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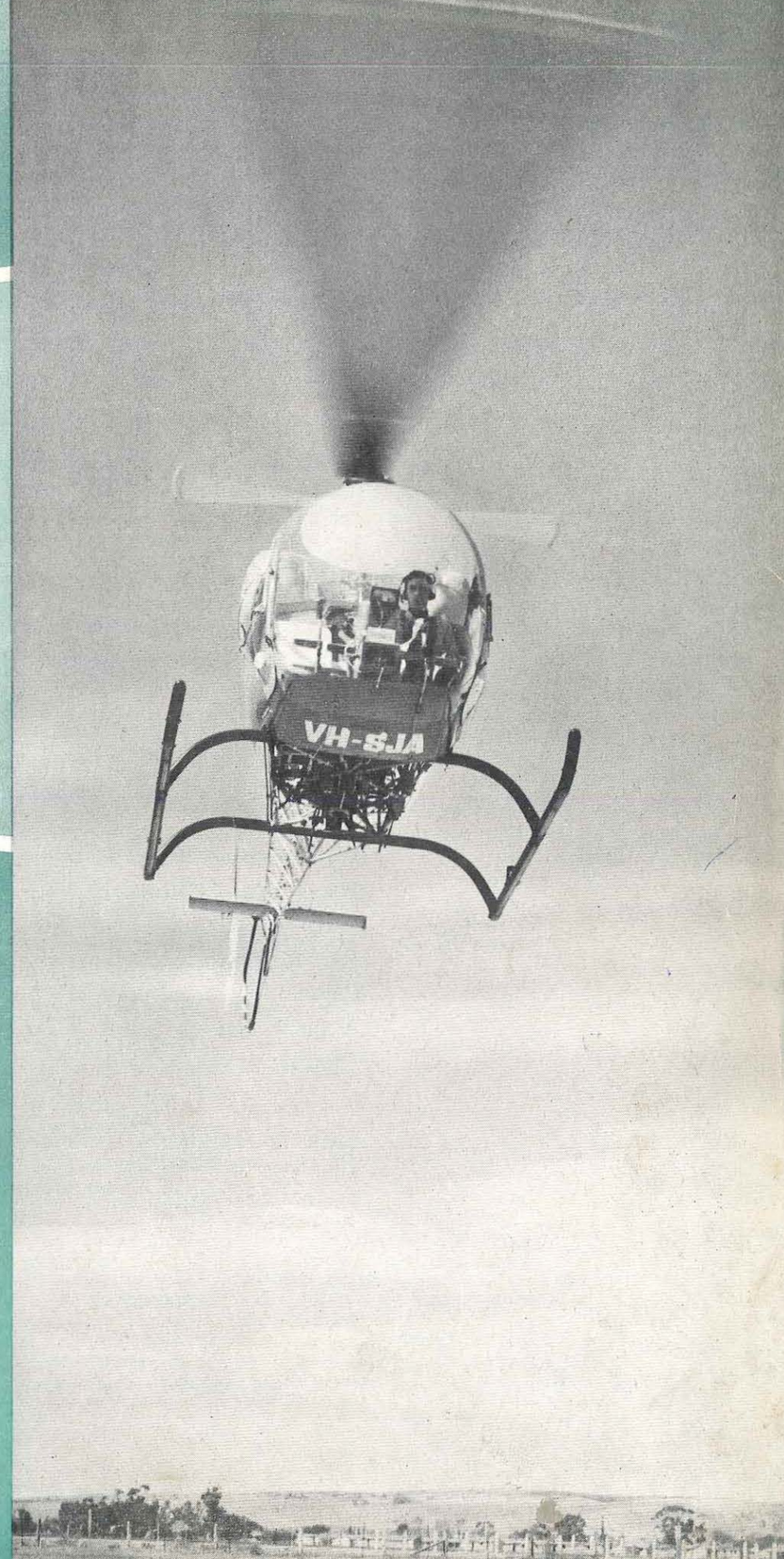
AVIATION SAFETY DIGEST

Department of Civil Aviation . . Australia

No. 49 MARCH, 1967



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Contents

Cover: *Australian Helicopters' recently acquired Bell 47G-5 comes in to land at Parafield, South Australia, at the conclusion of an aerial work operation.*

Aviation Safety Digest is prepared in the Air Safety Investigation Branch and published quarterly. Enquiries and contributions for publication should be addressed to The Editor, Aviation Safety Digest, Department of Civil Aviation, Box 1839Q, P.O., Elizabeth Street, MELBOURNE, C.1.

