La Postale de Nuit

BY HUGH SCANLAN

The author of this article is the only visitor from overseas to have flown with France's night airmail service, and the only journalist, French or foreign, to witness their zero-visibility landing technique. His experience as a supernumary crew-member, he tells us, was "something I shall not forget in a hurry."

Scheduling is deliberately spread between approximately 2000hr and 0400hr in order to achieve the necessary coverage of the country

EVERY night of the working week, one of the most unusual airlines in the world goes into action over Metropolitan France. Few people outside that country seem to know much about her night mail, La Postale de Nuit; very few have ever had the luck to travel on it, yet for all that the service sets an operational standard that has never been approached anywhere else. Its regularity is 99.8 per cent.

La Postale—or, to give its full title, Le Centre d'Exploitation Postal Métropolitain—is a self-contained division of the national carrier, and its sole task is to carry the domestic mail over the length and breadth of the country with as high a regularity index as can humanly be achieved. For this the Centre uses a fleet of 20 aircraft —15 maximized DC-3s and five DC-4s—operating a 1915hr to 0400hr route network radiating from Paris Orly to 16 key towns around the country's perimeter. The crews attend the evening's met briefing purely out of courtesy to the forecaster, because they go anyway—with the result that you can post a letter in the merest Breton village and know for sure that, come fog or tempest, it will get to its destination next morning.

The French have always been rather intense about aviation and mail. Ever since the earliest days they have felt that the one was meant ultimately for the other. St Exupéry described the nation's mail as "the meditations of a people . . . more precious than life"; his successors, proudly following the St Ex tradition, run the operation with ruthless zeal, and talk of it seriously as the incessant struggle of man against the elements.

Last year out of a scheduled total of 11,698 night landings, they diverted only seven by reason of poor visibility. No more than 15 per cent of arrivals were 5min late. Not once during the course of more than 110,000 flights since the CEP set up in 1945 has a take-off ever been cancelled, or even delayed, through weather. In the first nine months of 1964 the fleet shifted 12,770 metric tons of mail, a 16.9 per cent increase over the same period last year and representing some 1,500m letters.

The Postale's network is carefully scheduled to achieve a nation-wide coverage in the narrow time-band allotted by the postal authorities, and arrivals down the seven trunk routes coincide wherever possible to give interline connections. Stopovers rarely exceed 12min, even in the worst winters. To save time the crews concentrate on very precise navigation; specially prepared radio facility charts show direct off-airways tracks, marking suitable towns as visual pinpoints, and ATC can almost always give clearance during these quiet hours so that the schedule may be adhered to with a few minutes in hand.

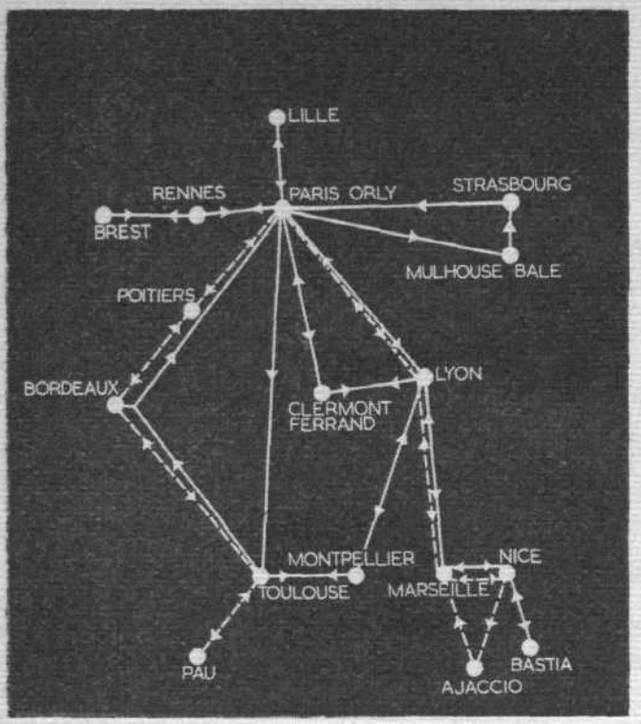
One characteristic of the Postale de Nuit is the very modest utilization, which brings up the interesting question of economics. The legs they fly are short: block times average 71min for the DC-3s and 62min for DC-4s, and the 16 aircraft on the line each night currently total only 14,000 hours' flying per year. Moreover, mail is a fairly low-density cargo and weight limits are very rarely approached, even when the rows of alloy stalls in the unsoundproofed, silver-sprayed holds are crammed to the roof with buff-coloured bags. Weight load factor is 68 per cent.

