

# Dynamic jet age

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## DYNAMIC JET AGE

### Swissair introduces the DC-9

To switch over to a new car takes no longer than half an hour. If one is faced with changing over to an entirely new system, such as from column to stick gear or from ordinary to automatic gear change, it may take a few hours, but all that is needed is a bit of practice and one feels confident and safe in no time.

Matters become more complicated as soon as a large commercial vehicle is involved. When London Transport introduces a new type of bus, considerable planning time is required. Special tooling and equipment like lifting gear have to be produced, and the preparation of maintenance procedures and selection, ordering and arrangement of stocks of replacement parts begins. When the first one or two vehicles are delivered, a programme of driver training and instruction for engineering staff is put in hand. The senior instructional staff at London Transport's training school study the new vehicle and draw up a systematic course of instruction for drivers and driving instructors who then train the actual bus drivers in groups of two and three. The time taken with each man varies from a few hours to a few days. Engineers who have to be able to drive the new bus also undergo training. Mechanical and electrical staff receive instruction. A week or two before a bus is put into service, it goes to the garage from where it will operate. But in spite of all these preliminaries, it is rare for more than two or three weeks to elapse between delivery of a bus and putting it into commercial use.

British Railways have a Driver simulator at Willesden in North London which is the first of its kind in the world. It produces, with amazing realism, all the sights, sounds, movements and even smells of a locomotive cab. And this enables the driver of a new type of engine to get accustomed to the new vehicle in a remarkably short time.

Thinking of a new aircraft, I estimated that it would take a few weeks for pilots and crews to adjust themselves to the new plane. But did I have a surprise when I learned of the complicated process of getting acquainted with a new type of flying machine! Two months exactly is needed between the moment the new DC-9 is delivered and the first commercial flight. Two months! An astonishingly long time, but necessary to train not only pilots, but also cabin crews, technical and ground personnel, a lot of people who must *know* how to handle the new plane.

#### Years of study and development

For 35 years, the American Douglas Aircraft Manufacturing Company has been in business, and in successful enterprise at that. One series followed another, and Swissair have had DC aircraft for more than three decades.

In 1946, plans for a new type of aircraft were made by the Douglas Company, those of the DC-8. The development cost alone of this type surpassed the sum of 200 million dollars. The financial requirements were so high because practically no parts of previous models could be incorporated in the new plane. (The Boeing-707 for instance was developed from a military aircraft, the fuelling plane KC-135). 70 million dollars alone were needed for new tool machines, test stands and assembly halls. The efforts were crowned by a successful maiden flight on 30th May 1958. American aviation companies used this aircraft first in September the following year, and

Swissair's first DC-8 became operational in May 1960 on the New York Route. Today, four of them are used on Swissair's North Atlantic Routes.

#### And now the Short Range Aircraft

In 1957 already, a market survey amongst potential customers for short range aircraft (125-950 miles) was undertaken by the Douglas manufacturers. Based on the requirements stated, plans for the new DC-9 began to take shape. Components and systems which had proved themselves in previous DC series were used as the basis of the new design. One of the major aims was to reduce operating and maintenance costs by simplifying parts, so as to achieve a combination of maximum economy and optimum flight performance.

Construction started in the spring of 1963, and it took some time and careful study and analysis until Swissair were satisfied that the DC-9 was the most adequate aircraft from amongst several comparable types available for its short European lines. Many aspects had to be weighed up, apart from economic considerations and technical durability. Especially with a view to future developments of a two-type jet fleet, it was necessary to ensure that the chosen model would satisfy all Swissair's requirements. And so it came about that the choice was made in favour of the Douglas twin jet.

#### DC-9 Characteristics

When reading about wing span, length and height, it is difficult for a layman, even an extremely air-minded one, to imagine the exact size of the new plane. For the benefit of those readers who are trained in this art, we should just mention that wing span is nearly 90 feet and length just over 104 feet. The tanks are located in the wings and capable of storing 14,000 litres or 3,080 gallons of fuel.

The official description of the DC-9 says that it is a low-wing monoplane with T-shaped tail unit and two tail-mounted Pratt & Whitney JT8D-1 turbo fan engines, each developing a thrust of 14,000 lb.

The undercarriage is made up of two nose and four main wheels, a special construction bearing in mind the high number of take-offs and landings. Of great advantage as a time-saving factor is the high maximum landing weight which is only 10% below take-off weight. No re-fuelling is required after short flights. The Douglas Company have incorporated in the fuselage design of the new plane what was satisfactory in the larger DC-8 machine and have built the new one to satisfy the demand for strength and toughness in a so-called short haul aircraft. The structure is based on the fail-safe principle, and the aircraft should be good for 30,000 flying hours and at least 40,000 touch-downs.

