

FLYING DOWN TO RIO

By J. de CROZE

—modern Version: The Operations
of Brazil's VARIG Airline

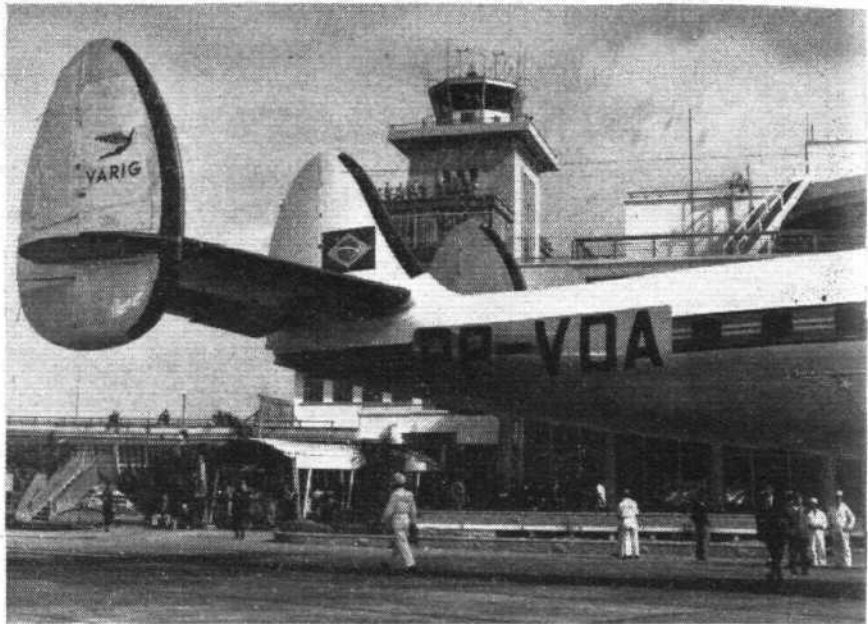
Super Constellation on the VARIG Brazil-U.S. service at
Congonhas Airport, Sao Paulo.

FOR those of us who matured in the cinema hot-houses of the 'thirties, the phrase "flying down to Rio" may conjure up a phantasy of cumulonimbus clouds, gay and fatuous chatter, and magnificently improbable aeroplanes with a passenger list composed simply of Fred Astaire, Ginger Rogers, an eighty-piece orchestra, and a host of chorus girls nonchalantly tap-dancing their way to Brazil on the wings of an unidentifiable aircraft. Again, it may bring to mind those persistent travellers to Rio—the brilliantly blonde Alice Faye, the irrepressible Carmen Miranda with the entire merchandise of a Copacabana fruiterer atop her head, and the dashing "Latin," Cesar Romero.

Alas, the entire population of South America no longer turns out in extravagant costume to greet arrivals at Santo Dumont airport with dances and perpetual *carnaval*. In this more sober era, Brazilians are extremely conscious of the fact that they have inherited a nation to build and that they are in the process of doing it. The catchwords are build and develop—off with the old, on with the new. In such an atmosphere and in a country the size of a continent but devoid of practically any surface transport, either rail or road, the obvious answer to one aspect of the problem has been to use aviation in every possible manner. Not only to bring together the far-flung provinces, but—in the way the wagon-trains had done in the United States and the railways in Argentina in the nineteenth century—to bring population itself and the means of its subsistence to the hitherto uninhabited interior.

Only fifty years ago, with the exception of long-dead gold mining towns and of the dying rubber-boom settlements of the Amazon, there were no settlements of any considerable size away from the coastal fringe. Beyond, for 3,000 miles in a straight line, all was unexplored territory. Today, thanks largely to aviation, new inland cities have already 100,000 inhabitants, like Goiânia, or over 300,000, like Belo Horizonte; and the most remote outpost can be reached from Rio within a day. Most significant in this respect is the creation of the new capital of Brazil, Brasilia, almost in the geographical centre of the country.