Yet in spite of all this, and given the postal authorities' fundamental insistence on an overnight delivery, the use of rail transport would be no cheaper—a conclusion based on costs for the DC-3, which CEP find has a c.t.m. figure double that of the DC-4. In any case, they point out, mail trains would be quite impracticable, since they leave the main termini too early and arrive too late. At the present time less than half the 30-centime revenue from an ordinary inland letter is absorbed by air carriage; and when a DC-3 replacement—currently under study—is selected the proportion should be far lower.

To achieve its stipulated degree of regularity, the CEP has evolved a method of all-weather operation that must be unique. The crews, briefly, are encouraged to set their own minima: determination to get the mail through, and the will to land on schedule whatever the conditions, are valued above all else. And, to tackle the kind of limits for which full Autoland is still being developed in Britain, they use no more than our minimum airways package—duplicated VHF, VOR, ILS, ADF and markers. The only unusual equipment is a radio altimeter, though the DC-4s have just been fitted with flight directors.

Three-man operation is unvarying, the members of each crew staying together for purposes of continuity; and since they frequently switch from DC-3s to DC-4s according to the programme the radio and panel layouts of the two types have been brought closely into line.

Landing procedure is rigidly adhered to in fair weather and foul, and each sequence is considered as a group training exercise. Fundamentally, it is built around a visually interpreted ILS approach, flown with great precision down to a pre-arranged break-off height that represents the very limits of human and system capability. The usual drill is for the captain to handle the ILS, while the first officer checks times over the marker and establishes visual reference. The engineer in the jump seat—his



La Postale's network (DC-3 routes, solid lines; DC-4, dotted)

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permanent station—jerks gear, works the settings, and calls out heights from the radio altimeter at 10ft intervals. The discipline of applying this drill unceasingly down to 40 or 30 feet, even on gin-clear summer nights, must be very trying; but they stick to it, and the result is that the members of a team come almost to read one another's thoughts. There is very little chat, and nobody ever raises his voice.

When fog blankets the runway and RVRs fall off towards zero, it is entirely up to the crew whether or not they attempt a landing. They are authorized at all times to go in and have a look, whatever ATC may have to say; and if they damage the aircraft no blame attaches provided they have done their best.

The method of determining visibility is to fly what is known as a *présentation*—a level run at final approach speed and constant power exactly 100ft above the runway. If the crew see nothing they try again at 70ft. From this altitude in a bad fog the faint loom of the approach lighting will almost certainly be visible; but the landing is undertaken only if the members are unanimous in their positive identification of the lights, and particularly of the greens at the runway threshold. For this reason a third *présentation* at 50ft may be necessary.

The aim at the split second when visual reference is established is to handle the aircraft as little as possible. With the DC-3, rotation at this very delicate point has evidently never presented any particular problem, possibly owing to its low inertia; but when the first DC-4 was acquired, in 1962, extensive landing trials were undertaken to determine those flap settings at which the attitude change for touchdown is least. At the special setting arrived at, 25°, pitch-up into the three-point attitude represents no more than two bar-thicknesses on the artificial horizon.

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The demonstration I was given of this devastating procedure was classical. We left Le Bourget (this was before the base was moved to Orly on October 4) at 2315hr in a DC-4 operating Postale flight AF 1021 to Nice, with scheduled traffic stops at Lyons and Marseille. It was a beautiful night, without a breath of wind; but as we rumbled south on the first leg Lyons was steadily fogging itself in, and presently the tower announced an actual of 300m with 200ft vertical, deteriorating fast. By the time we were overhead Lyons Ville, a faintly pale patch in the white blanket far below, a north-bound Postale DC-3 trying to get in for the second time reported that visibility was now down to 100m and still falling.

The captain decreed that we should start the ball rolling with a *présentation* at 100ft. In front of us the DC-3 had turned round in 8min flat and was taxying out again for Paris, reporting barely 80 metres' visibility in the process. But still, commented ATC hopefully, it might perhaps stir the fog up for us a bit. . . . As the first tentacles of the odious white stuff started flickering over the windshield the radio altimeter steadied on 500ft and the next second we were completely immersed.

