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## Number 82 November 1972 DEPARTMENT OF CIVIL AVIATION AUSTRALIA



**COVER:** An old bird comes home to roost. At Melbourne's Moorabbin Airport, VH-ANH, one of the "character" DC3's of the Australian airline scene since World War II, is "greased on" for the last time, ready for honourable retirement to the Moorabbin Air Museum. In the left hand seat for this final nostalgic flight is another "old campaigner" of Australia's airways, Captain Peter Gibbes, Operations Manager for Ansett Airlines, who has the unique distinction of having flown every Douglas DC series aircraft from the DC2 to the DC10.

Originally a wartime C-50, VH-ANH was converted to DC3 specification, in Australian National Airway's Essendon workshop early in 1946. During its lifetime, it has logged over 45,000 hours and flown almost 6,000,000 miles.

**ABOVE:** VH-ANH enjoying the acclaim of visitors to the Museum's aircraft park.

**REAR COVER:** "Australian Aviation At Work" can fairly be said to be the "theme" of the Digest's cover pictures. And so it remains this time, albeit somewhat closer to home than usual! To mark the occasion of the Digest's international recognition (see page 18) we take the liberty of depicting something of our own "behind the scenes" activity, and on this issue's back cover Assistant Editor Dick Maclean, and Peter Mooney (Layout and Production) refuel the Department's Cessna 170 during a recent "editorial" trip. The veteran but highly versatile tail-wheel Cessna is used frequently for research and photographic travel flights necessary in the preparation of the Digest.

- D.C.A. Photographs by T. Martin.

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Aviation Safety Digest is prepared in the Air Safety Investigation Branch and published by the Department of Civil Aviation at two monthly intervals. It is distributed free of charge to Australian licence holders (except student pilots), registered air-craft owners and certain other persons and organisations having a vested operational interest in Australian civil aviation. Aviation Safety Digest is also available on subscription from the Australian Government Publishing Service as shown on the order form below. Contributions for publication should be addressed to The Editor, Aviation Safety Digest, Bay 18300 GP 0. Methourne 3001 Box 1839Q, G.P.O. Melbourne, 3001.

Change of address: Readers on the Department's free distribution list should notify their nearest Regional Office, Sub-scribers should notify the Australian Government Publishing Service.

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Editor: G. Macarthur Job. Assistant Editor: R. J. Maclean. Design: N. Wintrip and P. Mooney. Printed by The Ruskin Press Pty. Ltd., 39 Leveson Street, North Melbourne,

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(Please use block letters)



JANDAKOT

LANCELIN

GERALDTON

ONSLOW



Left: Weather satellite photograph showing cloud associated with active cold front, lying over south-western portion of Western Australia

Inset: The inverted main wreckage of the Comanche, lying where it fell amongst the low scrub.

The owner-pilot of this Comanche had recently fitted an ADF to his aircraft and, though he had no formal training in instrument flying, was inclined to regard himself as an instrument pilot. Despite a forecast cold front lying across his intended route, with thunderstorms, severe turbulence and extensive cloud development, the pilot planned a "VFR" flight from Jandakot to Onslow via the Lancelin and Geraldton NDBs.

After the aircraft had reported normally at Lancelin half an hour after departing, nothing more was heard of it and search and rescue action was begun. Later that day a search aircraft sighted the Comanche's widely scattered wreckage 80 miles north of Lancelin. It was evident that the aircraft had broken up in flight. Severe thunderstorms with very heavy rain had been experienced in the area at about the time of the accident.

HE pilot of the Comanche held a private licence and had been flying for about nine years. During this time he had accumulated nearly 900 hours. About half of this had been gained on his own PA-24-250, which he used on business throughout Western Australia.

The Comanche had crashed in undeveloped, low-lying limestone country, covered with low scrub. The unburnt main wreckage, consisting of the fuselage with the engine and the stubs of both wings still attached, but minus the tail cone and empennage, was located four miles inland from the coast, which at this point almost corresponds with the direct Lancelin-Geraldton track. The main wreckage had struck the ground inverted in a flat attitude while descending almost vertically. Damage to the propeller blades and spinner indicated that the engine was running and developing some power at the time of impact.

The impact had been severe enough to break up the engine itself and some of the cylinder heads had been wrenched from their barrels. The stubs of both wings were approximately symmetrical, the failure in each case having occurred just outboard of the undercarriage wheel wells. The undercarriage itself was still in the retracted position. From the main impact site, a trail of wreckage extended some 6,000 feet in a south-easterly direction. Altogether, eighteen separate portions of the aircraft's structure were located along this wreckage trail. These comprised the outer sections of both stubs of the stabilator still attached, the fin and rudder, and various smaller portions of wreckage associated with these failures.

Examination of the main wreckage and reconstruction of the likely trajectories of the various components found along the wreckage trail, indicated that the aircraft had broken up in flight at an altitude of about 5,000 feet while heading in a south-easterly direction. Examination of the wreckage components themselves revealed that the structural failures had resulted from aerodynamic loads in excess of the airframe's ultimate design strength.

Both wings had failed in upward bending outboard from the fuel tank bays. The starboard wing had folded up and back across the fuselage, striking the fin as well as the starboard stabilator, breaking off both these tail components. The port stabilator was also struck by a separated part of the wing structure, but subsequently failed in downward bending as a result of aerodynamic loads. The tail

damaged by impact, but examination showed that it was probably tuned to the Geraldton NDB at the time of the crash.

There were no witnesses to the accident itself, but from meteorological information available to the investigation, as well as from evidence provided by other pilots who were flying that morning, and by witnesses living in settlements on the coast not far from the site of the accident, it was possible to obtain a fairly accurate picture of the weather conditions that affected the area on the morning of the accident.

An active cold front, produced by a low pressure system centred off the coast to the west of Perth, was moving across the west coast of Western Australia, introducing a cold, unstable air mass. At about the time of the accident, layers of stratiform and convective cloud, interspersed with active thunderstorm cells, covered the area from 20 miles north of Lancelin to Dongara, 35 nautical miles north of the accident site. The base of the cloud was frequently obscured by heavy rain, while the cloud tops, rising to a general level of 15,000 feet, concealed more isolated but higher cumulo-nimbus cloud development. Moderate turbulence was present at all levels, but would have increased in intensity in the convective cloud and in the vicinity of the thunderstorm cells. At about 0945 hours on the morning of the accident, the settlement of Sandy Bay, only four miles from the site of the crash, was inundated by torrential rain falling from an active thunderstorm cell. The area forecasts covering the route north from Perth on the morning of the accident, predicted intensive frontal activity with layers of stratiform and convective cloud and isolated thunderstorms, and were consistent with the actual weather conditions recorded in the area.

Although severe turbulence existed in the area of the aircraft's flight planned route north of Lancelin, it was considered unlikely that the gusts generated by this turbulence would have been, of themcone, complete with the remaining selves, of sufficient severity to cause the sections of the stabilator, had then catastrophic structural failures suffered separated from the fuselage. It was by the aircraft, provided of course that evident that both wings had failed almost the aircraft was being operated within its simultaneously and the other structural normal flight envelope. Rather some failures probably occurred within a very additional factor or factors, such as short space of time. There was no excessive airspeed or abrupt control evidence in the wreckage of any fire, inputs, would have been required, in lightning strike, explosion or aero- combination with the turbulence, to dynamic flutter, nor anything to indicate produce the aerodynamic loading that the aircraft and its systems were necessary to cause the structural failure. other than fully serviceable when the It is also unlikely that the turbulence in wings, the outer sections of both in-flight failure occurred. The aircraft's the vicinity of cloud formations would stabilators, the fuselage tail cone with the ADF and its controls were severely have been so extreme that the pilot, while



Left: The main wreckage after it had been turned upright during the investigation. The RAAF helicopter in the background was employed to locate other sections of the aircraft scattered along the wreckage trail.

Below: Location of accident site three miles east of Lancelin-Geraldton flight planned track.

flying visually, would have been unable to maintain control of the aircraft.

It was learnt during the investigation that the pilot, though not trained or qualified in instrument flying, had several times in the past continued into weather worse than the minima specified for Visual Meteorological Conditions. On two occasions several months before the accident, while flying up the coast of Western Australia with passengers, the pilot had persisted with the flight in deteriorating weather well below VMC. On both these occasions he had flown at extremely low altitudes in an attempt to remain below a progressively lowering cloud base and maintain visual reference with the ground, and had only discontinued this course of action when, despite the extremely low height to which he had descended, visual reference with the ground was eventually lost. The pilot had been visibly upset by these experiences, but it is apparent that his fears lay more with the danger of flying into obstructing terrain because he was unable to fix his position, than with doubts as to his capability to control the aircraft by reference to instruments.

There was also evidence that, after having the ADF fitted to his aircraft only a short time before the accident, the pilot had again encountered adverse weather while flying north of Jandakot. This time however, instead of following his former procedure of descending and navigating visually at low altitude by following the coast, the pilot had climbed through the cloud, navigating by his newly-acquired ADF. The cloud he encountered on that





occasion was probably stratiform type 20 miles north of Lancelin but when the acquired some capacity to control the associated with the stable air mass lying over Western Australia at the time, and would have contained little turbulence.