The first domestic airline to be opened in Brazil was VARIG



Viação Aérea Rio Grandense). This year it celebrated its 30th birthday, and is thus one of the world's oldest. It was founded in May 1927, in Pôrto Alegre, the capital of the important south Brazilian state of Rio Grande do Sul, an agricultural area of temperate climate and hard-working Germanic and North Italian settlers. There were no airstrips then where landplanes could operate to and from, though, fortunately, there was an immense lagoon, half the size of England, stretching from Pôrto Alegre to Pelotas, the state's second largest town, and to Rio Grande, its main harbour and meat-packing centre. But at that time the Kondor-Syndikat's Dornier Wal seaplane *Atlantico*, was making successful demonstration flights in Brazil; and the nine-passenger, twin-engined aircraft was bought by VARIG and duly registered on page 1 of book 1 of Brazil's virgin Air Register. The Pôrto Alegre to Pelotas flight becoming the first scheduled Brazilian domestic run.

By 1932 VARIG could change over to landplanes—Junkers F.13s, D.H. Dragons, and eventually Ju52s—using fields and other primitive runways to bring the scattered market towns within easy reach of the capital for the first time, and to open areas of the interior where nothing but bullock-carts and canoes had ever been seen before. In that year 1,500 miles of routes were created. Four years later, passenger, mail, and freight traffic had reached sufficient proportions for the Pôrto Alegre to Pelotas run to become



Santos Dumont Airport, Rio de Janeiro. The tall buildings in the foreground occupy the former site of a mountain levelled to supply earth for constructing the airport.



VARIG's Dornier Wal "Atlantico," the first passenger aircraft registered in Brazil (1927).

the first daily flight in Brazil; and the company embarked on an expansion programme that has not slowed down since.

Just preceding and during the war years, VARIG, at its own expense, built and equipped landing-strips, created weather stations and an entire radio and telecommunications network, pioneered flight-safety equipment, and installed night-flying facilities at 19 airports. DC-3s and C-46s were put into service and proved a god-send; night-mail services were inaugurated and the first tourist-class services launched. With typical Southern Brazilian thoroughness and patience, as well as provincial patriotism, the company established a remarkably solid base before venturing outside the limits of its home state. This it did first in 1942, not to other Brazilian states, but to Montevideo, the capital of the neighbouring Republic of Uruguay. Rio was reached only in 1946, and then the other two southern states, Santa Catarina and booming Paraná, were covered with the kind of network VARIG had pioneered in Rio Grande do Sul—a more arduous task since these two states are very mountainous and covered with dense forests and lie within the troubled atmospheric belt between the temperate and sub-tropical zones.

In 1952 VARIG added a 3,500-mile route to Brazil's third main area of population, the coastal cities of the north-east, and in 1954 its second international service (to Buenos Aires). In 1955, a Pôrto Alegre - Rio - New York route, operated with Super-G Constellations, was opened, becoming the company's luxury flag-service incorporating all the trimmings of "gracious living" aloft. Supporting this new effort to realize the fabled sumptuousness of the Astaire-Rogers era is a particularly active public relations drive which sees to such things as the invitation of film stars and international celebrities. VARIG has already a sales and prestige office in Zurich and is about to open another in Tokyo. Next on the agenda are certain complementary domestic routes, including one to Brasilia, and eventually routes to Europe and the Far East.

The progress story on the traffic side is paralleled on the maintenance as well as on the administrative sides. VARIG now has a staff of 3,800. The maintenance base, which has been kept at distant Pôrto Alegre because of its spaciousness and favourable working conditions (unobtainable in either Rio or Sao Paulo), is of high international standard. A side-line is a section where government training and flying-club aircraft, which are used until they literally fall to the ground, are sent from all over Brazil for com-

plete rehabilitation. A unique aviation school—flying and engineering—was added in 1951. On the administrative side, this pioneering company is distinguished by a shareholding structure in which half the total shares are held by an employees' foundation which offers benefits ranging from pensions and medical care to holiday resorts. The remainder of the shares are held 35 per cent by the employees themselves, 10 per cent by private holders, and 5 per cent by the State Government. Shareholders, obviously patriotic, forgo their dividends so that all profits may be ploughed back for development.