LOW CLOUD TRAPS MUSKETEER

Forty minutes after departure from a private aerodrome in the Geelong district of Victoria, a Beechcraft Musketeer crashed at Kingston, 12 miles north of Ballarat, in conditions of low cloud and poor visibility. The pilot and his three passengers were killed and the aircraft destroyed.

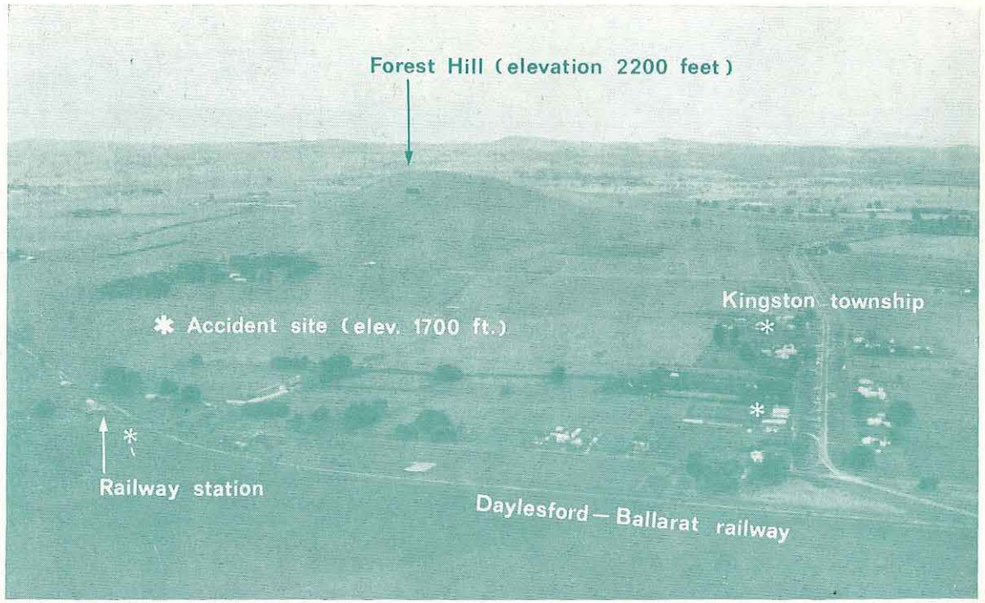
The aircraft belonged to a Victorian flying school and the pilot had previously arranged with the school to take the aircraft on a private holiday flight to Central Australia with three of his friends as passengers.

The pilot originally planned that the first leg of his flight would depart from Colac, Victoria, for Broken Hill with an E.T.D. of 0800 hours, and accordingly filled in the details of his proposed flight on a Flight Plan "B" form. At 0730 hours on the morning of the flight, the pilot telephoned Melbourne Flight Service Centre and obtained the current area forecasts for the areas through which his flight planned route lay. The forecasts indicated a generally cold south-westerly airstream of 20 to 30 knots below 5,000 feet, with clearing fog patches and isolated showers on the coast and ranges; visibility varied between 20 and 5 miles but was reduced to 500 yards in the fog patches. Four to six-eighths of stratocumulus cloud with a base of 2,500 to 3,000 feet and tops of 6,000 to 10,000 feet could be expected, and there was one to two-eighths of stratus cloud at 1,500 feet in the showers.

At 0800 hours, the school's chief flying instructor inspected the airstrip at Colac and finding it very wet, decided that it would be unsuitable for the Musketeer to take off with a full load. The aircraft was based at a private airstrip some thirty miles distant, and the pilot had intended to collect it from this strip and fly into Colac to pick up his passengers and their luggage. Now however, because of the condition of the strip at Colac, it was decided that the pilot and his passengers would proceed by road to the strip where the aircraft was based and depart from there.

The pilot and his passengers arrived by car at the private airstrip where the aircraft was located, shortly before 1000 hours, and the pilot again telephoned the Melbourne Flight Service Centre to obtain the latest weather forecasts for the areas through which they would be flying, as well as the current terminal forecasts for Mildura and Broken Hill. These later forecasts, although generally similar to the forecasts obtained earlier, indicated that the weather was gradually improving.