The passengers' comfort has been studied, too, by providing more room than hitherto in the ordinary tourist class. The seventy-five seats are arranged five abreast. The wardrobes and galleys are situated in the front, and two toilets at the back. Another feature which makes boarding and disembarking easier are two self-extending stairs.

As to technical innovations, mention should be made of the interchangeability of the port and starboard engines, a process which can be carried out in as little as an hour.

Here again, the advantages, apart from economy — one engine costs a million Swiss francs — are especially important in a fleet of twelve aircraft.

As regards the flight deck, we have to revert once more to technical language: it is laid out for two-man operation, and each of the two pilots has all the required controls and instruments. Control levers have been arranged so as to reduce manual actions in case of an emergency. We are told that the DC-9 is the only commercial aircraft which has no controls farther away than two feet from either captain or first officer. Navigation equipment, dials and controls for radio and the autopilot are mounted on a console between the pilots and are thus easily accessible from both sides.

Air-cooled multi-disc brakes, fusible plugs in the wheels to prevent tyre bursts on brake overheating, and an anti-skid system are three more characteristics of the new aircraft.

#### From delivery to commercial take-off

Swissair now has twelve DC-9s on order. It is just one of twenty-nine airways companies which have placed orders with Douglas for a total of more than 350 machines. To this must be added about 120 options. There has been some delay in the delivery of the planes, but the first four aircraft ordered by Swissair will be delivered this year, and the DC-9 will become operational for the first time on the route Zurich-Basle-London in August.

The flight simulator ordered in 1964 from Canadian Electronics Ltd. in Montreal, arrived in Zurich early in June. A DC-8F jet freighter transported the seventy-four parts weighing 20 tons direct from Canada to Kloten. This simulator is the first of its type in Europe. It is a digital computer evaluating input data with an even greater accuracy than previous simulation equipment. Its value is about £375,000.

The simulator should be assembled and tested by the beginning of August, and from then to the end of the year, not only over sixty Swissair pilots, but probably also some personnel of other airlines which will be using DC-9's will be trained on the instruction equipment.

When the first of the new machines was delivered in mid-July, Swissair took it over with an acceptance flight on Long Beach near Los Angeles.

The following week has been spent on instructors' flights, and now the plane is being flown by ferry flight via New York to Switzerland where it is expected to arrive on 23rd July. On arrival, it will be weighed, and customs formalities will have to be attended to. Then will come post-delivery modifications; as an instance, the English made seats will be installed.

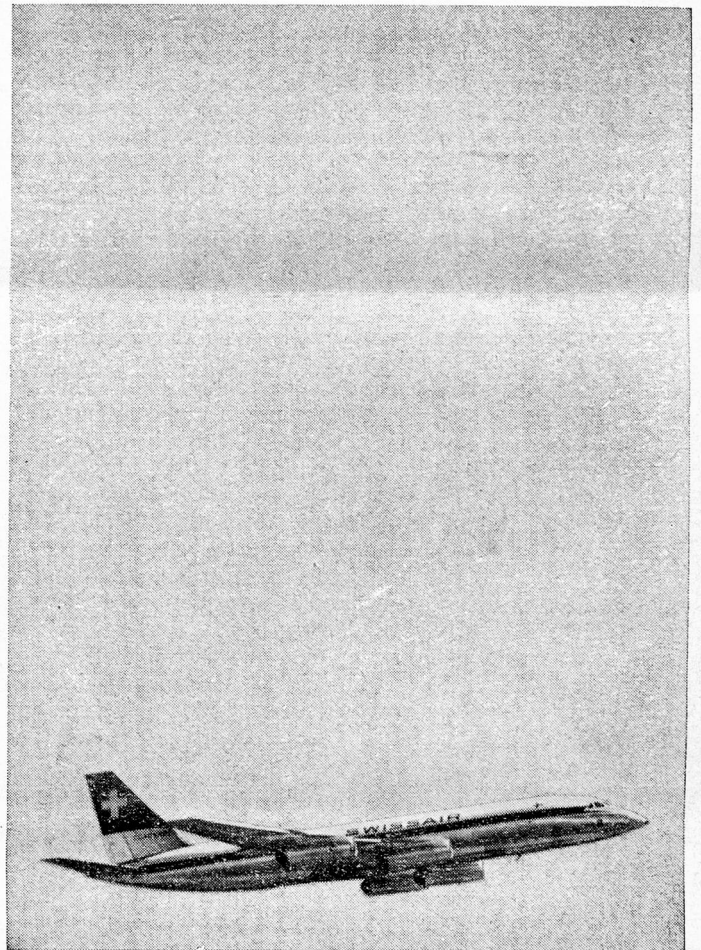
The next stage is the training of the technical and the handling staff, the mechanics and ground crews. Preparations for this were started as early as 1964. The pilots have begun their conversion training.