VARIG statistics for 1956 were: passengers carried, 511,414 (up 26 per cent over 1955); freight, 17,000,321 ton-km flown (up 15 per cent); km flown, 18,467,982; hours flown, 67,000; extension of lines, 30,024 km; staff, 3,800; fleet, 23 DC-3s, 14 C-46s, five Convair 240s, three Constellation L.1049Gs.

Brazil is now covered by a dense network of internal air routes operated by six major airlines. Passenger services have three classes: first, carried in Convairs or Constellations; tourist, in DC-4s, Scandias, and C-46s; and third in DC-3s, with maximum seating in C-46s. The fare structure, enforced by the Diretoria de Aviação Civil, is related to a basic rate of about 5d a mile, first being set at 5 per cent above basic, tourist at 10 per cent below, and third at 20 per cent below.

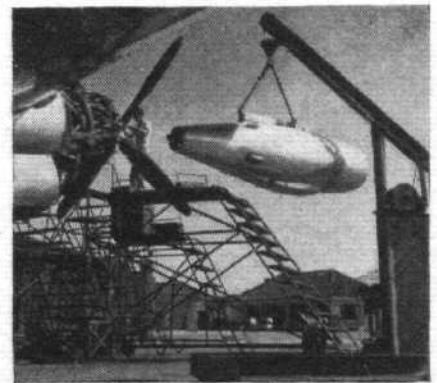
On this network, a dozen trunk routes (short and medium hauls) linking the provincial capitals and chief commercial cities, stand out. The rest of the system, unglamorous but as vital, is the amazing "countryman's" network, interlinking almost every little town, settlement, or outpost on the huge map of Brazil. This sector, on which are flown rather more than half the total number of hours flown in Brazil, and to which the Brazilian airlines bring the technical and financial power earned on the more profitable trunk routes, provides such freight and passenger transport as in most other countries relies on buses, trucks and local trains. It has an unfrivolous *clientèle* of farmers, cattlemen and traders to whom flying, in spite of its relatively high cost, is the only economic manner of transport. Hops are sometimes as short as 50 miles, runways mostly poor, and the latest standards of flying comfort obviously not expected nor required. It is not surprising that these services should be operated almost exclusively by the faithful DC-3s. The directors of VARIG—which has 23 such aircraft—actually plan to use them for another ten years. It is also an ideal area for the retirement from the trunk routes of such aircraft as the C-46.

It is in relation to the domestic trunk route network that the interesting topic of replacement first comes up. This part of the network resembles more the European or North American pattern, with 200- to 900-mile hops between cities of substantial importance. It includes the prize short-haul, Rio - Sao Paulo, which has the world's second highest frequency, with aircraft leaving every 15 minutes in both directions. On its trunk routes, VARIG at present employs Convair 240s, and C-46s fitted with Palas auxiliary jet pods. It is on this sector that VARIG has introduced two novelties to Brazil: the business-man's or after-dark non-stop services between two such distant points as Pôrto Alegre and Rio, and the



(Left) VARIG's home base—Pôrto Alegre, South Brazil.

(Right) A Turboméca Palas A.T.O. jet pod being mounted on a C-46.



Passengers embarking on a Convair 240 "business-man's flight" at a South Brazilian airport.



FLYING DOWN TO RIO . . .

all-cargo services. For the latter, C-46s are also used; but the volume carried is now such that a specialized aircraft might be welcomed. All kind of freight is carried with the exception of livestock, which is handled by special companies. There is no such thing as car-ferries, but the transport of cars is of especial interest—although rates are not cheap: e.g., £60 for a Ford Prefect from Rio to Porto Alegre, a distance of 900 miles. (This, however, must be seen in relation to the roads, which on this route necessitate a week of exhausting driving and result more often than not in damage to a vehicle that may be worth three times or more its European price.)