It seems likely that the pilot, having thus gained some confidence in his ability to fly and navigate by reference to instruments, assumed he would be able to follow the same procedure on the day of the accident. The area forecasts covering the coastal route on the day of the accident, described the existing conditions accurately and, as the pilot used some of this information when compiling his flight plan, he would have known that Visual Meteorological Conditions were unlikely over his proposed route. As well as this, a commercial pilot whom the pilot knew well, had suggested to him in the Jandakot briefing room that morning that the weather "wasn't particularly suitable for VFR". Nevertheless, the pilot submitted a VFR flight plan for the coastal route via Lancelin and Geraldton and nominated these two locations, each of which has an NDB, as reporting points. The cruising levels specified in his flight plan were certainly above the forecast stratiform cloud tops, but it seems that he disregarded the other forecast conditions associated with the severe frontal weather.

After reporting his position normally at Lancelin, the pilot advised Perth Flight Service that he would be cruising at 6,500 feet instead of 8,500 feet as planned, because of cloud, which the pilot could no doubt see ahead. It is known that the heavy convective cloud and thunderstorm activity began about the course of his flying career, had with severe frontal weather.

But by persisting with the flight in such conditions, it was surely only a matter of time before the aircraft became caught, not only in these heavy cloud formations, but also in the severe convective turbulence that existed within them. In these circumstances, it is not hard to turbulence encountered by the aircraft been disorientation, loss of control of the aircraft and, almost inevitably, a high speed spiral dive. The nature of the structural failure suggests that, while the aircraft was diving at high speed, perhaps in excess of its Vne, and the pilot was attempting to recover by pulling back hard on the control column, there was an encounter with severe turbulence. All three of these factors would have had to be present to some degree to produce the type of structural failures sustained by the aircraft.

The tail cone of the Comanche, with the stubs of the stabilator still attached, as it was found along the wreckage trail.

accident occurred the aircraft had pene- aircraft by reference to instruments, this trated this area by a further 60 miles. In had clearly not been done on an official the conditions that existed in the area at basis and was probably without the time, it is most unlikely that this foundation in sound and systematic segment of flight could have been flown instrument flying instruction. In these strictly in accordance with the visual circumstances it is unlikely that he would flight rules. Nevertheless it might have have been capable of sustaining control been possible, at least for a time, for the for any length of time under Instrument pilot to have retained some limited and Meteorological Conditions, especially if probably desultory visual reference that some degree of turbulence was present. It was sufficient to enable him to maintain is also apparent that the pilot had little control of the aircraft and, at the same knowledge or understanding of the time, avoid the heaviest cloud formations. hazards posed by severe frontal weather, even to IFR equipped aircraft flown by competent instrument pilots!

There is an old saying that "fools rush in where angels fear to tread". In the distressing circumstances of a fatal accident, of course it seems unfair and envisage the extent of the cloud and the certainly unkind, to criticise a pilot for errors of judgement that might have becoming simply too much for the pilot's contributed to that accident; after all it is ability. The result would no doubt have easy to be wise after the event. But pointing the finger of blame is furthest from the intention of the Digest, and the circumstances of accidents like this one are discussed in detail only to try and help other pilots to learn from these unhappy experiences so that they might avoid similar pitfalls. In this case, there is no doubt that the accident could have been avoided if the requirements for the conduct of VFR flight had been observed. It is thus impossible to avoid the conclusion that the accident resulted from the pilot's decision to continue the flight into what were clearly Instrument Although it is evident that the pilot, in Meteorological Conditions associated

## **FATAL OVERSHOOT**

CAUSE:— The cause of the accident was that the pilot, not having adequately assessed the physical characteristics of the strip, then did not take proper action to achieve optimum landing performance of the aircraft.

■ N Sydney some weeks before this L accident, the pilot of the Comanche 260 and four friends had decided to make a holiday flight around Australia. Plans and preparations for the trip were carefully made and on the appointed day the pilot with one of the passengers departed for Adelaide in the aircraft, where the other three passengers joined them. The trip, which was intended to last 17 days, ranged as far as Perth in the west and Darwin in the north, then continued to the north-east coast of Queensland via Mt. Isa. Early in the afternoon of what had been planned as the second last day of the trip, the party arrived at Starcke Station, 40 miles north

friends. After dinner at the homestead that night, sitting on the lawn in the cool of the evening, the pilot had a long talk with a flying instructor friend and appeared to be well satisfied with all aspects of his around Australia flight. At the conclusion of the discussion, he mentioned that they were flying again in the morning and retired to bed early.

After breakfast the next morning, the pilot refuelled the Comanche from drums and shortly after 1030 hours the party departed for Townsville. An uneventful flight lasting some two and a half hours followed and, after landing and taxi-ing to the dispersal area, the pilot again saw

of the party hired a taxi to take them all into town where they had lunch at a cafe.

Returning to the aerodrome later in the afternoon, the pilot went to the briefing office where he obtained a comprehensive briefing of the frequencies and clearances required for the next stage of the flight to Tierawoomba Station. The property is situated on the western slopes of the Great Dividing Range, some 40 miles south of Mackay, and the party had planned to spend their final overnight stop there before returning to Sydney.

Approaching Mackay at 1635 hours, the pilot passed a position report giving an ETA for his destination of 1652 hours,



of Cooktown to stay overnight with to the refuelling while the other members but 15 miles further on, as the township of Sarina was about to pass under the nose, the pilot noticed that the aircraft was approaching a layer of cloud. The cloud was slightly below their own level, and extended south and west, obscuring the tops of the Range. The pilot had planned to continue down the coast to Koumala before crossing the range on a south-westerly heading to Tierawoomba homestead. By the time the aircraft had reached Koumala however, the pilot saw that the cloud layer would prevent them from crossing the range at this point. He therefore decided to turn back to Sarina where it was still clear, cross the range west of Sarina and approach Tierawoomba homestead from the north.

> By this late stage of the trip, the novelty of flying had worn off for the passengers and they had been passing the time dozing of simply admiring the coastal scenery. Now however, as their destination approached, the passengers became more alert and when the pilot sighted a homestead which he thought might be Tierawoomba, all on board began scanning the area for the airstrip which had been described to the pilot. When it was evident that the homestead was not Tierawoomba the pilot continued west until he obtained a positive fix over the township of Nebo. He then took up a new heading for Tierawoomba. It was by now 1730 hours and the pilot told the passengers that if they were unable to find their destination within the next few minutes they would return to Nebo and land at the aerodrome there.

> A few minutes later, the pilot sighted the homestead and airstrip and circled twice while he inspected it from the air. The time was now close to last light and, with the overcast cloud obscuring the dying rays of the sun, light conditions were poor. The strip ran east-west and noticing from a windmill close to the strip that the wind was almost calm, the pilot decided to land into the west. After approaching over the trees growing close to the eastern end of the strip, the aircraft appeared to float for some distance and finally touched down more than half way down the strip. To the passengers, the landing at first appeared normal but suddenly the pilot stood hard on the brakes and the aircraft swung to the left. His action was too late and the aircraft, still rolling fast, ran off the end of the strip, plunged into a deep erosion gully and impacted violently against its far wall. The pilot was killed, two of the passengers received serious injuries and the other two escaped with minor injuries.

\* \* \*

The airstrip at Tierawoomba is adjacent to the homestead and is aligned almost due east-west. It measures 2480 feet from end is bounded by an erosion gully 30 feet deep, which is clearly visible from the air but not from the strip itself. At the eastern end, trees on the approach path reduce the effective operational length of the strip to only 1260 feet.

aircraft's arrival, watched the landing from near the homestead at the eastern end of the strip. They said afterwards that the aircraft appeared to approach too high and too fast and that it did not touch down until two-thirds of the way down the strip. One of them commented that, before the aircraft actually landed, he thought the pilot was having a close now too late for him to divert to another look at the strip. Dusk was beginning at aerodrome before darkness fell comthe time.

The passengers in the aircraft said that the approach seemed normal, but they felt that the aircraft "floated" for quite down was made about two-thirds of the approach gradient over the trees at the accident.

It could not be positively established have been prudent of the pilot to have why the pilot waited so long after touching down to apply the brakes, but a nique. end to end and is grass covered with a number of factors which could have reasonably smooth surface. The western contributed to the accident were investi- the opposite seems to be true and this, gated.

On the day of the accident, the aircraft had arrived at Townsville at about mid-day but did not depart again until 1520 hours, finally arriving at the homestead some two hours and 25 Two witnesses, who were awaiting the minutes later, only 22 minutes before the official time of last light. But, because of the overcast conditions at Tierawoomba, the actual time of last light would probably have been advanced some 10 to 15 minutes. It seems quite likely therefore that, having at last found his destination, the pilot would have felt some urgency about landing, as it was pletely. It was not possible to determine from the passengers whether or not the pilot actually saw the gully while making his aerial inspection before landing, but some distance before actually touching even in the fading light, it is hard to down. From the evidence available, the imagine that such a prominent feature investigation concluded that the touch- could go un-noticed. However, apart from the fact that the gully is virtually invisible way along the strip at a position from low on final approach and from the consistent with a standard one in twenty strip itself, no reason could be found to explain why the pilot did not apply the eastern end. It was calculated that, had brakes earlier. One possibility is that he the pilot used maximum braking even may have obtained the impression that from this point, he would still have been the strip was far longer than it actually able to bring the aircraft to a stop within was. When approaching to land in this the confines of the strip. But this was not direction, the strip appears to continue to done, and the aircraft ran to within 150 a far line of trees in the distance, giving feet of the gully before the pilot braked the impression that there is ample length savagely and apparently attempted to available for landing, despite the obstructturn away to the left. At this late stage ing trees on the approach path. Neverthehowever, it was impossible to avoid the less, landing as he was on an unfamiliar

adopted a precautionary landing tech-

From the evidence however, rather together with the fact that the pilot did not commence braking until the aircraft had used almost the entire length of the strip, strongly indicates that he made a grave error of judgement. The evidence is insufficient to determine the reason for this error of judgement but the possibility of accidents arising from misjudgements of this sort can obviously be safeguarded by adopting the correct type of approach when landing on unfamiliar areas. To achieve the optimum landing distance, the aircraft's landing weight should be calculated and the appropriate approach speed extracted from the landing weight chart in the aircraft's flight manual. Immediately after touchdown, maximum braking should be applied, to bring the aircraft to a stop with the shortest possible ground run. Using this procedure, and flying the aircraft accurately, the optimum landing performance will be obtained. Had the pilot planned his landing at Tierawoomba in this way the accident could have been avoided.

It had been the pilot's intention to land at this property even before departing from Sydney and he had telephoned the owner, who was a relative of his to obtain information about the strip. The owner was unable to tell him the strip's exact dimensions, but said that similar aircraft to the one he was flying used it often and that, if the strip was unserviceable for any reason when the aircraft's visit was imminent, he would inform the Department of Civil Aviation at Mackay Airport. country strip for the first time, it would During the discussion however, the owner



The airstrip at Tierawoomba, as seen on final approach into the west. Note how the erosion gully immediately beyond the far end of the strip is indistinguishable from the surrounding terrain.

The wreckage of the Comanche, lying in the erosion gully, as seen from the western end of



western end of the strip, nor of the fact not possible. Had he realised this, and that almost all aircraft landing at the property made a practice of approaching from the west. After this discussion with his relative, the pilot made no further the aircraft. enquiries about the condition of the airstrip at Tierawoomba.

the strip.

Although the pilot obviously gave the planning of this stage of the flight a considerable amount of thought, his that the pilot's normally capable handling attitude still left a good deal to be of the aircraft, was affected by the accident. Needless because the accident desired. No fuel was available at Tiera- situation in which he found himself. As was still avoidable even when the aircraft woomba and it is clear that the pilot had planned to take on sufficient fuel at Townsville for the flight to the station property, and on to Rockhampton the have induced him to make an approach because the safety equipment in the next day. Having made a number of which was too fast in the circumstances. aircraft was not used. But the accident weight and balance calculations earlier in the trip, he knew that, by uplifting the fuel required for these two stages, the aircraft would be above its maximum take-off weight on departure from Townsville. Whether or not he also realised that the fuel consumption during the flight would be insufficient to reduce the aircraft's weight below the maximum for landing, cannot be known, but calculations made during the investigation showed that at this stage, the aircraft was still 160 pounds overweight. This excess landing weight would have added approximately 100 feet to the landing run. Although 100 feet does not sound excessive, the mere fact that the aircraft was overloaded might well have influenced the pilot to make his final approach at a slightly higher than normal speed, as indicated by the witness evidence. Proper flight planning would have shown the pilot that operating the aircraft in an overloaded condition was had they been wearing their harnesses, consolation to realise that this accident is

Ouite apart from the aircraft's actual landing performance at the weight to which it was loaded at the time of the landing at Tierawoomba, it is possible

made no mention of the gully at the the operation as he had planned it was survived, and the front seat passenger would have sustained far less injury than arranged beforehand for fuel to be he did. The utter simplicity of the reason available at the property, the flight could for this omission makes the outcome of have been completed without overloading the accident all the more distressing. The pilot's shoulder harness was jamming only because it had rewound itself slightly off-centre. To remedy the problem, the harness had only to be drawn out and fed back into the rollers symmetrically.

This was a needless and most tragic already mentioned, it was close to dark, finally settled onto the ground. Tragic in and his anxiety to place the aircraft on that, even after the accident itself was the ground as soon as possible could well unavoidable, the pilot's life was lost only Although not directly related to the began long before the aircraft began its cause of the accident itself, there is one final approach to land; it began when the more point relevant to its tragic outcome, pilot did not find out more detailed which must be mentioned. In preparation information about the strip; when he did for the around-Australia trip, the pilot not plan this stage of the flight had three point harnesses fitted to the adequately by arranging for fuel supplies front seats of the aircraft, but neither to be available; when he realised the front seat occupant was wearing the aircraft would be overloaded but shoulder portion of his harness at the accepted the fact - in short when he did time of the accident. It was learned that not follow procedures which have been soon after the trip began, the recoiling formulated by long and costly mechanism of the pilot's shoulder harness experience. What has been said might had jammed and he subsequently did not seem unduly harsh on this unfortunate use it throughout the remainder of the pilot. After all, the errors and omissions trip. It is not known why the front seat that have been discussed are no greater passenger did not have the sash of his than most of us have made at one time or harness fastened at the time of the another. It could undoubtedly be said accident, but he was probably following that he was very unlucky all things the pilot's example. The pilot was killed, considered. But the fact remains that it is and the front seat passenger received scrupulous attention to these things, serious head and chest injuries, because which take only a little extra time and neither of them had their shoulder care that are the mark of the truly harnesses fastened. It is very likely that, professional pilot. It is perhaps some not the solution to the problem, and that correctly adjusted, the pilot would have an object lesson on their real worth.

# NOSAR, NO DEALS

A short time after they had attended an aircraft auction at Whittlesea, Victoria, two private pilots, one of whom owned a Cessna 172 based at a private airstrip near Geelong, began planning a visit to Wagga, N.S.W. for a similar function. Although the owner was going to the auction primarily to buy parts for his Cessna, the trip was also to serve as a navigational exercise for the other pilot. Most of this pilot's recent experience had been confined to local flying in the Melbourne area.

BOUT two weeks before the auction, and a few minutes afterwards was noticed compiled a preliminary flight plan cloud, towards Port Phillip Heads. showing an initial track to Rosebud on Port Phillip Bay, thence to Mansfield, possible after first light.

daily weather report on television. The relative to telephone Wagga Airport. She on the ranges and gale force winds about and the Distress Phase was declared. parts of the coast. Commenting to his of the Great Dividing Range.

completely overcast with stratus and was hampered by lack of any definite strato-cumulus cloud with a light information on the aircraft's movements. northerly breeze but it was not raining So far as was known, the private flight and the navigator-pilot remarked to his was to be conducted VFR and, at that wife that conditions "weren't too bad". time, there was no requirement for the He then left for the aerodrome to meet submission of a flight plan to cover this the owner-pilot and his wife, together class of operation. A close check of all with a third private pilot who was also ATC units in the Melbourne area going on the trip to further his produced no evidence of a plan having experience. About half an hour later the been lodged, and further checks disclosed Cessna was seen taking off into the north that no Departmental unit had received

A the pilot who was to act as navigator flying eastwards beneath the overcast \* \* \*

Towards evening the following day, the Albury and Wagga. As a further exercise, navigator-pilot's wife became concerned he then applied a wind typical of the when her husband had not arrived home. conditions prevailing at that time of the She expected that the Cessna would have year, to the tracks and distances he had returned as planned some time after measured, and calculated approximate midday, and when she had heard nothing time intervals for the various stages of the more by 1900 hours, she telephoned the flight, together with corresponding fuel police. Subsequent enquiries disclosed consumptions. Retaining a copy of this that because of bad weather at Wagga no flight plan in order to discuss it with the aircraft had departed from there that day. owner of the Cessna, the navigator-pilot This set her mind at rest for a time, but left another copy with his wife. He she remained puzzled that her husband explained that they expected to be back had not telephoned to tell her of the on the day following the auction and that delay. At 1000 hours the next morning they hoped to leave Wagga as soon as she rang the aerodrome where the Cessna was normally hangared, but the aircraft At his home during the evening before had not returned. An hour later, when the flight, the navigator-pilot watched the she still had heard nothing, she asked a forecast for the next day predicted an then learned that there was no record of overcast sky with rain and showers in the the Cessna having arrived at Wagga. The southern and mountain districts of circumstances of the flight were reported Victoria. There would also be snowfalls to the Department's Search Controller

The weather throughout the remainder wife on the possibility of snow, the of the day on which the aircraft was navigator-pilot said that it might be reported missing proved impossible for an necessary for them to take an alternative aerial search but the next morning, the route to Wagga, tracking further to the fourth day after the aircraft had departed west than planned around the higher areas for Wagga and, as it happened, the first day of winter, an intensive search was Early next morning the sky was begun. From the start, the search effort The wreckage of the Cessna as it came to rest amongst heavy timber, facing down the slope of the mountainside



the aircraft's most probable route, as search was reluctantly suspended. indicated by the practice flight plan left with the navigator-pilot's wife, were also without result.

the aircraft's movements, it was necessary continued searching "unofficially" for entire length of the most likely route to weather permitted, concentrating their Wagga, although the main effort was activities in what was considered the most concentrated on the coast and the high likely area, the mountainous country to ground of the Great Dividing Range. the north-east of Mansfield and beyond However, even from the very beginning of into the higher ridges of the Great the search, snow was already lying on the Divising Range. But the rapidly increasing higher peaks of the range and over the snow coverage and constantly worsening days that followed, consistently bad weather made flying amid the forbidding weather accompanying the onset of peaks and precipitous gorges of this wild a half miles north-east of Mt. Buller. The

any radio calls from the aircraft on the winter continually frustrated the search and remote area of Victoria ever more day of the flight. Although a VHF effort. Nevertheless, areas up to 30 miles Survival Beacon was known to be on in width from the aircraft's probable board, no distress signals had been track were covered and a total of 189 reported. A continuous listening watch sighting and hearing reports were investiwas nevertheless opened on the gated. But not the slightest trace of the appropriate frequency. Checks of all missing Cessna could be found and, seven aerodromes and refuelling agents along and a half days after it had begun, the

search, a few private pilots, on their own In view of the uncertainty surrounding initiative and using their own aircraft,



demanding and eventually, in the face of these formidable difficulties, these efforts had to be abandoned.

The winter snows persisted on the higher peaks until after the end of spring but, with the coming of summer, when the snow had almost cleared, a further search of the higher terrain was planned, Despite the suspension of the official with a Departmental aircraft. But only four days before this was scheduled to begin, the owner of a Cessna 180, who lived in the same area as the owner-pilot to extend the search along almost the several more week-ends whenever the of the 172 and had known him personally, obtained a briefing to conduct a private search in his own aircraft. For two days, this pilot searched the most probable area without result but, late in the morning of the third day, after he had flown almost 20 hours, he sighted the wreckage of the missing Cessna in wooded, mountainous country three and

wreckage was lying at an elevation of 4,400 feet, well above the snow line at the time of the aircraft's disappearance \* \* \*

Examination of the wreckage at the accident site disclosed that the aircraft while on a southerly heading, had crashed down the slope of a mountainside, killing all on board. The initial impact had been with the top of a tall tree, which had torn the starboard outer wing bodily from the structure. The aircraft had then descended steeply down the slope, colliding with other trees and slewing to the right as it went, until it struck the ground heavily some 220 feet beyond the first tree. The wreckage finally came to a violent stop against the base of a tree stump. It was evident that the aircraft was under control at the time of the initial impact.

All major airframe components were accounted for at the wreckage site and inspection revealed no damage other than that which could be attributed to impact forces. Damage to the propellor was consistent with the engine operating at very low or idle power when the aircraft struck the ground but it was evident from a later, detailed examination of the engine, that no mechanical malfunction had occurred which could have contributed to the accident. A quantity of fuel still remained in the tanks and it was evident that the engine had not failed from fuel starvation. At the moment of impact, the throttle was almost closed. the ignition switch was on "both" and the carburettor air control was in the cold position.

It was clear from the investigation that weather forecast for the flight.

The area forecasts covering the most probable route to Wagga at the time of the flight predicted three-eighths of stratus cloud with a base of 1,200 feet ranges which could be expected to clear and tops of 3,000 feet, five-eighths of strato-cumulus cloud with a base of 3,000 feet and tops of 5,000 feet and an unbroken overcast of alto-stratus cloud with a base of 10,000 feet and tops reaching 20,000 feet. Cumulus build-ups with bases of 2,500 feet and tops of 12,000 feet were expected within the Although this form showed the same that, on flights he had made in the past, layered cloud. Rain showers and drizzle were also predicted, with heavy local falls. Moderate turbulence was forecast, expecially near the ranges, and the freezing level was expected to be 5,000 feet, with the possibility of moderate when the owner had examined the progress of the flight. clear ice.

A subsequent analysis by the Bureau of



from other pilots operating in the navigator-pilot had also prepared this Melbourne area or also attempting to second plan, and had begun to keep a log reach Wagga, confirmed that operation in of the flight's progress. It was readily visual meteorological conditions over apparent however, that many of the much of the route, and especially in the errors in track and distance measurement mountainous areas, would have been contained in the practice plan had simply virtually impossible. Although the evidence of witnesses near the aircraft's departure aerodrome indicated that better conditions existed south of the had calculated the wind strength and ranges very early in the morning, the direction. But in using the figures he had weather was deteriorating, with increasing obtained to determine the estimated time cloud down to ground level in the higher terrain of the Dividing Range. The wind, at all levels up to 10,000 feet, was the aircraft's TAS in the reverse sense. At blowing from the north-west at 30 knots. The general weather situation over south-eastern Australia on the day of the calculations were in error, probably flight was highly unusual in that a decided to continue the flight either low-pressure system off the coast of tracking visually, or using the aircraft's neither the aircraft's owner, or anyone Victoria had moved through Bass Strait in ADF as a homing aid. From this point he acting on his behalf, had obtained a a westerly direction, producing conditions which were exactly the reverse of the flight's progress, for there were no those normally found on and south of the further entries on the flight plan form ranges at that time of the year. Thus, after the estimated time interval to instead of poor conditions south of the Mansfield. to the north, conditions south of the occupying the left hand seat, was 36 ranges improved as the depression moved westward, and deterioration began over Licence. He had accumulated a total of the mountains.

flight plan was found in the wreckage. route to Wagga as the one given in the the owner was in the habit of submitting practice plan made out by the navigator- a flight plan only when he was required pilot and discussed with the owner before by regulations to do so, although on some the flight, it differed in some detail from of the longer trips he had made he had this earlier exercise. It was learned that, kept a navigation log to check the original plan, he saw that it contained It was also learnt that, despite the fact several errors in calculation and had that he held no instrument rating and Meteorology of the weather likely to have remarked that it would have to be "done indeed, had received no formal instru-

flight to Wagga, backed up by reports on the two forms indicated that the been carried over to the later version.

It was also evident that, during the first short leg to Rosebud, the navigator-pilot interval for the next stage to Mansfield, he had inadvertently applied the wind to this point, it is likely that the ownerpilot, realising that the flight plan apparently made only mental checks of

The owner of the aircraft, who was years old and held an Unrestricted Private over 940 flying hours, of which 780 had been flown in the Cessna 172 type. He Portion of a partly completed domestic did not hold an instrument rating of any class. There was some evidence to show

been encountered by the aircraft on its again". Comparison of the hand-writing ment flying training at any time, the

Left: Map of area in which Cessna disappeared. showing proposed flight path and accident site, 20 miles east of Mansfield.

Right: A close-up of the wreckage lying in dense undergrowth, taken shortly after the investigation team reached the site.

owner-pilot had sometimes flown in instrument meteorological conditions. On one occasion, with another pilot on board the aircraft, he had climbed through a layer of stratus cloud "to get on top" and apparently had no hesitation in flying through "a bit of rough stuff, if it was thin." The owner-pilot had studied several books dealing with instrument flying techniques and had practised them frequently in his own aircraft, tuning the ADF to the local radio station, and keeping his head down to simulate instrument conditions. He had remarked that he believed he could safely fly on instruments for about half an hour, if ever he was caught in cloud. It thus seems likely that the owner-pilot would not have been easily deterred by marginal weather conditions.

The weather conditions actually encountered by the aircraft at the various stages of its flight north from the Melbourne area to the scene of the accident cannot of course be known for certain. Nevertheless, it is possible to make a reasonably accurate estimate of what these conditions were from the weather that was known to exist at various points along the aircraft's route on the day of the accident.

Initially at least, there can be little doubt that the aircraft was flying in VMC. Visual flight was probably still possible as it approached the more southerly ridges of the Great Dividing Range, although there would have been progressively less ground reference available to the pilot as the aircraft continued northwards. At this stage, the aircraft's ADF was probably tuned to the heading, was probably under control at Mansfield NDB and from sighting and low power and speed at the time of the hearing reports in the vicinity of accident but its initial impact with the



The wreckage examination indicated that the aircraft, flying on a southerly Mansfield, it seems likely that the aircraft trees had been made in a moderately



nose-up attitude while banked some 40 degrees to starboard. It therefore seems likely that while letting down, probably in an attempt to regain visual reference after he had turned back, the pilot sighted the trees at the last moment and made an unsuccessful attempt to avoid them. Why the pilot would have chosen to let down where he did into a particularly high and rugged section of the mountain range can only be a matter even intermittent flight in VMC was no for conjecture, but it is possible that, longer possible. If the aircraft then broke with no navigation log to assist him, he cloud long enough for the pilot to obtain made insufficient allowance for the any assessment of the weather ahead, it is strong easterly drift and thought he was a good deal further west where the terrain

Whatever the particular circumstances this occasion the cloud build-up was that led to the aircraft's collision with the developing from the west. If this was so, trees, the fact of the matter is that the it would have tended to mask the accident occurred because the pilot aircraft's easterly drift which would have persisted with the flight into conditions been about 17 degrees, especially as a in which visual reference could not be navigational log was no longer being maintained. There can be no doubt that maintained. Probably concerned with he would have had ample opportunity to the onset of airframe icing, and no doubt see that conditions were deteriorating and having to use the carburettor heat control to abandon the flight well before the frequently to clear the carburettor ice, aircraft reached that area in which the

There can also be no doubt that the attempting to keep a mental note of the pilot knew something of the accidents which in the past have overtaken other pilots untrained in instrument flying, who ventured into Instrument Meteorological Conditions. Yet he believed that he was capable of continuing the flight in these conditions. The outcome of this further attempt to do so should be a convincing demonstration of the fact that merely an inflated opinion of one's own ability, and the belief engendered by the opinion that "it won't happen to me" is no proof against an accident, if one is not properly qualified for that class of operation. The lesson to be learnt from this accident

should need no further emphasis.

# WHAT MORE CAN WE SAY?

W ITH one exception, every Aviation Safety Digest produced in the past two years, this one included, has dealt at length with the unhappy results of attempted visual operations in "Below VMC" weather. The one exception is more than offset by the fact that last year's March issue was given wholly to a detailed study of accidents in this category. In addition, nearly all these issues have included editorial and technical comment on the attitudes of mind and the operational circumstances that combine to produce accidents of this type. In this two year period, 17 accidents of this type have been studied in the Digest. All but three of these were fatal and, in total, they cost a staggering 52 lives.

Eight years ago, a similar "Below VMC" accident trend, though on a much smaller scale, developed during the winter months of 1964. Some very forceful Departmental publicity followed, including a personal letter to all general aviation pilots from the Director-General, as well as a detailed analysis of each of the accidents in the Aviation Safety Digest. It was subsequently most encouraging to find that, despite the steady growth in general aviation activity that followed this time, there was only one further fatal accident of this type in Australia for almost five years. Unfortunately as it turned out, this proved to be only the calm before the storm, for in the latter part of 1969 and throughout 1970, there was a veritable spate of accidents, most of them fatal, in the same category. It was these that prompted the very emphatic treatment of the subject in our March issue last year.

To judge from our 1964 experience and what followed, it seemed reasonable to suppose that this further publicity in the Digest might prove similarly efficacious in averting future potential accidents of this type. Regrettably, the issues that have followed tell quite a different story and any such pious hopes have been well and truly shattered. Now, having examined all these further accidents at length, and having considered and discussed in depth the reactions and motives that combined to bring them about, we must confess to having almost scraped the bottom of the safety education barrel on the subject. So what more can we say about this seemingly elementary problem which yet continues to be responsible for such a high proportion of our general aviation fatalities? Much of the trouble associated with unforeseen disasters of this type seems to be that their symptoms are so very subtle; Flying is such an enjoyable and effortless way of getting from A to B; To a qualified pilot, even if not greatly experienced, a modern, comfortable and speedy light aeroplane is so easy and satisfying to handle; On the other hand, it can be so very frustrating when unexpected cloud or poor visibility dictates that this desirable means of transport should be turned back and landed at some "alternate" aerodrome to wait hours, or even overnight, for some improvement in the weather. Indeed, it is the very performance of our machine itself, that makes it all the more frustrating, for we know that we could be through that "little area of dirty weather" in only a few minutes. And our aircraft seems so safe, solid and reliable – surely it is worth "giving it a go". After all, we can still turn back if we find the going too tough, so where's the problem?

The whole trouble with this reasoning is that, by the time the pilot has learnt to his horror that there is indeed a problem, it is already too late — more often than not the aeroplane is completely out of control in a screaming spiral dive! It's not good enough to say "it won't happen to me!" Pilots who are not instrument trained but who insist on pressing their luck in marginal weather, even "cautiously", will sooner or later find this out for themselves. And what of those pilots who have the ability to fly on instruments, but who yet, in their own wisdom, choose to compromise the very terrain clearance standards that hard-won experience has consistently shown to be vital to safe flight in Instrument Meteorological Conditions? when *their* moment of truth comes, they probably won't have enough time to reason why!

Sceptical readers need not take our word for these claims — intelligent study of all material referred to will establish the facts clearly enough. Perhaps the greatest tragedy of it all is that some of the victims caught in these situations are not the swashbuckling, press-on-regardless, accident-going-somewhere-to-happen types we might expect. They are quite often ordinary, normally careful and responsible private pilots, who simply don't recognise their limitations.

All that needs to be said about the mechanics of these accidents has been repeated ad nauseam in the Digest over the past two years. We make no apology for having continued to cover this subject — the need for repetition is not of our making and, in fact, we would like to be able to devote space to other air safety problems. We therefore earnestly suggest that you re-read what has been said on the subject in the Digest over the past two years — it could literally mean the difference between life and death — YOURS! Adapted from Advisory Circular issued by Federal Aviation Agency, United States.



-S. J. Cherz photograph

## HELICOPTER SAFETY

**D**EOPLE have been injured, some fatally, in helicopter accidents which would not have occurred had they been informed of the proper method of boarding or deplaning. A properly briefed passenger should never be endangered by a spinning tail rotor, yet some have lost their lives because they were not told the proper way to approach or depart from the aircraft.

The simplest method of avoiding accidents of this sort is to have the rotors stopped before passengers are boarded or allowed to depart. But because this action is not always practicable, and to realize the vast and unique capabilities of the helicopter, it is often necessary to take on passengers or to deplane them while the engine and rotors are at, or close to operational settings. If accidents are to be avoided therefore it is essential that all persons associated with helicopter operations, including passengers, be made aware of hazards, and are instructed as to how they can be avoided.

All persons directly involved with emplaning or deplaning passengers, aircraft servicing, rigging or hooking up of external loads, etc., should be instructed as to their duties. It would be difficult if not impossible to cover each and every type of operation or non-flight crew training matter related to helicopters. A few of the more obvious and common are described as follows:-



Approach or leave machine in a crouching manner for extra clearance from main rotor.

> Keep helipad clear of loose articles water bags, groundsheets, empty cans, etc.

Approach or leave on the down slope side to avoid main rotor.

After hooking up cargo sling, move forward and to side to signal pilot.

Approach or leave in pilot's field of vision to avoid tail rotor.

> When directing machine for landing, stand with back to wind with arms outstretched towards landing pad.

Carry tools horizontally, below waist level, never upright or over shoulder.

> If leaving machine at the hover, get out and off in one smooth, unhurried motion

Hold on to safety helmet when approaching or leaving machine, unless chin straps are used.

> Do not touch bubble or any moving parts.

Fasten seat belt on entering helicopter and leave it buckled until pilot signals to get out.

> landing instructions that require no acknowledgement, as pilot will have both hands busy.

(with acknowledgement to "Rotornews", Helicopter Association of America).

Ramp attendants and aircraft servicing personnel.

These personnel should be instructed as to their specific duties, and the proper method of fulfilling them. In addition, the ramp attendant should be taught to:

- Keep passengers and unauthorized persons out of the helicopter landing and take-off area.
- Brief passengers on the best way to approach and board a helicopter with its rotors turning.

### External load riggers.

Rigger training is possibly one of the most difficult and continually changing problems of the helicopter external load operator. A poorly rigged cargo net, light standard, or load pallet could result in a serious and costly accident. It is

imperative that all riggers be thoroughly trained to meet the needs of each individual external load operation. Since rigging requirements may vary several times in a single day, proper training is of the utmost importance to safe operations.

External load hook-up men.

• Know the lifting capabilities of the helicopters involved. Since some operators have models of helicopters that have almost identical physical characteristics but with different lifting capabilities, this knowledge is essential. For example, a hook-up man may be working with a turbo-supercharged helicopter on a high altitude project and without any warning a nonsupercharged helicopter, which looks exactly the same to the ground crew,



comes to a hover to pick up a load. It does not take a vivid imagination to see what could happen if the hook-up man connects a load far too heavy for the non-supercharged helicopter to lift.

• Know the pilots. The safest plan would be to standardise all pilots on the manner in which sling loads are to be picked up and released. Without pilot standardisation, the hook-up man should learn the technique used by each pilot. Does he come in fast or slow, high or low? Does he try to lift the load off with a combination of collective and cyclic? The hook-up man should specifically demand standardisation on the pilot technique for any sort of emergency occurring while he is beneath the helicopter.

• Know the cargo. Many items carried via sling are very fragile, others can take a beating. The hook-up man should always know when a hazardous article is involved, and the nature of the hazard; such as explosives, radio-active materials, toxic chemicals. In addition to knowing this, he should be familiar with the types of protective gear or clothing or actions that are necessary for his and the operation's safety.

All persons that board a helicopter while its rotors are spinning should be instructed as to the safest means of doing so. Naturally, if the pilot is at the controls, he could not possibly conduct a boarding briefing. Therefore, the individual who arranged for the passenger flight or assigned as the ramp attendant should accomplish this task. The exact procedures may vary slightly from one helicopter model to another, but in general the following should suffice:-

## Boarding



- Crouch low before getting under the main rotor.
- Approach from the side or front, but never out of the pilot's line of vision. Flights over rough or isolated terrain. All occupants should be told where
- Hold firmly to hats and loose articles.
- other object that might be blown off or away.
- Protect eyes by shielding with a hand or by squinting.
- If suddenly blinded by dust or a blowing object STOP-CROUCH LOWER OR BETTER STILL SIT DOWN AND AWAIT HELP.
- NEVER GROPE OR FEEL YOUR WAY TOWARDS OR AWAY FROM THE HELICOPTER.

### Pre-take off briefing

Since few helicopters carry cabin attendants, this briefing must be made by the pilot. The type of operation will dictate what sort of briefing is necessary. Passengers should always be briefed on:

• Stay away from the rear of the of flotation gear and other survival

equipment that might be on board. How and when to abandon ship should a ditching be necessary.

- maps and survival gear are located.
- Never reach up or dart after a hat or Emergency instructions. In the event of an emergency each passenger should be instructed as to what actions and precautions to take. Such as the body position for best spinal protection against a high vertical impact landing (erect with back firmly against the seat back). When and how to exit after landing.

## **Pre-landing briefing**

The nature of the landing area will determine what the passengers need to be told. A few items to consider are:

- If on a hill, depart downhill. If this involves walking around the helicopter to avoid the area of lowest rotor clearance always go around the front, NEVER THE REAR.
- Overwater flights. The location and use Repetition of the basic instructions already discussed.

## **IT CAN TAKE ONLY SECONDS**

Early on a showery autumn morning, a Debonair carrying four friends returning to Sydney after a weekend playing bowls in the country, took off from Dubbo for Hoxton Park aerodrome. Less than 20 minutes later, all were dead and their near-new, fully serviceable Beechcraft, had been reduced to the charred mass of wreckage shown in the pictures.

What went wrong? Simply that the pilot, a normally careful and conscientious, middleaged private pilot, had become yet another victim to the insidious temptation to "give it a go" when the weather was obviously marginal for VFR flight.



## AN AWARD FOR THE DIGEST



Though modesty might constrain us to say nothing, we feel that most of our readers would want to know that the Flight Safety Foundation in the United States has selected the Aviation Safety Digest as a winner of their "Publication of the Year" award for 1972!

The award, which was in recognition of the publication's contribution to air safety, was presented by Governor John H. Reed, Chairman of the U.S. National Transportation Safety Board, on behalf of the Flight Safety Foundation.

The presentation took place at a function associated with the Foundation's 25th International Air Safety Seminar in Washington, and was accepted, on behalf of the Department, by the Assistant Director-General (Air Safety), Mr. D. S. Graham, who was in Washington to attend the Seminar and a further meeting convened by the National Transportation Safety Board.

The Minister for Civil Aviation has publicly expressed his view that "the Foundation's recognition of the Digest is a high bonour indeed". The staff of Aviation Safety Digest certainly regard the award as an bonour and find encouragement in such appreciation of their efforts.-

Mr. D.S. Graham, Assistant Director-General, Air Safety, (seated) shows the award to Mr. R.M. Whitecross, Director, Data Analysis and Safety Education, (Left) and Mr. G. Macarthur Job, Editor of the Digest, (Right)

THE pilot, an active member of a Sydney suburban bowling club, had been flying privately for a number of years, during which he had accumulated almost 150 hours experience. Most of this time had been flown on Victa and Musketeer aircraft, but about three weeks before the accident he had obtained an endorsement on the Debonair. For several years past, the pilot had been making occasional weekend trips to Dubbo with fellow club members to play bowls, but

had been away.

The Debonair was left tied down over the weekend and early on the Monday morning, the pilot and his three friends were driven back to the airport to prepare for the return flight to Sydney. It was still dark when the pilot arrived at the flight service unit and, in response to the duty officer's greeting and remark on the earliness of the hour, the pilot said that he always liked to give himself plenty of time to flight plan and check his aircraft before departing. He was given copies of the area forecasts which indicated that this was the first time he had flown there although the weather east of the ranges in an aircraft of the performance of the and on the coast was satisfactory for Debonair. He was clearly pleased with the visual flight, there was extensive cloud of stratus at 1,000 feet AMSL was he reached Wellington.

forecast. After examining the forecast, the pilot commented that although it wasn't the best, "it wasn't all that bad". When the flight service officer mentioned that similar conditions had existed the previous morning and that several aircraft had diverted into Dubbo and Narromine because they were unable to cross the ranges between Wellington and Bathurst, the pilot replied lightheartedly that "their holiday had to come to an end sometime", and that they had to get back to work. He then went to the window and looked out at the weather. It was still quite dark at the time, but it was not raining and through breaks in the cloud Debonair and, when the party reached cover with scattered showers and drizzle stars were visible. The pilot commented Dubbo on the Saturday morning, he over the ranges and western slopes. As that if he could not get through, he remarked to a friend who met them at well as two eighths of cumulus cloud at would return to Dubbo and the flight the airport, that it was a pleasure to fly 3,000 feet, and five eighths of service officer gained the impression that and was the best aircraft in which they strato-cumulus at 3,500 feet, five eighths he would make this decision by the time

Returning to the aircraft after completing his flight plan, the pilot rejoined his companions and, while they loaded the luggage, he carried out a daily inspection. In conversation with the friend who had driven them back to the aerodrome, the pilot mentioned that Sydney was clear and gave the impression that he had no doubts about the weather. He indicated that they would be flying above the low cloud that prevailed in the Dubbo area.

Shortly after 0700 hours the party boarded the aircraft and the pilot started the engine. They taxied away and a few minutes later, after a normal engine run-up, the aircraft took off on runway 23, and turned left on to its flight planned heading. The pilot's departure report, passed at 0718 hours gave an estimate for Bathurst of 0751. His acknowledgement of the area QNH was the last transmission received from the aircraft.

Shortly after 0730 hours that morning, a farmer whose property lies close to the base of the Catombal Range, 12 miles east of Yeoval and 33 nautical miles along the aircraft's flight planned track from Dubbo, heard the sound of an aircraft engine which suddenly surged twice to high power. A loud sound of impact followed from the direction of the cloud-enshrouded range. Light drizzle was falling from low cloud at the time and the sky was completely overcast.

After checking with his neighbours and finding that they also had heard the impact, the farmer telephoned the police in Wellington who in turn contacted the Dubbo flight service unit. The Debonair was the only aircraft operating in the vicinity at the time and when no contact could be established with it the Distress there did not appear to be any survivors. Phase was declared. From Wellington a It was nearly two hours before the radio-equipped police vehicle set out to ground party were able to reach the meet the farmer near his property so that he could guide them in the direction of the crash. Meanwhile, three aircraft prepared to join the search. At 0830 hours, an IFR equipped Piper Aztec departed from Dubbo for the search area, but a Beech Baron which had refuelled at Parkes, and a privately owned Cessna 172 based on a property not far from the feet above the general height of the accident site, were unable to take off surrounding terrain. The impact point because of the poor visibility and low was on hard rocky ground and the cloud. The local weather was improving wreckage, which was almost totally however, and by 0915 hours, though consumed by fire, was confined to a very there were still some showers and patches small area. From the condition of the of fog in the area, the pilot of the Cessna wreckage, and damage to the tree foliage 172 was able to depart. Three minutes above the site, it was clearly evident that later he reported sighting wreckage close the aircraft had struck the ground at a to the northern-most tip of the Catombal very steep angle of descent and at high Range. Smoke was rising from it and speed.



Above: The section of the Catombal Range on which the Debonair crashed, as seen from the western side. The arrow indicates the accident site.

Below: Map showing planned track and area in which accident occurred.



almost inaccessible crash site and confirm that the wreckage was that of the burntout Debonair and that all on board had been killed.

The site of the crash was close to the crest of the main ridge of the Catombal Range, some 2,000 feet AMSL and 600

The almost total destruction of the aircraft by impact and fire rendered any assessment of its airworthiness before the accident extremely difficult, but what examination was possible, disclosed no sign of any pre-impact failure. As well as this, a detailed examination of the aircraft's log books revealed no evidence of any significant malfunctions throughout its entire operating life of less than 1.000 hours.

The pilot was correctly endorsed to fly Debonair aircraft, but his experience on the type was limited to a total of only nine hours. He did not hold an instrument rating and there was no evidence that he had undertaken any instrument flying training.

Despite the pilot's comment to the flight service officer that the weather did not appear "all that bad". Visual Meteorological Conditions did not exist



The burnt out remains of the Debonair. The almost vertical angle of descent is evident from the relatively undamaged surrounding tree foilage.

at the time of the accident over the well-broken layer of stratiform low cloud greater part of the route between Dubbo soon after setting course. Presumably to Sydney. From the observations of witnesses close to the accident site and those of the captain of a Fokker Friendship which arrived at Dubbo from Sydney soon after the accident occurred, it is evident that there was considerable strato-cumulus cloud with a lower layer of stratus and general light rain in the vicinity of the accident site. The Friendship captain said that, on descent into Dubbo, they had entered the cloud at approximately 7,000 feet in the vicinity of Wellington, and had not broken out until 700 feet above ground level, i.e. 1650 feet AMSL and only 100 feet above the NDB circling minima at Dubbo. As the elevation of the accident site was 2000 feet and the aircraft had struck the ground at this level in a steep nose down attitude, it is extremely unlikely that Visual Meteorological Conditions would have existed at the height at which the aircraft was flying shortly before the accident. This judgement is supported by the evidence of witnesses on the ground close to the accident site who said that the Catombal Range was enshrouded in cloud at the time they heard the sound of impact.

The exact circumstances that overtook the Debonair between the time it passed from sight of those who saw it depart from Dubbo, and when the sound of impact was heard on the Catombal Range, can of course never be known for certain. Nevertheless, it seems probable that the seeds of this disaster were sown when the pilot followed his stated intention and climbed above the continue visually in increasingly heavy

in doing this the pilot intended to cruise "on top". But instead, he would have found himself, still at no great altitude above the ground, between the broken stratus layer below the aircraft, and the only a little above his cruising level.

As the aircraft continued flight-planned track over the gradually vertical development and sky coverage. As well, areas of drizzle and light rain falling from the cumulus cloud formations would have resulted in steadily deteriorating visibility. The forecast visibility in rain showers was five miles. but in view of the actual conditions described by witnesses, it was probably a good deal less than this in the vicinity of the accident site.

The pilot had a reputation for being sensible and cautious in his approach to flying, and it seems almost inconceivable that he would have deliberately convisibility reduced perhaps to as little as minute, almost twice what the pilot had imagine the pilot being suddenly deprived of visual reference almost before he realised it. Perhaps while trying to

rain, with his view of the ground now almost totally obscured by the increasing cloud coverage beneath the aircraft, the pilot might have suddenly found himself in cloud with almost no warning of the transition. Once this had happened, only a rapid emergence of the aircraft from the cloud again could have saved the situation. Deprived of all visual reference and with no instrument training to help him, even an attempt by the pilot to continue straight and level would very soon be doomed to failure for the reasons explained in "Sensory Illusions in Non-Visual Flight", published in Digest No. 75 last year. On the other hand, if the pilot had tried to turn back in an effort to regain visual reference, the inevitable processes of disorientation and loss of control would have been even more rapid, quickly precipitating a complete loss of control. In either case, in such an aerodynamically "clean" aeroplane as the Debonair, the result would almost certainly have been a high speed spiral dive from which there would have been almost no hope of recovery in the height available, even if the aircraft emerged from cloud before striking the ground.

Another possibility is that the pilot, while attempting to continue visually at low level between the cloud layers in deteriorating conditions, might have overlying cumulus and strato-cumulus suddenly been confronted by the steepcloud, with a base of about 1,500 AGL, sided north-western face of the Catombal Range, rising out of the layer of stratus cloud below the aircraft. An instinctive south-eastwards, following its reaction to pull back on the control column, perhaps at the same time rising terrain that forms the western attempting to turn back, might have slopes of the Great Dividing Range, both resulted in the aircraft climbing quickly cloud layers would have increased in into the over-lying cloud layer, with similar results to those already described.

> Whatever the actual mechanics of the accident, there can be little doubt that the combination of the pilot's anxiety to continue the flight back to Sydney, the deteriorating visual conditions, and the unaccustomed speed of the aircraft, placed the pilot in a situation where he was left with insufficient time or room to manoeuvre when it finally became obvious to him that it was impossible to continue the flight visually.

Far from being simply another straighttinued the flight into cloud. But with the forward case of "pressing on regardless". the fact that an accident of this sort one mile, and the Debonair devouring happened to a mature and cautious pilot, airspace at the rate of nearly three miles a exemplifies all the more the dangers that can be involved in "having a look" at the become accustomed to in the other weather when conditions are obviously aircraft he had flown, it is not hard to very marginal for visual flight. These dangers can only be compounded in high performance aircraft, particularly if the pilot's judgement is not conditioned to that degree of performance.

## **Pilot Contribution**

# **Storm cells** are no joke!

Several aircraft have been lost, some without trace, during the last few years while attempting to follow the coast visually in poor weather. Two such cases reviewed in the Digest recently, concerned a PA-23 in Western Australia, and a Cessna 320 on the north coast of New South Wales. Another, discussed in our March issue last year, involved a PA-22 that disappeared while flying between Finschhafen and Cape Gloucester, P.N.G., when there were thunderstorms in the vicinity. Two more instances several years ago, which were not covered in the Digest for want of any worthwhile evidence, concerned a Cessna 180 flying from Sydney to Brisbane, and a Victa Airtourer flying down the Queensland coast. In all these cases the weather in the area in which the aircraft was lost was adverse with low cloud, rain, and in most cases isolated thunderstorms. In each case the investigation, for lack of other evidence, was left with no alternative but to conclude that with no instrument flying experience, the pilot had been deprived of visual reference, became disorientated and lost control of his aircraft.

The experience now recounted by our contributor, gained during a recent flight from Australia to Europe in a Cessna 310, suggests that the whole practice of flying coastal at low altitude to remain visual in poor weather can be fraught with danger even for experienced instrument-rated pilots!

77E had flown through monsoon weather from Singapore to poon, thence to Calcutta and Bombay from Bombay directly west across Indian Ocean to Masirah, a small d off the coast of Arabia accom-

cruit was a Cessua 310 with cket tunks giving a range in excess 600 n.m., very well equipped for conditions but without radar. The and the command was a reasonably spericiced IFR pilot and both he and co-pilot had flown through the tensoon on a number of occasions. This an involve hours of very uncomfortable

flight through vast watery masses of spersed - according to the forecast nimbus. Turbulence is quite often severe, but usually there is no control problem.

The weather at Masirah this day was miserable with high cloud and misty rain, but otherwise flying conditions were excellent: Our next stop was Muscat, some 300 miles to the north, and because the approach to this airport is very bad it is probably the only airport in the world that has a "dog leg" in the runway - the most experienced pilot was persuaded to take the left hand seat. The R.A.F. weatherman advised that because build-ups were likely over the 7,000 foot mountains to the north, our best route would be coastal VFR. So this leg promised to be 'a piece of cake' - no navigational problems, no weather problems and the aircraft fat with fuel for the distance involved!

We climbed to 2,000 feet, set the maintain attitude reasonably well; cumulus and large cumulus cloud inter- auto-pilot and munched biscuits as we although the airspeed was fluctuating watched the beaches skirting the vast between 80 and 140 knots, with the stall with three to four eighths of cumulo- expanse of desert on our left slip by. warning blowing occasionally, and the After half an hour or so, the rain rate of climb indicator going both ways, increased somewhat and we found that we had comparatively little difficulty in 600 feet was a good altitude, a maintaining a correct nose attitude. But compromise between a safe height and no such comment could be made about adequate visibility - after all many pilots lateral control. The aircraft was in fact fly far lower than this to maintain visual quite out of control laterally for long reference when flying coastal! The rain periods at a time. The rate of rotation became quite heavy but as there was no was far greater than anything we had low cloud and therefore no necessity to previously experienced, and at times even full control deflection in the opposite descend below 600 feet, the three of us were enjoying our pleasant little ride. sense could not prevent a wing from continuing to descend in a most determined manner. The aircraft seemed intent on turning on to its back and 70 to 80 degrees angles of bank were not uncommon. Whenever the aircraft was level, the D.G. would steady on about 290 degrees – the worst possible direction because it was taking us towards

But suddenly-we came to the end of the world: we had flown into thin black cloud, indistinguishable from the rain, but in a minute or two the visibility had reduced to nil and turbulence had become extreme. Our first thoughts were that this must be a very local phenomenon and we would quickly be through, but it was soon apparent that we the flinty mountains of Oman. had blundered into a storm cell. Six levers All on board remained calm but to were pushed forward, auto-pilot turned those not flying, the turbulence seemed off, and the little "aeroplane" on the far worse than to the pilot who was artificial horizon raised to give best rate fortunate in having the advice and of climb speed. Our obvious alternatives, assistance of an experienced co-pilot. The bearing in mind the 7,000 foot mountains gently repeated advice to turn east was to the north-west, were either to turn helpful, but as soon as a mild turn to the back or turn east over the water. The east was started, the rotational forces only problem was that we could not would again try to turn the Cessna upside maintain directional control! We could down. It seemed more important then to go the wrong way right side up than the right way upside down!

> The physical and mental effort of applying full control deflection almost continuously became tiring after about 15 or 20 minutes, and at times the end result appeared to be so inevitable that it hardly seemed worthwhile continuing to wrestle with the controls. Yet there was still time for routine things such as idusting mixtures and checking the engine gauges! Throughout it all, as well as the marginal appearance of the black ged type of cloud in which we were lying, we were treated to spectacular flashes of lightning, often quite close, and torrential min interspersed with hail.

> After about 30 interminable minutes. we finally emerged at 6,000 feet to find ourselves over fairly high ground, but still at a safe height. There are no navigation aids or communications in this area and spemingly almost in silence, we pinwinted our position in bright somshine nd wended our way up the coast, passing beam the 7,000 foot mountains which come down to the seashore.

> After our awesome encounter. the curved approach through the narrow gap in the broken range of hills that goord the crooked minway of Museal scarcely aised an eyebrow! -

The end of the race! The Beech 36 after forced-landing in a paddock just short of its lectination



S OON after setting course, it became entered a drainage ditch and was commented that they had been so obvious that they would not be able dislodged. The aircraft slid to a stop on startled by the high fuel flow indication to attain their planned cruising altitude because of a layer of stratus cloud which obscured the whole sky. Indeed, by the time they were within 40 miles of Mildura, they were being forced to fly just below the cloudbase, and only 500 feet above the ground.

At this low altitude, the fuel flow indication seemed to be so much greater than their calculated consumption rate, that the crew concluded that the gauge was not reading accurately. When abeam Hay however, the starboard fuel tank ran dry, and the pilot became concerned about the quantity of fuel remaining. He decided to reduce power to 24 inches and 2500 RPM to improve the consumption rate and the fuel flow gauge returned to a normal 15 U.S. gallons. By the time the aircraft was thirty miles from their planned refuelling stop at Griffith, the port fuel tank gauge was giving a very low reading and the pilot again reduced power to 23 inches and 2400 RPM.

A few minutes later, while flying in rain only eight miles from Griffith, the engine failed without warning. The pilot turned to port, intending to land into wind, but then he saw a paddock on the starboard side which he assessed as being suitable, and lined up for a down-wind landing. He selected the undercarriage down, and flaps to 20 degrees. Late on the approach he realised he would overshoot the selected area, and tried to bounce the aircraft over the down-wind fence, but it did not gain sufficient height to clear the obstacle, and ran through it in a nose high attitude. After running a short distance in of 22.2 gallons per hour could be competition, if safety the adjoining paddock the nose leg expected. Both the pilot and navigator first consideration.

the soft surface resting on its main undercarriage and nose cowling. Dejected but otherwise uninjured, the crew vacated the aircraft.

It soon became apparent during the subsequent investigation that the aircraft's fuel supply was completely exhausted, as only an insignificant amount could be drained from the tanks. The fuel lines and tanks themselves were checked and found to be in order and the engine was later test-run with no sign of any defect. It was also noted that the tank caps were securely in place and as there was no evidence of fuel stains indicative of leakage, it was concluded that the aircraft had either departed Parafield with less fuel than estimated, or the fuel on board was consumed at a greater rate than planned. On earlier stages of the race the crew had flown at relatively high altitudes and had calculated the average fuel flow to be 14 gallons per hour. Because the

planned cruising altitude for this leg was much lower, the pilot decided to base his fuel calculations on a consumption rate of 18 gallons per hour, thinking that this would be sufficient to allow for the lower cruising altitude. Neither crew member had made use of the Beech 36 power computer on board the aircraft either during the planning of the flight, or while airborne. However, when the computer was consulted during the investigation, taking into account the power settings used and the altitude at which they were flying, it showed that a consumption rate

Before departing from Parafield, S.A. for Griffith, N.S.W. on the last leg of an air race, the pilot and navigator of a Beech Bonanza were given a comprehensive meteorological briefing. After flight planning to cruise at 5,000 feet, using power settings of 27 inches of manifold pressure and 2,700 RPM, they boarded their aircraft and were duly flagged off.

