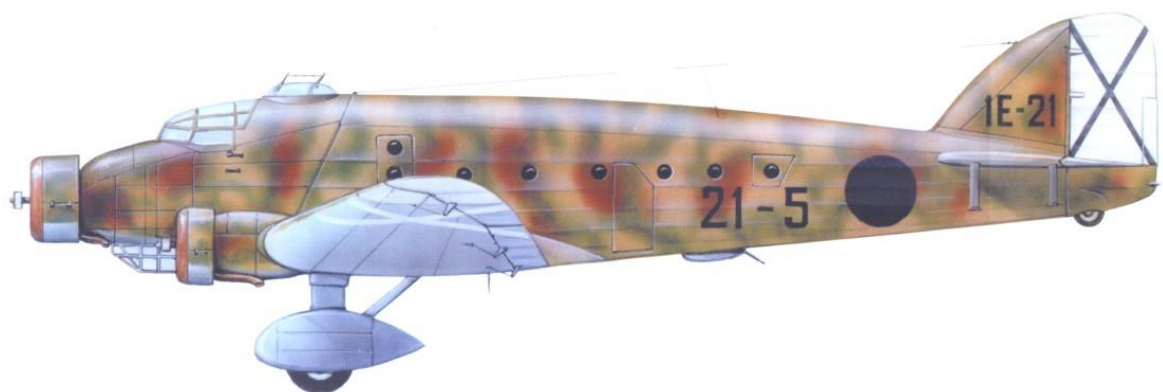


Parmi les types d'aéronefs qui existèrent durant la Seconde Guerre mondiale et disparurent par la suite figure les « bombardiers de transport ». Des appareils hybrides, généralement conçus pour l'une des missions et adaptés à la va-vite pour la seconde. Dans la grande majorité des cas cela ne donna pas des résultats particulièrement probants. L'un des avions bien représentatifs de cela est un trimoteur italien, bombardier de qualité mais avion de transport plus que modeste : le **Savoia-Marchetti SM.81 Pipistrello**. Les origines de cet avion remontent au Savoia-Marchetti SM.73, un avion de ligne apparu en Italie au cours de l'année 1934 et qui connut un succès d'estime, notamment en Belgique et en Tchécoslovaquie. Une quarantaine de SM.73 fut construite, dont quelques exemplaires pour la *Regia Aeronautica*. Dès la fin 1934, l'idée d'en dériver une version militaire destinée à des missions de bombardement germa dans le cerveau de ses concepteurs. En fait le nouvel avion reprenait en grande partie les éléments de l'avion de ligne. Son fuselage fut cependant légèrement rallongé, son empennage redessiné, et on renforça son train d'atterrissage ajoutant des carénages aux roues. Par ailleurs une soute à bombes fut installée en lieu et place de la cabine passager tandis qu'un poste de tir dorsal pour deux mitrailleuses était greffé à l'avant du fuselage. Des sabords latéraux furent ouverts, ainsi qu'une trappe de planché permettant l'installation à chaque fois d'une mitrailleuse mobile. Il fut officiellement désigné **SM.81 Pipistrello**. En fait extérieurement le nouvel avion italien était bien dans l'air du temps de cette seconde moitié des années 1930. Trimoteur à aile basse cantilever construit en métal et contreplaqué, sa propulsion était assurée par des moteurs en étoile Romeo 125 RC-35 d'une puissance nominale de 650 chevaux. Outre ses cinq mitrailleuses de calibre 7.7mm le **Savoia-Marchetti SM-81 Pipistrello** pouvait emporter une charge offensive de 1000 kg en soute. C'est dans cette configuration générale que l'avion réalisa son premier vol en février 1935.