As far as passenger traffic on these trunk routes is concerned, comfort and speed are requisites; this sector is one on which the appeal of new aircraft cannot be ignored. VARIG had been interested in Viscounts from the start—as a corollary to its interest in the first Comets—and has had a total of eight on order. Owing to the possibility of foreign exchange being made more expensive for this category of imports (Brazilian airlines at present import aircraft at the rate of Cr\$ 45 per dollar, which is only just over half its true value, but may shortly have to pay Cr\$ 85 per dollar) it now looks as if VARIG will have to concentrate its financial efforts on the North American route, where competition is greater, and not take up its option on these Viscounts.

Five 810 series Viscounts are, however, now being bought by VASP (Viação Aérea São Paulo), a slightly smaller airline with no international services with which VARIG has entered a kind of pool arrangement, though not a merger. According to this, routes of both companies (VASP, based in São Paulo, covers that state and the central hinterland) will be operated by the most suitable aircraft of either company. These VASP Viscounts will thus fill the gap over some of VARIG's trunk routes until that company is ready for the next stage for which, most probably, the Caravelle

will be chosen, over-riding an earlier interest in the Electra. The Caravelle made a very successful visit to the VARIG headquarters on its recent South American tour, and the company is now reported to be sending technicians to Toulouse to study equipment.

At present, the runway at Santos Dumont, Rio's city airport for domestic routes, can only cope with DC-3s, Scandias and C-46s; and it is so conveniently situated where the business heart of the city edges on the bay that services operating with larger aircraft, particularly on the short São Paulo route, from Galeão International Airport some ten miles away, are at a disadvantage. It is, however, being lengthened on further reclaimed land to meet the requirements of the immediate future. (The President's Viscount, coming in for a check-up, effected a perfect landing at the airfield in its present state, to many people's surprise.)

Jets are not only favoured by the management for domestic medium-haul routes but even more so for the New York route and for possible new lines to Europe and the Far East. VARIG is now strongly rumoured to be ordering three Boeing 707s—possibly with Rolls-Royce Conway engines—for delivery in late 1959, with which it is hoped to make Rio - New York non-stop *clientèle* on that route, and VARIG is doing all it can to assume a leading position on it. To take care of traffic demands until then, it has ordered two or three more Super-G Constellations (in place of the L.1649As originally selected) while North American carriers are operating with DC-7s, as is Panair on its service to Europe. VARIG is thus not particularly interested in long-range turbo-props, which it feels it could use only as an interim measure. It is perhaps for Class-B long-distance international services run by other Brazilian airlines—and at present operated with Skymasters—that the long-haul turboprops may be considered.

* Since this was written the company have signed a contract for three Boeing 707s. No final decision on engine-type has been made ("Flight", September 20).—Ed.

CALLSIGN JET SPEEDBIRD (continued from page 535)

are the excellent E. K. Cole Search Radar E.120 (the map-painting facility of which is said to be "proving first-class"); the Marconi AD.712 crystal-controlled ADF; the Decca Navigator Mk 8 at high altitudes and high speeds; and the Standard STR-30 B low-range radio altimeter, which is being used for evaluation and low-level checks on the lag and hysteresis errors of the pressure altimeters. In spite of contour effect, the radio altimeter may prove very useful for operation in really low limits, and in this connection the aircraft is equipped with cockpit-coaming-mounted lights to give visual indication of critical and flare-out height.

Long range *en route* navigation still poses many problems (on this series of flights, V.H.F. and H.F. R/T. with its 300 miles plus high-altitude range is being used), but D.I.A.N.—the Decca/Dectra/Doppler combined equipment—is thought to be a promising aid which would give the needed discrete track facility for the climb-out and *en route* phases. The Decca facility would be used for high-altitude stacking in conditions of strong and varying winds.