In Switzerland, the future captain sets out on his training at 17 or 18 with the Aero-Club. Later, in his early twenties, he can enter the Swiss Aviation College (SLS Schweizerische Luftverkehrsschule) whose management has been entrusted to Swissair by the Confederation.

After he has been at the SLS for eighteen months and having received his line pilot's licence, the young man is put on the basic Swissair plane which up to now has been the Convair Metropolitan. He flies as a second co-pilot, and after six months he can start as main co-pilot. After a few years he advances to a "higher" type of aircraft and finally, he becomes a captain.

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On completion of the flight simulator training, the prospective DC-9 captain undertakes a series of practice and training flights in and out of several airports in Switzerland and elsewhere. Among the final touches to the new plane before introducing it into service, is the installation of the galley and the initiation of stewards and hostesses into service on the new type of aircraft.

### Looking ahead

By the end of 1968, Swissair will have changed completely to jet aircraft. Piston-engined planes in passenger service will be discontinued by then, and Swissair will be one of the first European airlines to use jets only. This means great advantages from the point of view of rationalisation and an increase in the airline's competitive strength. By the time the Metropolitans will be sold and the entire European short range network will be served by DC-9's, the seat capacity will be practically doubled.

Swissair also intends — at long sight — to replace its Caravelles by the long-body version of the DC-9 which will have about 100 seats and increased cargo carrying capacity. The eight Coronados, too, will gradually be replaced by additional DC-8's, and this streamlining of the whole air fleet will enable Swissair to keep up with increased competition and to satisfy the growing demand for business and pleasure travel all over the world.

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## SWISS POSTAL, TELEGRAPH AND TELEPHONE SERVICES

(Continued)

"And now a word about the question of financing out of PTT's own resources: Up to now the PTT have been privileged in being able to finance their plant with their own capital — which is small — and substantial outside funds (mostly money from the PTT remittance and banking services). Unfortunately, the flow of these funds is becoming thinner and fails to keep pace with increasing demand. Moreover, the prevailing capital shortage, which will probably continue for some time yet, compels us to have more liquid funds on hand than previously. Several times this year we have had to parry fluctuations in our liquidity reserves in the order of a quarter milliard francs and more. Therefore the time is drawing near when we shall be forced for this reason as well, either to reduce our investments or to apply to the Federal Exchequer for

investment loans, which will surely not be granted without charging of interest.

"All Swiss circles of sound judgment agree that the only way out of this bottleneck is to be found in the adjustment of certain rates and fees. Accordingly, in the message accompanying the budget for 1966, the Federal Council asked for a further **increase of postal rates.**

"All major PTT rates are laid down in the Federal laws concerning the postal traffic and the telephone and telegraph traffic. Consequently, they can only be raised by an act of legislation. This cumbersome procedure is little suited to adjust PTT rates to changing conditions. As our efforts to run the PTT services in accordance with business management principles are increased, the need for a more flexible rate fixing policy is felt more and more. There is hardly a cogent reason why the PTT should not be on an equal footing with the Federal Railways in this respect. Serious thought was therefore given to the problem of linking the rate revision under way at present with a modification in the rate fixing powers, to the effect that the Federal Assembly would have exclusive jurisdiction in the fixing of PTT rates.

"However, this plan was abandoned in consideration of the urgency of the PTT rate revision. For if the two issues had been coupled, the new rates would have become effective at the beginning of 1968 at the earliest. By then considerable PTT deficits would have accumulated. Moreover it should be borne in mind that the Swiss people would show particular distrust to a modification in the rate fixing powers at the precise moment when rate increases are imminent. Therefore, the Federal Council will take up this issue again at a later time when no concrete rate adjusting measures are under consideration.

"Besides, the anticipation of the rate raising bill in the form of an amendment to the Postal Traffic Act will permit us to regulate, in the most appropriate form, the problems of exemption from postage and of liability.

"It is quite clear that the present rate revision cannot be undertaken along the lines of the revision of 1961, when the additional receipts of the postal service were offset by a decrease in the earnings of the telephone service, so that no surplus resulted for the PTT Enterprises as a whole. But at that time, the reserves were still intact and it was still possible to deliver the traditional 70 mio francs to the Federal Exchequer. Today we must face the unpleasant fact that the PTT have become an

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