With the loss of precious height, the tint of the opaque wall changed from the colour of the night to a dirty, baleful yellow. But the voices intoning power commands and altimeter readings remained as impassive as ever—". . . cent pieds . . . quatre-vingt-dix . . . quatre-vingt pieds . . . soixante-quinxe . . . soixante-dix . . ." Then something dim flicked by under the port wing, the captain chimed in evenly with "Remettez les gaz," and we overshot with a roar. All the while I stood gripping the back of the engineer's jump seat, and gazing fearfully forward at the sightless windshield.

A brief conference followed. The first officer thought he had identified a threshold light, but only through coming right down to 70ft. This was a prime example of crew sympathy: they had planned a *présentation* at 100ft, but when nobody spotted anything from that height no word was necessary to agree a change of plan. The captain had perceived one sodium, but decided we were too high to initiate an attitude change. The engineer had seen nothing at all, but his voice showed no trace of sharpening with anxiety as the aircraft sank below the predetermined height. He knew very well what the captain had in mind.

High-speed mail handling has been perfected by the Post Office ground teams

For our next approach a *présentation* at 50ft was decided upon. Having determined the conditions to his satisfaction the captain handed the ILS, plus power and flap setting commands, to the first officer and took over the contact flying. (This was the way in which self-confidence and determination are developed among La Postale's junior crew-members.) The tens of feet reeled off and the atmosphere of studious concentration deepened. . . . Suddenly, at a sounding of 50ft, a flaring sodium rocketed by, much brighter this time, and instantly the four throttles were being eased forward again. Analysis of this second approach revealed that we were several feet to the left of the localizer and too high—"Mal axé" was the crisp verdict. This puzzled me, for the needle was dead vertical the whole way in and we had crossed the marker at precisely the right height. Nobody saw the threshold lights this time.

It was obvious now that visibility had dropped right off to around 50m/50ft, so for our third try the captain re-arranged the workload. The first officer was to look after ILS only, while the skipper monitored the display, called the orders and watched for the lights.

I shall never forget what followed. Listening to the altitude sinking to 20ft with no variation in a blank opaqueness that one could almost touch, imagining the parallax errors of the rose-tinted instruments trapped inside a wall of yellow-white, was a

horrible experience. Off came the power, and the enormous brute began floating blindly. Then there was a gentle squeak, the watery flare of sodiums swimming by each side with agonizing infrequency, and I knew that, somehow, we were down. I collapsed gasping on the floor; the captain calmly began to lecture his crew on the approaches and draw conclusions.

We were lucky on this occasion to be able to taxi in, with brakes groaning like old-fashioned bulb horns and the captain sticking his head out, coughing, through the clear-vision panel. Sometimes visibility is so thick that intersections vanish and it becomes impossible to turn off the runway; the crew then have to brake straight ahead, cut their engines, and wait patiently for the jeep with the lit *suivez moi* sign to locate them and lead them in.

The last time this happened the jeep got lost, a search party in the shape of the flight engineer was despatched from the aircraft (one of the DC-3s) and the two blundered about trying to find each other for three-quarters of an hour. One night last winter the base of the fog layer at one of the stops was just 6ft above the concrete. The airport vehicles were crawling about slowly, but the crew of the DC-4 that had just landed were completely blind at a height of 15ft and could not even see to taxi. So the Post Office vans were driven on to the runway, the brown sacks were piled aboard, and the aircraft took off downwind on the ILS localizer.

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At Lyons the crew were jubilant about the pea-souper they had found for me. They had been rather blue at the start of the trip on account of the clear starlit night, but the thicker it got the more cheerful they became.

"The great thing about fog," remarked the captain, during the 12min shower of bulging mail bags through both ends of the aeroplane simultaneously, "is that once you've tried it even marginally better visibility seems quite easy. And landing is a lot easier than taxying—there's no quick flick of lights to guide you then." Another captain, with only two years' command time, commented on his first fog landing in almost exactly the same terms: "I had never tried it before in earnest, and neither had the other two in my crew. But we just pressed on, following the drill we had been taught and had practised in good visibility over and over again, and everything went fine. After our *baptême du brouillard* the next one was a piece of cake, and we felt we'd been doing it all our lives."

Later, back at base, I discussed the whole concept with La Postale's chief pilot. Were they not really pushing the readability—and, for that matter, the reliability—of a purely approach aid too far? I asked. Even the finest cross-pointers were quite thick, and ILS beams had been known to bend. Wasn't it all, in fact, very dangerous?