Il fut immédiatement commandé en série par la *Regia Aeronautica*. Pour des raisons purement techniques, liées à la disponibilité des moteurs Romeo 125 RC-35 certains exemplaires furent construits avec d'autres motorisations, et notamment des Piaggio P.IX d'une puissance légèrement supérieure. Les **Savoia-Marchetti SM-81** de série entrèrent en service à l'été 1935. À cette époque il s'agissait d'un bombardier le plus moderne en service en Italie. Dès l'année suivante l'avion fut engagé de manière opérationnelle en Espagne, au sein de l'*Aviazione Legionaria* en soutien des troupes du général Franco en lutte contre les forces républicaines. Des **SM-81** italiens furent notamment employés pour bombarder la ville de Bilbao et ses faubourgs. La cinquantaine de Pipistrello engagés y déversèrent des tonnes de bombes, notamment incendiaires, durant près de deux jours. Assez peu de ces bombardiers furent perdus durant ce conflit. En 1940 après que l'Italie fasciste ait déclaré la guerre à la France, quelques jours seulement avant sa chute, des **SM-81 Pipistrello** furent employés pour bombarder des positions françaises près de Nice. Ils réalisèrent également un raid aérien contre l'hydrobase de Fréjus, ne réussissant à détruire que deux Potez 452. Au moins trois bombardiers italiens furent défaits par la DCA française. Les forces fascistes engagèrent également leurs **Savoia-Marchetti SM-81 Pipistrello** dans des opérations de bombardement au-dessus des territoires grecs et soviétiques. Sur ce second front une partie des bombardiers fut dotée d'une tourelle ventrale en lieu et place de la trappe initiale. Le Savoia-Marchetti SM-81 Pipistrello fut l'un des principaux bombardiers italiens de ce conflit. La mission de transport apparut finalement assez tardivement. Les premiers appareils de ce type ne furent pas employés avant 1939. Leur généralisation date de 1942 sur l'ensemble des fronts. Il est à signaler qu'une quinzaine de ces trimoteurs de transport furent utilisés entre 1943 et 1945 au sein du *Transportgruppe 10*, une unité logistique de la *Luftwaffe* dont les mécaniciens et pilotes étaient des volontaires italiens. Leurs **SM-81T Pipistrello** volaient de conserve avec des [Junkers Ju 52/3](#). Il est à noter que plusieurs avions abattus de cette unité furent revendiqués comme Junkers par les Alliés alors qu'il s'agissait vraisemblablement de SM-81. La ressemblance entre les deux avions était en effet assez frappante, surtout pour des pilotes ennemis. Quelques SM-81T furent utilisés pour des missions de soutien logistique par les forces cobelligérantes, ces aviateurs italiens qui dès 1943 rejoignirent le camp allié. Au final le **Savoia-Marchetti SM-81 Pipistrello** a été construit à environ 535 exemplaires, dont au moins 115 étaient des avions-cargos. Il est à signaler que 97 bombardiers construits entre 1940 et 1941 furent motorisés avec des Gnome & Rhône 14K saisis en France occupée. Les derniers avions, des appareils de transport, quittèrent le service après-guerre, en 1950. Ils volaient au sein de l'*Aeronautica Militare Italiana*. Enfin il est important de savoir que malgré sa désignation laissant supposer le contraire, le **SM-81 Pipistrello** est antérieur au [SM-79 Sparviero](#).

Savoia Marchetti Sm81 :

- 3 Moteur Piaggio PX RC 35
- 3 x 700 Ch
- 340 Km/h
- 5 Mitrailleuses 7.7 mm 2000 Kg de bombes
- 9300 Kg en charge
- 9000 m de plafond pratique
- 2000 Km en distance franchissable
- 5 Equipiers





Source : <https://www.avionslegendaires.net/avion-militaire/savoia-marchetti-sm-81-pipistrello/>

The **Savoia-Marchetti SM.81 *Pipistrello*** (Italian: *bat*) was the first [three-engine bomber/transport](#) aircraft serving in the [Italian Regia Aeronautica](#).^[2] When it appeared in 1935, it represented a real step ahead in Italian military aviation: it was fast, well armed and had a long range.^[2] It proved effective during the [war](#) with [Ethiopia](#) and the [Spanish Civil War](#).^[2] Despite being too slow to remain competitive as a bomber in the later years of [World War II](#), it was one of the most flexible, reliable and important aircraft of the *Regia Aeronautica* from 1935 to 1944, and adapted to second-line duties in a wide range of tasks.