The chief flying instructor briefed the pilot that if he was unable to sight Ballarat he was to return. If he was able to reach Ballarat but the weather beyond was poor, he was to land at Ballarat and wait there for an improvement. The pilot then telephoned his completed flight plan



Aerial view of township of Kingston, looking south, showing positions of witnesses (*) and accident site

to Melbourne and after the luggage had been loaded and his three passengers had boarded the aircraft, the pilot took off at 1045 hours. The visibility at the aerodrome at this time was 15 to 20 miles to the north-west, approximately 5 miles to the south, and there was six to eight-eighths of strato-cumulus cloud at 1,500 feet and only one light shower in the area. The chief flying instructor watched the aircraft and saw it set course after take-off. A few minutes later the pilot established VHF contact with Melbourne and reported his departure time. At 1109 hours Melbourne advised the aircraft of a Notam issued for Broken Hill and the aircraft acknowledged the transmission. This acknowledgment was the last radio transmission received from the aircraft.

* * *

At Creswick, 10 miles north of Ballarat, a garage proprietor heard a light aircraft pass overhead on a northerly heading shortly after 1100 hours. Although the aircraft was obviously flying low, it could not be seen because the sky was completely overcast by very low cloud. Not long after this at Clunes, another 10 miles to the north-west, a man saw a light single engined aircraft fly over slightly to the east of the town. The weather was hazy with occasional showers and the sky was overcast by low cloud. The aircraft appeared to be flying quite fast and very low below the cloud base. It maintained a steady northerly heading and the engine noise seemed quite normal.

The aircraft was next seen late in the morning at Allendale, nine miles south-east of Clunes and on the railway which runs to Daylesford from Ballarat. At the time the sky was overcast by very low cloud and a man who lives in the town first heard and then saw, a single engined aircraft answering the description of the Musketeer flying near his house. It was flying very low in an easterly direction but was not beneath the cloud. Rather, the witness explained, he saw it "through the cloud" and could see the outline of the occupants in the cabin. The aircraft did not turn or circle the town, and he gained the impression that it was following the railway line towards the next station at Kingston, three miles further to the east.

At Kingston that morning, the weather generally was foggy and although the fog had lifted to the north, the sky was completely overcast by

low cloud. About 1120 hours, three residents of the township heard and saw the aircraft circle over the town several times at low level. One witness, said that after the aircraft had been circling the town for a few minutes, he was driving his car near the railway and saw the aircraft crossing the road just ahead of him. It was flying at about 100 feet above the ground in a south-easterly direction and appeared to be making a gentle turn to the left. The aircraft then went out of sight into the fog, and he stopped his car on the road near the railway station to watch for it. Shortly afterwards, he again saw the aircraft to the north-east still turning to the left and it flew round again over the road just ahead of him, at about the same height and on the same track as previously. It then vanished into the fog and a few seconds later he heard the sound of a crash.

A housewife who had come out of her home to watch the aircraft, said she saw it make two left hand turns around the town. The aircraft was visible when it was directly overhead but it went out of sight from time to time in the fog. On its second circuit, it passed over her house at about 100 feet above the ground, heading east. The aircraft's wings were level, then the left wing "dipped sharply", just before the aircraft went out of sight into the fog. The engine noise had been quite normal up to this time, but a few seconds later, she heard the engine noise suddenly increase and then stop; she did not hear the sound of the crash.

Another housewife said that the aircraft was visible occasionally through the fog while it was circling the area. It was turning to the left each time, very low and progressively moving towards the east. The sound of its engine was loud and it appeared to be running normally. Eventually the aircraft was out of sight altogether in the fog, but then she saw it again in the distance below the fog. The aircraft then descended from the fog, in a steeply banked, nose-down attitude, and crashed into the ground. The witness said she could hear the engine running normally all the time until the aircraft hit the ground and she heard the noise of the crash.

An inspection of the wreckage and the impact marks showed that the aircraft had struck the ground with very great force. The port wing had made the first impact, followed by the engine and propeller. The occupants had been hurled from the cabin and the aircraft had come to rest on its back with the fuselage grossly distorted and completely broken in two places. The port fuel tank had burst open when the wing had broken off, spilling the contents on to the ground, but the aircraft did not catch fire. The starboard fuel tank was undamaged and still full of fuel. The flying control cables were still connected to their respective surfaces and there was no evidence that the flying controls were anything but serviceable up to the moment of impact. The magneto switches were both on and the fuel selector was positioned to the port tank. The flaps were in the up position. The propeller, which was badly distorted from striking the ground under power, had snapped off from the crankshaft, complete with its mounting flange. This condition had clearly been brought about by a sudden, violent stoppage of the engine, from high RPM. