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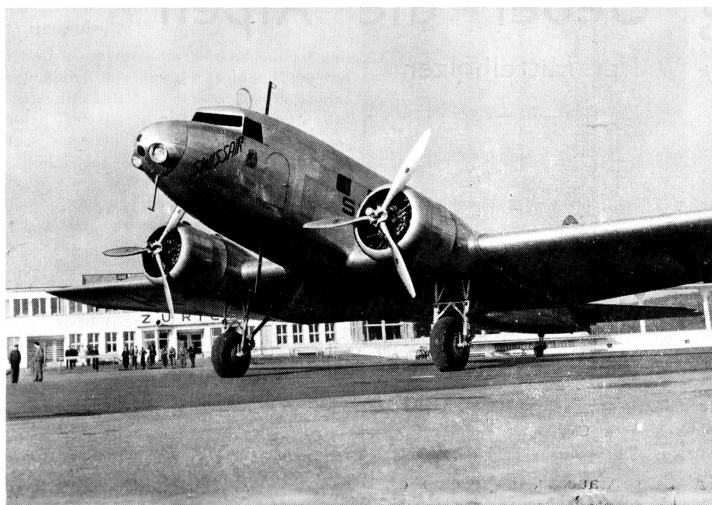
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"Swissair's" New High Speed Air Liners

By Walther Ackermann, *Flight Captain of "SWISSAIR"*

When the French aviator, M. Bossoutrot, who, at the age of 45 has flown over 1½ million kilometers in all, had crossed the South-Atlantic four times within three weeks, all strictly according to schedule, great receptions were held and honours were showered upon him in Paris. M. Bossoutrot cared little for all the enthusiasm shown and declared: "I think it perfectly ridiculous, making of me a demigod, running the risk of death through ocean storms in order to conquer the demons of sea and air. The heroic period of the Knights of the Air is past, when personal daring and superhuman genius of the pilot tamed the opposing might of the air. To-day the real heroes of aeronautics are the airplane and its engines."



The layman admires the performance, the feat achieved; but the man of the guild, who has personally experienced and lived through the arduous times of gradual development bows low before the constructional progress which he alone is able to appreciate to the full. Hardly a decade has gone by since one fought a way through clouds and storms with machines then considered very big and up-to-date. Each year since produced better and bigger machines and almost each year brought some new surprise: wireless transmission and reception, giving an entirely new orientation to navigation; instruments for flying blind, realisation of the pilot's dream of sightless flight in fog, clouds and all weathers; the first high-speed planes, which raised from one day to the next the speed limit by 90 m.p.h., thereby changing all preconceived ideas of flying times. And to-day we have the Douglas D.C. — 2, representing air-technically the ideal in comfort, safety and speed.

The Douglas air liner D.C. — 2, of which the "Swissair" has acquired four machines to be used in their services to London, Paris, Berlin and Amsterdam is a twin-engine, all-metal, low-wing, cantilever monoplane, built to accommodate a crew of three and fourteen passengers. The maximum speed is 210 m.p.h., the cruising speed, using engines to 65 p.e. capacity, is 175 m.p.h. Thereby the Douglas surpasses in performance any other make of commercial plane.

Next to greatest attainable safety, the guiding principle in the construction of this machine was the comfort of the passengers. Thus originated a spacious and luxurious cabin, corresponding to the interior of a Pullman car, equipped in a manner to satisfy the highest demands of the most exacting passenger. The cabin measures 26 feet in length, 5½ feet in width and 6 feet in height. The chairs, spaced at 3 ft. 4 inches, are free of all vibration, being mounted on rubber cushions; seats are 19 inches wide and backs are adjustable for reclining or even reversing to face the passenger behind, charming consideration shown by the designer to flying honey-moon couples! The automatically regulated heating system maintains the cabin temperature at 70° F., even should the air outside be as cold as 20° F. below zero. The ventilating system, on the other hand, is capable of reducing the temperature in the cabin to that reigning outside. At the rear of the compartment is a roomy cloakroom, as well as the haunt of the stewardess, the well-stocked Bar, complete with refrigerator, ready to serve all

possible needs of the passengers. Each seat has its own window, ventilation control, bell-push for the stewardess, ash tray, luncheon tray, literature pocket. The well proportioned cardboard basins, capable of accommodating the contents of an ostrich's stomach, are rather an anachronism. They are there, less for practical use, than to remind the traveller that there were times when air travel was not quite so comfortable, yet when one was nevertheless grateful for the glorious experience of a flight in the air.