"Not a bit" was his reply. "You must remember that in this sort of fog there is no wind component in any direction you can measure. So you don't have to worry about drift correction during the final stages. The approach path itself is completely defined, because you cross the marker—which is 1,000 metres from the threshold—at an altitude of 180 feet at a closely monitored rate of descent." There was no question of taking risks for fun, he said; they merely anticipated automatic landing methods with desperately classical procedures, training, character-building and more training. "You saw for yourself how straightforward it all is," he added.

Yet even in fog, full ILS is something of a luxury for the Postale de Nuit. By September this year only eight of the 16 stops had been equipped with it; five still have only localizers, and here the crews time the glide for themselves with a stopwatch. There remain three points with no aid other than CR/DF.

It has consequently become a tradition of the CEP, ever since they started the night mail service in 1945 with French-built Junkers Ju-52s, to tackle fog landings using no more than the simple "gonio." The procedure relies on the special left-hand high-intensity approach lighting pioneered by the Postale (centre-line lights would be invisible over the nose) and the alignment of the DF aerial with the runway axis.

After homing overhead, the crew fly exceedingly accurately timed downwind and base legs at an unvarying IAS with exact Rate I turns, allowing themselves a sufficiently long final approach to set up good co-ordination with the controller. It is then entirely up to them, from this dead reckoning position, to establish a rate of descent that will put the aircraft over the threshold lights at the right height for a *présentation*. This, remember, in thick fog at night, though there are three in the crew working as a team with stopwatch and radio altimeter and the tower to give them intermittent steers. They were anxious to show me the technique, but I said no.

A scheduled Postale run in winter to Lille not so long ago, before that airport received ILS, was a typical case. Met announced that conditions were quite impossible—less than 40m in fog, and ground traffic was crawling. Nevertheless, the mail had to go. What was the point of aeroplanes unless one achieved an overnight delivery with them? Feeling its way down through a freezing, blank wall of vapour, the DC-3 missed at the first *présentation* and overshot; but the second attempt was more successful.

Transmissions and answering QDMs shot back and forth faster and faster as they rumbled in, the wretched controller sweating over his tube and microphone until he hummed like a transponder; the

By 0400hr every morning the fleet is down and switched off, its task completed

Not only economic, but docile: La Postale's DC-3s have been put down in literally zero conditions

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engineer, chanting the heights with one eye on the radio altimeter, yet managing to squint down over the absorbed captain's left shoulder and interjecting "Bien, bien, très bien, ne corrigez plus" as halo after luminous halo drifted wetly under the wing. The first officer flew the aircraft while the captain, stopwatch and throttles in hand, peered ahead. Suddenly a dim green light whipped beneath them; back came the power and the next second the tyres were humming over the asphalt. The controller was assisted out of his chair in a state of collapse, and the aircraft, raising flap, edged in to one side of the flarepath to identify the turn-off point.

Lille has a number of circular dispersal pans at various points, a relic of the German occupation. These are called *marguerites* by the French, because from the air they look like flowers, with five or six pans branching from the stem of the taxyway. The DC-3 missed the runway intersection and rolled very carefully into the first round pan of a *marguerite;* with squealing brakes it taxied all the way round its perimeter, then into the next pan and all the way round that; finally, after negotiating the fourth dead end the captain gave it up in disgust and switched off. He needn't have worried, though; the Post Office vans did not make the airport until 2hr later.

One might justifiably conclude that this ruthless single-mindedness has a somewhat depressing effect on the CEP's safety record. Yet in fact their accident rate compares favourably with that of scheduled passenger carriers operating to minima ten times and more as high. There was a fatal accident involving one of the original Junkers 52s in 1948, followed by the loss of a DC-3 in 1953; since then rather more than 90,000 landings have been achieved without any injury. By comparison, the number of landings per fatal accident for United Kingdom scheduled passenger operations during the ten-year period 1954-63 was 177,222.

Expensive Occasions

Naturally, the Postale crews have their little incidents. In 1962 a DC-3 captain felt a faint shock from the rear of the aeroplane and found he had killed a cow. Last year—an unusually eventful one—a DC-4 hit one of the airport buildings while doing a *présentation* in fog at Lyons and returned sadly to Le Bourget; a little later, at the same stop and under the same conditions, a captain wiped his undercarriage off against a hill and force-landed brilliantly in a field. In each case a stand-by aircraft was on the scene within 2hr.

What is so significant is that the CEP crews are not old sweats who give up their whole careers to the mail, but mostly comparatively junior Air France personnel on a two-year assignment. The captain I flew with, for example, was shortly due for a posting to command on Caravelles, while the first officer had only recently joined from the Air Force and thought he might carry on to Viscounts.