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during the flight that they refused to believe it. The contents gauges were also showing a rapidly decreasing quantity of fuel, but they did not regard the indications as reliable.

It is understandable that the crew wanted only the minimum amount of fuel on board considering that they were flying in an air race. With minimum fuel, the all up weight of the aircraft would be reduced, and a corresponding increase in true airspeed would result. But it is difficult to understand why the pilot, when compiling his flight plan, did not use the "power computer" to assist him in calculating the fuel required for the flight. It is also strange indeed that, with a high fuel flow indication, and a rapidly decreasing fuel contents reading, the crew chose to disregard these factors and continue the flight at full power. Even when they eventually realised that a critical fuel situation existed, the accident was not inevitable as they could have diverted to another aerodrome or made a precautionary landing. Under normal circumstances this is no doubt what they would have done, but it seems that the pressure of trying to complete the race coloured their judgement to such an extent that they simply continued on until the fuel supply was exhausted. The accident obviously resulted from yet another variation of "press-on-itis".

It goes without saying that this must be tempered with mature judgement at all times, even in the emotional "heat" of competition, if safety is to remain the





A commercial pilot had planned to make a flight from Ullawarra to Geraldton, W.A. in a Sud Horizon, and after departing at 0625 hours the flight continued uneventfully for an hour and a half. But then while cruising at 5,000 feet the pilot suddenly noticed spots of oil appearing on the windscreen. Ten minutes later, as the oil flow was obviously increasing, the pilot decided he would have to make a forced landing.

The terrain over which he was flying was very inhospitable, the whole area being covered in mulga scrub so, he turned towards a dry lake some miles away. After crossing a road shortly afterwards however, the pilot saw that the oil flow was decreasing and he decided to divert to the airstrip at Carey Downs Station. But after the aircraft had flown for about 10 miles in this direction the oil flow again began to increase so the pilot concluded that his best course of action was to return to the road he had seen and attempt a landing. By this time the entire windscreen was covered with oil, and he could only gain forward visibility by sideslipping the aircraft.

Arriving over the road, he saw that it was only a narrow track bounded by trees on both sides. As he lined up for a landing into the west, he noticed a large gum tree by the side of the road so he continued flying along the road until a lighter area of scrub appeared. He then shut down the engine, closed the fuel cock, turned off the ignition and master switches and approached to land straight ahead. Just before touchdown, the port wing struck a tree and was partially dislodged. The starboard undercarriage leg then dragged through a ridge of sand on the right side of the road, and the aircraft swung to the right, eventually coming to a rest at right angles to the track. The pilot was not injured and was rescued later that day. The aircraft was damaged beyond repair.





In southern New South Wales, the pilot of this Cessna 180 was spreading superphosphate in hilly country two miles from the agricultural airstrip he was using. About a minute after taking off with his third load, the engine suddenly lost power. The pilot immediately dumped the load, checked the mixture control, applied carburettor heat and tried pumping the throttle. There was a momentary increase in power, but then the engine died completely. As the aircraft was still at low altitude, the pilot was forced to land straight ahead on a lightly timbered hill-side. During its approach the aircraft struck several small trees and, shortly after touching down still under control, the port wing collided with a larger tree. The aircraft swung to the left and slid sideways down the slope of the hill for over 60 feet before coming to rest. The pilot was not hurt. A strip examination of the engine showed that one piston had disintegrated completely and another had begun to break up. Two cylinders were badly scored and the oil filter contained alloy particles. Altogether it was evident that the engine, which still had 87 hours to run before its next major inspection, had been operated beyond its normal limits and at high temperature, for some time before the accident. The pilot, who was also the aircraft's owner, had bought it from another operator only a short time before the accident.

## In Brief

After an uneventful flight from Archerfield, Qld., to a country airstrip, the pilot of this Baron made an approach to land. He had inspected the strip six days before and knew that, 1,000 feet beyond the threshold, there was a depression in the ground where the surface was soft. He therefore planned to land beyond this area, utilising the remaining 2,000 feet of the strip.

After a gentle touchdown on the mainwheels, just beyond the depression, the nosewheel contacted the ground, but almost immediately entered a further soft patch and sank into the surface to a depth of about two inches. With the aircraft still rolling fast, the rearward load was too great for the nose leg structure and it collapsed. The aircraft skidded to a halt on its nose, damaging both propellors.

The pilot had been advised the night before the accident that a small amount of rain had fallen, but he had apparently received no information concerning the serviceability of the strip. The accident serves to illustrate yet again the degree of care necessary when operating modern tricycle undercarriage aircraft, fitted with narrow, high-pressure tyres, on unsurfaced airstrips.

The pilot of the Cherokee damaged as shown in this photograph, had hired the aircraft to make an inspection of his property in central New South Wales. Approaching the property, the pilot intentionally lost height and, while inspecting a crop of wheat for skeleton weed, descended to about 35 feet above the ground. Suddenly, too late to avoid it, the pilot saw a two-wire power line ahead. Applying power, he flew directly at the wires, severing them with the propeller. The nose cowling and port wing were damaged, but the Cherokee remained under control and the pilot was able to make a safe landing in an adjoining

The circumstances of this wire strike are extraordinarily similar to that which led to the double fatality reviewed in our May issue this year\*, and the pilot, with his two passengers, can be thankful indeed at having got off so lightly.

It is probably true that the pilot's action in increasing power helped to sever the wires and reduce the risk of entangling the aircraft. Nevertheless, the real message of this accident is that such an extremely dangerous situation could have been avoided altogether if the pilot had not descended to an unsafe height.

\* (see "It's Not Worth the Risk", Aviation Safety Digest No. 79)



## In Brief



This Victa Airtourer crashed as a result of fuel exhaustion, only half a mile from Bunbury Airport W.A., after a NOSAR NO DETAILS flight from Kalgoorlie. The pilot did not prepare a flight plan before departing, but expected the trip to take about three hours. An hour and a half after departure, the weather deteriorated and the pilot was forced to descend from his cruising height to a few hundred feet above the ground, and to continue the flight beneath a layer of stratus cloud where there were occasional showers. The pilot selected full carburettor heat which he left applied, but did not adjust the mixture control. Arriving over his destination, after a flight lasting almost three and a half hours, the pilot began to circle the town before landing. Shortly afterwards, at 1,500 feet, the engine suddenly failed. The pilot began gliding towards the aerodrome, hoping to make a straight-in approach, but realised too late he would be unable to reach either the aerodrome or an adjoining field. The aircraft struck trees and crashed into a swamp and was damaged beyond repair. Happily, the pilot and his passenger escaped with only minor injuries, for despite the proximity of the crash site to the aerodrome, no one had seen or heard the accident and they waited five hours to be rescued! The pilot had not realised that continuous operation with full carburettor heat and a rich mixture selection would considerably increase the aircraft's fuel consumption.



Departing from Bankstown in mid-afternoon, the pilot of this Cessna 172 flew NOSAR NO DETAILS to Tumut N.S.W., where he picked up two passengers. On departure from Tumut he realised that it would not be possible to reach Bankstown again before last light, so he decided to remain overnight at Mittagong. Flying below a layer of stratus cloud 10 miles south of his revised destination, the pilot found that it was darker than he expected. He also saw that there was cloud on the hills in the direction of Mittagong and decided it would be safer to make a precautionary landing.

In fading light he selected a paddock and began an approach. Crossing the boundary fence, the pilot flared for landing but as he did so, he saw a large tree in the darkness ahead. He applied power and attempted to bank away to the right, but the port wing struck the tree. The aircraft cartwheeled, then fell on to its undercarriage and careered backwards until the tail collided violently with another tree. Despite the severe damage, only the pilot sustained a minor injury. The pilot had been flying privately for more than 20 years and had accumulated nearly 2,000 hours, yet this flight seemed to be characterised by lack of planning. Asked why he had not landed at Goulburn rather than attempting to continue to Mittagong when it was obviously getting late, the pilot said the aerodrome at Mittagong was "more handy to town than at Goulburn".



After heavy rain, an agricultural airstrip on the Darling Downs was unserviceable and the property manager suggested that the pilot of the Pawnee shown in the picture, should use a section of bitumen road close to the treatment area. The soft ground adjoining the road also made it necessary to confine the loader vehicle's movements to the paved surface, and a nearby intersection in the road was chosen as a loading base. Water flowing over the road on one side of the intersection, made it necessary to use the road as a "one way strip", landing towards the loader vehicle and taking off in the opposite direction away from it. This meant that, although the pilot was able to take-off into the 10 knot wind, he had to land downwind. He commenced spreading, and although all went well for the first three flights, the property manager saw that he was having some difficulty maintaining directional control on the narrow surface during each landing. Touching down normally after his fourth sortie, the pilot kept the aircraft straight at first but, as it decelerated, it swung off the bitumen. Plunging into the grass at the side of the road the aircraft ran into a flooded drain and overturned. The pilot, who was unhurt, was assisted from the aircraft by the loading crew. Examination of the road, showed that the bitumen was only 14 feet wide and flanked on both sides by narrow strips of tall grass and open drains about 20 feet wide.