Although these Comets are not truly representative of the 4s, it is obviously possible to re-appraise the operating techniques that were adopted during the 25,000 hours of operations with the Comet 1. It was found then that flight planning should be done "backwards"—from the weight overhead at the destination with empty tanks, plus reserves (stand-offs, diversions, *en route* performance and navigation deviations) to the weight at take-off. Forward planning, working on the payload and fuel needed, tends to produce economic penalties. For an additional 1,000 kg of fuel, 28 per cent will be burnt "just for the pleasure of carrying it"; if planning is done for a weight greater than the actual take off weight the aircraft will be operated at too low an altitude and more fuel will be used. In spite of this condemnation, the 2Es are operating on a forward-planning technique, because every type of operation is being studied and full tanks out from Beirut is the rule.

Experiments with cruise climb, stepped climb and constant-altitude cruise techniques (where increased consumption is offset against superior T.A.S.) are being made. Looking ahead, a "drift-up" cruise climb along a discrete track and with lateral separation appears to be a better proposition for jet operations than the theoretically equally good stepped climb, since vertical separation as at present employed by A.T.C. may militate against the required height steps being made at the right time—or to the right altitude.

Flight operation on the Beirut and Bilbao runs follows normal Comet practice: 2,000ft before the estimated stabilizing altitude is reached, the temperature deviation and aircraft weight is determined, the chart consulted and the correct altitude for starting the cruise is found. This is usually somewhere between 32,000 and 34,000ft. To operate the two RA.29s in a representative manner, they are throttled to the cruising r.p.m. that will be used on the Comet 4 and the r.p.m. of the inners are then adjusted

to give an indicated Mach number of 0.73 (0.74 corrected). This represents an r.p.m. difference of about 100, with the outers running slightly slower.

It is early yet to judge how the operation is going. So far so good; and there is the ebullient enthusiasm from all concerned that makes molehills out of other people's mountains. A hint of the filter-icing trouble that has been found in R.A.F. Transport Command operations has led to a study of the penalties involved in using filter heat and the effect of unfrozen water in solution being released downstream of the filter. But this is routine development which has been under way for some time, as is fuel water-content analysis, carried out religiously at every refuelling with the Shell water-content detector. Answers are also being sought to the effects (on water content) of adding warm to cold fuel, and the possibility that the tank vents are responsible for condensation within the integral tanks.

One problem there is that is yet unsolved: the cooling blowers for the radio equipment are noisy—just the same annoying fault that troubles Rolls-Royce car owners when their clocks tick too loudly.

ATOMICHRON WITH NAVARHO

THE U.S.A.F. has incorporated the cesium atomic frequency standard called Atomichron (made by the National Company, Inc., Malden, Mass) in the experimental transmitter for the Navarho long-range navigation system. The installation was made on September 5 last year and good results are reported. A frequency standard of the extreme accuracy provided by Atomichron is necessary in order to achieve the 1 per cent accuracy in the distance-measuring element of Navarho. A distance measurement is obtained by phase comparison of two synchronized frequencies, one on the ground and the other in the aircraft. Data is displayed on indicators in the aircraft cockpit.

Atomichron works by monitoring a frequency-producing system to the resonance of the cesium atom and can produce usable signals at 100 kc/s and at 1, 5, 10 and 100 Mc/s with a stability of five parts in 10¹⁰. (Additional details of the working of Atomichron appeared in *Flight* for April 12.)

A further advantage claimed for Atomichron is that, in the high-frequency spectrum, it will permit the use of radio receivers and transmitting equipment with unprecedented narrow bandwidths and precise frequency control. By limiting the spread of radio signals in this way a much greater number of channels can be used in a given frequency band. Present Atomichron equipment measures 84in high by 22in by 18in, and weighs 500 lb. The National Co. estimated some time ago that they could produce an airborne version weighing 60 lb.