Morale is exceedingly high, and the work itself cherishes a unique atmosphere not found in passenger operations. "There's a pattern in our lives," commented one pilot. "We all meet every duty evening, we're all in constant touch—unlike the long-haul boys, who hardly see each other and may not revisit a stop for months." Flying a high-frequency, short network, they also regularly meet the air traffic controllers all round France and recognize each voice over the air. ATC understand the Postale's tasks better than anyone. Recently the CEP crews threw a tremendous party for all the controllers that could be got together in Paris, during which mutual problems and new ideas were sorted out over glasses of wine.

The staff of La Postale lead a distinctly vivid life, and they obviously get the greatest personal satisfaction from their minima-whittling—exactly like a golfer reducing his handicap. During the winter of 1952-53 solid fog clamped the entire northern half of the country for 40 consecutive days. Everything else with fixed or rotating wings was pitilessly grounded; but not the mail. They have put down with the help of lightning flashes, despite burnt-out electrical systems, holes punched in control surfaces by driving hail, and lumbered with ice. "After a landing like that," remarked one captain, "we wouldn't change places with anybody on Earth. Discussing it all afterwards over a glass of wine feels like a million francs, and just as rewarding."

Adventures are to the adventurous. One night a USAF C-82 was wandering around south of Paris, trapped above 8/8 cloud with its radio systems dead. The crew were thinking about baling out, when a southbound Postale DC-3 found them, tucked them in tight behind one wing-tip and led them safely back to Le Bourget.

Birds aren't supposed to be airborne at night, but one captain recently collected a bird which shot through the windshield as he was bending forward to adjust a gyro. Less than three weeks later he collided with another, which struck him below the jaw as he reached up to switch on a booster pump. His colleagues presented him with a game licence. Shortly after this, when everybody was feeling birdstrike-conscious, a co-pilot pointed to a large patch of blood on the windscreen during an approach. "Look!" he exclaimed in alarm. "No feathers!" Grunted the captain, with a glance at the altimeter, "Rabbit."

There's a Moral . . .

Last winter, one of the fleet's DC-3s left in foul weather with a priest as passenger. Freezing fog was forecast at the destination; but as they flew the sky cleared, the moon rose and they touched down eventually under a canopy of stars.

A little later, the same crew left in ideal conditions with a couple of newspapermen; but along the route a fearful storm blew up, the pouring cloudbase sank to less than 200ft, and just as the aircraft bucketed over the runway threshold in gale-force winds, a power cut killed the flarepath. Quick as a flash, however, the captain banged on his landing lights and just tickled her down on to the concrete in one piece. A while later he carried a journalist, who chattered excitedly for 2hr into a tape recorder; then they were struck by lightning, and the tape was wiped clean of every word.

Occasionally one of the mailplanes is met by a posse of police as it rolls majestically in under the floodlights, and the crew learn that they have been carrying a couple of million francs in notes. Dedicated normally only to letters, they have loaded emergency cases, blood plasma and drugs. Last casualty was a burns victim, whisked 150 miles to specialist treatment in a Toulouse hospital when ambulances were crawling on the fog-choked roads. No other aircraft were flying that night in the whole of France.

The Centre d'Exploitation Postal was something new in my experience. The way they get their results may seem drastically Gallic; but it is sheer, solid professionalism, and devotion too.

FORTHCOMING EVENTS

Dec 17	*RAeS Gloucester and Cheltenham Branch: "Hydrofoils," by C. Hook.*
Dec 17	*RAeS Isle of Wight Branch: Branch prize lectures.*
Dec 17	*RAeS Yeovil Branch: "Accident Investigation," by E. Newton.*
Dec 18	*RAeS Weybridge Branch: Annual dance.*
Dec 22	*RAeS Hatfield Branch: "Navigation for Military Purposes," by Wg Cdr Grocott.*
Dec 23	*Kronfeld Club: Christmas party.*
Jan 4	*RAeS and IMechE: Joint meeting, "The Bristol 188," by M. Liner.*
Jan 5	*Society of Environmental Engineers Midland Branch: "Environmental Testing of Blue Steel," by C. A. Mitton.*
Jan 5	*British Interplanetary Society: All-day symposium, "The Engineering of Scientific Satellites."*
Jan 5	*Aviation Forum: "Air Transport's Built-in Headwinds —Too Little Personal Attention?" By John and Patricia Stroud.*
Jan 5	*RAeS London Airport Branch: Air-freight symposium.*