Design and development

The SM.81 was a militarised version of [Savoia-Marchetti's](#) earlier [SM.73 airliner](#), having [cantilever](#) wings, three engines and a fixed [undercarriage](#). The origins of this version were in pursuit of the interests of [Italo Balbo](#), a brilliant exponent of the [Fascist](#) regime (but nevertheless "exiled" in Libya by [Mussolini](#)), who required a fast and efficient aircraft that was capable of serving the vast Italian colonies in Africa. The SM.81 had wings that were roughly similar to those of the double-[fuselage S.55](#), and identical to those of the [S.73](#), but had a much simpler fuselage. Around six months after the SM.73s first appearance, the SM.81 [prototype](#) (MM.20099) first flew from [Vergiate](#), near [Varese](#), on 8 February 1934, controlled by test pilot Adriano Bacula.^[3] The first *serie*, ordered in 1935, was for 100 aircraft and was quickly put into production as a result of the international crisis and the embargo caused by the war in [Ethiopia](#). The first examples were sent to 7 Wing at [Campo della Promessa](#) airbase near [Lonate Pozzolo](#). Although it was quickly superseded as a front-line bomber, the SM.81 continued to serve as a transport by virtue of its wide fuselage, which allowed it to accommodate a wide range of loads. Apart from its speed, it was generally superior to the [SM.79 Sparviero](#) as a multirole aircraft.

Overall characteristics

The SM.81 was a robust, three-engine [monoplane](#), with a fixed [tailwheel undercarriage](#), with the mainwheels enclosed by large spats to reduce drag, and had a crew of six.^[4] The aircraft was of mixed construction: the fuselage had a framework of steel tubes with a metallic-covered aft portion, while the rest was wood- and fabric-covered. It had a relatively large fuselage, an unnecessary characteristic for a bomber, which determined its future as a transport aircraft. Since the engines were quite small, the fuselage did not blend well with the nose engine, even less so than the SM.79. Many windows were present to provide the fuselage interior with daylight, giving the impression that it was a passenger aircraft. The all-wooden wings had three [spars](#) to provide the necessary support, whereas the semi-elliptical tail surfaces were fabric-covered metal. The pilot and co-pilot were seated side-by-side in an enclosed [cockpit](#), with separate cabins for the flight engineer and the radio-operator/gunner behind the cockpit.^[5] The bomb bay was behind the cockpit, together with a passage which linked the mid and aft fuselage, where there were three further defensive positions. The [bombardier's](#) position was located just below the cockpit, in a semi-retractable gondola,^[5] and differed from that of the SM.79, being both larger and in a location which was more favourable for communicating with the crew, and provided excellent visibility thanks to the glazed panel. Both this position and the cockpit had escape hatches, but for normal entry and exit there was a door in the left, mid-fuselage, and one in the aft fuselage. Equipment included an RA 350I radio-transmitter, AR5 radio-receiver, and a P63N radiocompass (not always fitted), while other systems comprised an electrical generator, fire extinguishing system, and an OMI 30 camera (in the gunner's nacelle). The aircraft, having a large wing and robust undercarriage, was reliable and pleasant to fly, and could operate from all types of terrain. It was surprisingly fast for its time and, given the power of its engines, especially compared to the similar [Junkers Ju 52](#). It was better armed than the SM.79, but the increased drag combined with the same engine power reduced the maximum speed and cruise speeds as well as the range. No armour was fitted, except for the [self-sealing fuel tanks](#).

Armament

The SM.81 was equipped with six machine guns providing a heavy defensive armament for a 1935 aircraft. Two powered retractable [turrets](#), one dorsal (just behind the pilots' seats) and one ventral-aft, were each fitted with 7.7 mm (0.303 in) [Breda-SAFAT machine guns](#), while single 7.7 mm (.303 in) [Lewis Guns](#) were mounted to fire through lateral hatches.^[5] The turrets were rotated by a "Riva-Calzoni" hydraulic system, while the guns' elevation was manual, and manual back-up mechanisms were provided for both the retracting and rotating systems.

Once retracted, only the upper part of the turret was visible, with the gun barrels positioned vertically, one aft of the other to reduce drag, giving the impression that the aircraft had additional antennae. Given the SM.81's cruise speed of around 270 km/h (170 mph) and the presence of a massive fixed undercarriage, the aerodynamic gain was relatively small. The ventral turret was operated in a different fashion to those fitted to other aircraft where the gunner occupied the ball- or dustbin-shaped structure; instead, due to lack of space, the gunner crouched in the fuselage with his head down inside the turret. This proved not to be very effective as were most ventral turrets and they were not fitted to further Savoias, although Piaggio fitted a dustbin-style turret accommodating the gunner to their [P.108](#). Both flanks were covered by one single and one twin gun installation. Initially six 7.7 mm (.303 in) [Vickers machine guns](#) were fitted, but these were later replaced by reliable, if not very fast-firing models made by Breda, together with 500 rounds per gun. The SM.81's bomb bay was divided into two parts with a passage linking aft and mid fuselage between, and could accommodate a wide range of ordnance up to a total of 2,000 kg (4,410 lb) over short ranges, with individual bombs of up to 500 kg (1,100 lb), arranged either horizontally or vertically.^[5]

- 4 × 500 kg (1,100 lb) (stored horizontally)
- 4 × 250 kg (550 lb) (ditto)
- 16 × 100 kg (220 lb) (stored vertically, as all the smaller ones), true weight around 130 kg (287 lb)
- 28 × 50 kg (110 lb) (true weight, around 70 kg/150 lb)
- 56 × 31 kg (68 lb), 24 kg (53 lb), 20 kg (40 lb), or 15 kg (33 lb)
- 1,008 × 2 kg (4 lb) (true weight, around 1,700 kg/3,750 lb)
- Incendiary bombs

The bomb-release mechanism was located on the right side of the bombardier's position. The SM.81's defensive armament was better than its successor, the SM.79, and even than that of the SM.84, although of smaller calibre, but still insufficient when faced with modern enemy fighter opposition. It was also capable of carrying a greater bombload than the SM.79, due to its wide fuselage.

Propulsion

The SM.81 had a three-engine configuration, but unlike the *Sparviero*, was fitted with a wide range of engines throughout its production:

- [Alfa Romeo 125 RC.35](#), 432–507 kW (580–680 hp). 192 built.^[3]
- [Gnome-Rhône 14K](#), 485–746 kW (650–1,000 hp). 96 built.^[3]
- [Piaggio P.X R.C.15](#), 501–522 kW (670–700 hp) – 48 built.^[3]
- [Piaggio P.IX R.C.40](#), 507 kW (680 hp) – 140 built.^[3]
- [Alfa Romeo 126 RC.34](#), 582–671 kW (780–900 hp), also fitted to early versions of the SM.79. 58 built.^[3]

In addition, one aircraft, the SM.81B, was built in a twin-engined configuration, powered by two 627 kW (840 hp) [Isotta-Fraschini Asso XI](#) inline engines and a streamlined, glazed nose. It had inferior performance to the three-engined versions and was not taken further.^[6]

Fuel

The fuel tanks, as was standard for Italian multi-engined aircraft, were metal [self-sealing fuel tanks](#) using materials developed by [SEMAPE](#), the specialized manufacturer. Eight tanks were fitted, with six in the centre wing (4 × 150 L/40 [US gallon](#) and 2 × 1,140 L/301 US gal tanks) and two 370 L (100 US gal) tanks (or 780 L/210 US gal with Gnome-Rhône 14K engines) in the outer wings. This gave an overall fuel capacity of 3,620 or 4,400 L (960 or 1,160 US gal).

Operational history



Savoia-Marchetti S.M. 81

The SM.81 first saw combat during the [Second Italo-Abyssinian War](#), where it showed itself to be versatile serving as a bomber, transport and [reconnaissance aircraft](#). SM.81s also fought in the [Spanish Civil War](#) with the [Aviazione Legionaria](#) and were among the first aircraft sent by the [fascist](#) powers to [airlift aid](#) to [Francisco Franco](#). Despite their obsolescence, by 1940, when Italy became involved in [World War II](#), around 300 (290–304 depending on source) SM.81s were in service with the *Regia Aeronautica*. The first Italian aircraft to enter action in East Africa were a pair of SM.81s. On 11 June 1940, one of them attacked [Port Sudan](#) and the other flew a reconnaissance flight over the [Red Sea](#). That same night, three SM.81s took off to bomb [Aden](#), but one turned back, and one of the other two hit a hill near [Massawa](#) while trying to land.^[7] A further flight was concurrently deployed against Anglo-Rhodesian defensive positions in [British Somaliland](#) immediately before the decisive [Battle of Tug Argan](#), presaging a limited role as a [tactical bomber](#).^[8] Its low speed and vulnerability to [fighter aircraft](#) meant that during daytime the SM.81 was restricted to second line duties, finding use as a transport. At night it was an effective bomber, particularly in the [North African theatre](#). Anti-ship actions were also carried out, but without significant success. Most SM.81s were withdrawn by the time of the [Italian armistice](#) of 1943, though some remained in service with both the [Italian Social Republic](#) and the [Italian Co-Belligerent Air Force](#). Several examples survived the war and went on to serve with the [Aeronautica Militare Italiana](#), but by 1950 these had all been retired. SM.81s serving in Ethiopia had markings applied to distinguish them in SAR missions. The normal camouflage pattern was yellow, green and brown. The all-over dark olive green scheme was introduced later, when the aircraft were used only in transport missions.

Specifications (Savoia-Marchetti SM.81b with Alfa Romeo 125 R.C.35 engines)

General characteristics

- **Crew:** 6
- **Length:** 18.3 m (60 ft 0 in)
- **Wingspan:** 24 m (78 ft 9 in)
- **Height:** 4.3 m (14 ft 1 in)
- **Wing area:** 92.2 m² (992 sq ft)
- **Empty weight:** 6,800 kg (14,991 lb)
- **Gross weight:** 9,300 kg (20,503 lb)
- **Max takeoff weight:** 10,505 kg (23,160 lb)
- **Powerplant:** 3 × [Alfa Romeo 125 R.C.35](#) 9-cylinder air-cooled radial piston engine, 485 kW (650 hp) each
- Alternative engines:- [Piaggio P.X R.C.15](#), [Alfa Romeo 126 R.C.34](#) or [Gnome-Rhône 14K](#)
- **Propellers:** 3-bladed propellers

Performance

- **Maximum speed:** 340 km/h (210 mph, 180 kn) at 4,000 m (13,123 ft)
- **Cruise speed:** 260 km/h (160 mph, 140 kn)
- **Minimum speed:** 110 km/h (68 mph; 59 kn)
- **Range:** 1,500 km (930 mi, 810 nmi)
- **Combat range:** 430 km (270 mi, 230 nmi) with 2,000 kg (4,409 lb) bomb load
- **Ferry range:** 2,000 km (1,200 mi, 1,100 nmi)
- **Service ceiling:** 7,000 m (23,000 ft)
- **Time to altitude:**
 - 1,000 m (3,281 ft) in 4 min 15 s
 - 3,000 m (9,843 ft) in 11 min 48 s
 - 5,000 m (16,404 ft) in 20 min 36 s
- **Wing loading:** 101 kg/m² (21 lb/sq ft)

Armament

- **Guns:** 6 × 7.7 mm (.303 in) [Breda-SAFAT machine guns](#)
- **Bombs:** Up to 2,000 kg (4,409 lb) of bombs