During the trial flights the perfection of the sound-reducing arrangements made a great impression. Walls and floor of the cabin are sound-insulated by the latest scientific methods, a combination of various layers of different sound-

absorbing materials, whereby a so far unattained perfection in reduction of noise has been achieved. Gone are the days when one had to stuff the ears liberally with cotton wool; conversations can now easily be carried on in normal tone. A contributing cause of air sickness (noise) is thereby eliminated.

The Douglas aeroplanes of the "Swissair" are equipped with twin, 700 horse-power, air-cooled, Wright Cyclone engines, placed below the level of the fuselage, and which have proved their worth for some considerable time. The propellers are Hamilton's three blade standard type, with variable pitch, adjustable whilst in flight; this helps the plane to rise or increase horizontal speed, which in turn relieves the engines. The fact that the Douglas machine retains full manoeuvring capacity, although one motor should be out of action, is of greatest importance. Not only can one motor alone fly the plane at full load for hundreds of miles in normal, horizontal flight, but it can also climb to a height of 10,000 feet. As cruising speed involves the running of the motors at but 65 p.e. capacity, this ensures due care for the engines. 25,400 feet is absolute ceiling at full load for the Douglas plane.

For the construction of fuselage and wings a system was applied representing the final stage of years of study and trials with a great number of experimental planes. The cantilever (strutless) Douglas wing is a beamless multicellular structure with full bearing exterior metal covering, a system which has given excellent results during the last six years. In the Douglas multicellular wings the load is taken simultaneously by a large number of constructional parts and is not concentrated on a few points only. The torsional strength of the Douglas wing is so great that it prevents all wingtip oscillation even at abnormal speeds. Due to the great stability of the multicellular wing, vertical deflection is reduced to a minimum, thereby eliminating the danger of fatigue of materials with its perils. The smooth exterior covering of the multicellular wing is strengthened by a large number of Dural longitudinal profiles and by ribs. The torsion is absorbed by the metallic covering the numerous ribs hold the wing in its shape and subdivide the construction into a large number of stiff, box-like spaces. An examination of the wings' exterior will give full information concerning the state of the entire supporting structure. The life of the wing is almost unlimited owing to the absence of covering fabrics, struts and cables. Apart from extensive trials of a general nature, the twin-engined Douglas underwent no less than 215 single static load tests, about a hundred of which referring to complete parts, such as wings and fuselage and the rest to wing ribs smaller parts, fastenings, etc. Load tests in flight were made in America with the type which preceded the D.C.—2, when actual load conditions under abnormal demands were created. The plane, fully loaded and travelling at maximum speed was repeatedly stalled until 3.25 times normal gravity speed towards earth was reached; the load thereby achieved represented 66 p.e. of the maximum load for which the wing was built and represented the greatest possible demand to be met in practice. An acceleration-meter fixed on the dashboard showed the acceleration achieved. At the centre of gravity another instrument recorded speed and acceleration simultaneously. Cinema cameras registered deflections and deformations of the wings; examination of the photographs proved that in spite of the abnormal load neither permanent deformation nor any sign of weak constructional parts were to be detected.

The centre part of the wing is fitted with a split trailing edge flap, a form of air brake which, hinged down before landing, reduces landing speed to approximately 60 m. per hour and considerably shortens the run-out. When in flight the wheels can be drawn up hydraulically into the frame of the motors, yet so arranged as to protrude sufficiently to make possible an emergency landing while the gear is in that position.

The Douglas D.C.—2 has a length of 62 feet, a span of 85 feet and weighs 8 tons at full load. The two chief- and two auxiliary petrol tanks have a capacity of approximately 420 gallons. The petrol consumption of the two engines together amounts to approximately 72 gallons per hour.

The dimensions of the pilot's compartment are in line with the spacious passenger saloon. This can no more be termed "the cockpit," resembling more an office bristling with all sorts



of instruments. The pilot has lost the opportunity to dress himself up in the old picturesque manner complete with fur lined boots, leather helmet and awe inspiring goggles, ready for the photographer. To-day he would have to pose, equipped with sliderule, compasses and graphic charts so as to produce the proper effect.

The best, the most reliable and the most up-to-date instruments procurable have been installed. The wireless equipment represents the very latest as created by the radio technicians, consisting of a transmitting station, a sound direction finder and, working on ultra short wave lengths, an installation for blind landing. If only a few years back we flew without an aerial, to-day we have not one but three on board.

An absolute novelty is provided by the "Automatic Pilot" which can be put in operation at will. It is intended to relieve the pilot of purely manual tasks and is a great help, particularly during long flights. It enables the pilot to

devote himself more to the task of navigation, whereas in former days the aviator was pilot and navigator at the same time, now the automaton takes over the duties at the helm, leaving the pilot free to study and calculate his course. Air navigation in the abstract and especially navigation by wireless is a science in itself. There are so many little things playing an important rôle, e.g. the fact that the magnetic pole does not coincide with the geographical pole, that the compass meridian deviates from the magnetic meridian; that the incoming radio waves suffer diversion by the metal parts of the plane and which must be allowed for by consultation of special tables. All these points must be carefully taken into consideration when receiving direction signals, before applying these to maps and course. It is also of importance to fly strictly to schedule and at the same time to fly economically.

In our motors, horse-power depends on number of revolutions, wind pressure and height; in addition the difference between outside tempera-

ture and carburettor temperature must be considered. According to force and turbulence of wind and air, the flight basis must be adjusted; information as to horse-power under certain conditions can be obtained from graphical charts. You see, in spite of the automatic pilot, there is no time left for the aviator to play patience. The erstwhile pilots have become captains of air travel, just as the old sailing ships have grown to ocean liners.

May our passengers confidently and on frequent occasions make use of the services we are placing at their disposal, services representing the very best which human ingenuity could provide. May they also not forget all the toil and sacrifices which were necessary before it became possible to board a Douglas machine in Zurich at 9 a.m. and take lunch in London. Perhaps they will then regard with just a little awe and respect this silver-glittering, height and distance devouring creation of human ingenuity.

Morgenflug Ueber die Alpen

By Walter Mittelholzer

Gewaltige Nebelarme halten den Flugplatz umklammert, wie wir in regengrauer Stimmung in Dübendorf starten. Aber gleich reissen sich die zwei Motoren in das quallige graue Wogen hinein, und unsere Maschine zieht uns siegreich in blendendes, warmes Sonnenlicht. Mit leichten Rückenwinden fliegen wir dem ewigkeitsgebauten Alpenwall entgegen und bohren uns immer höher in die blaue Luft über einem ungeheuren weissqualmenden, verballten Nebelmeer. Unabschbar, fast wie eingefroren, gleicht es in seiner Erdenrücktheit einer polaren Landschaft. — Der Duft der Ferne wandelt sich zu durchsichtigen goldenen Schleiern. Von den übersonnenen, schneig glitzernden Alpenmatten des Säntis zu den von Neuschnee bestäubten, firnstarrenden Berner Alpen sehen wir im weiter Runde Bergleib an Bergleib. Die wunderbare Sicht reicht sogar über das zugedekte Mittelland hinweg zu den schwarzen Gratrippen des Jura bis zum gleichfalls schneefreien Feldberg Süddeutschlands. — Nach zwanzig Minuten schweben wir über den sonnseitigen Hängen des Rigi, bald darauf sind wir senkrecht über dem Pilatus-Kulm. Die Gipfelflur der Berner Alpen, diese erhabene Titanenschöpfung der Natur, dehnt auf unsrer Linken immer näher und fesselnder in ewigstarrer Wildheit. Die bolzgeraden Abstürze mit den tief eingeschnittenen Scharten der klotzigen Felsblöcke verschlingen das starke Gehrümm der Motoren. Die hochalpinen Geheimnisse dieser übergewaltigen Natur, die die Bergsteiger so oft nur mit dem Einsatz seines Lebens ergründet, erschliessen sich uns sicher und spielend. Wie von reinem Linnen ausgelegt, blenden an der Jungfrau die breiten Schneefelder zwischen den schwindligen Eiskämmen. Nach einer Stunde überfliegen wir in 3400 Meter Höhe den westlichen Alpenwall über die Gletscher der Diableretsgruppe. Auf den Firnzungen und Schneerinnen zersprüht das Sonnenlicht in einem funkelnden Diamantenregen. Die wuchtigen Eisfälle, Spalten und Schründe ziehen unter uns durch als ein grosses, ehrfurchtgebietendes Mysterium. Die zersägten Schatten unzähliger Eiskerzen malen sich an den seitlichen Moränenwällen.

Zutiefst, am Rhoneknie, bemerken wir klar sichtbar in einem flammigweissen Wolkenrahmen Martigny. In den übrigen Tälern schwingen noch windgetriebene breite Wolkenflächen. Die Natur wächst ins Riesenhafte. Die mühelosen Blicke streifen ihre abenteuerlichen Modellierkünste an den südwardigen Felsgerüsten des Dent du Midi.

Im orgelnden Tonspiel der immerwährenden Luftbewegungen tragen uns nun die starken, schattenwerfenden Schwingen hinüber ins Chamonixtal mit seinen riesigen Eislömen und Gletschern. Mit einmal löst sich aus dem Gewirr

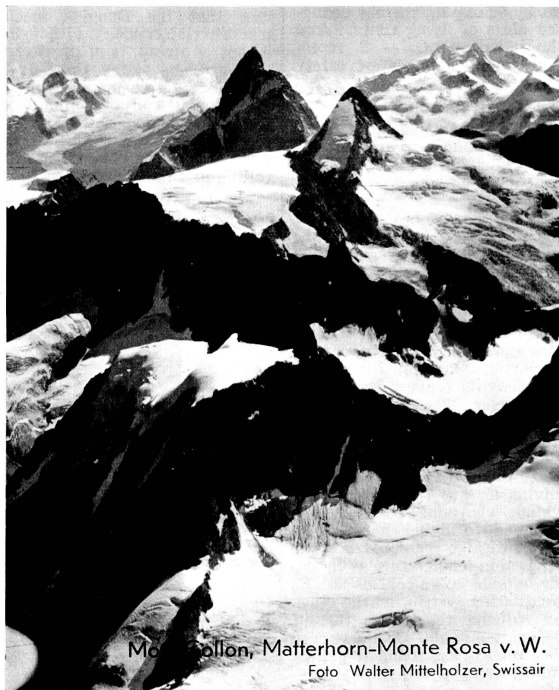


naedelfeiner Spitzen, von Ewigschnee umgürtet, der Mont Blanc. Wir sind dem König der Alpen wie einer alles bezwingenden Offenbarung verfallen.

Oft schon schaukelten mich hier reissende Luftstrudel mit starken Stössen, doch wenn auch der Wind sehr scharf bläst, kommen wir heute in ruhigem Flug dahin, wo sich in stolzem Aufstieg die Felsbastionen türmen und zuzeiten die vernichtenden Lawinen streichen. Die Luft steht klar, spröde und bitterkalt und lässt die sinnver-

wirrenden Szenarien der Gebirgswildnis und ihre Konturen formvollendet erscheinen.

Noch vor wenigen Jahren als die Flugtechnik für unsere jetzigen Begriffe in den Kinderschuhen steckte, wäre ein solcher Flug ohne gründliches Wegweisen und lange Gebirgsferfahrung ausserordentlich gefahrbringend gewesen. Doch heute mit den modernen Luftkreuzern, die mit den raffiniertesten Blindfluggeräten, Selbststeuerinrichtungen und Radioapparaten ausgerüstet sind, wo auch bei einer Motorpanne ein einziger Motor



Monte Collon, Matterhorn-Monte Rosa v. W.
Foto Walter Mittelholzer, Swissair

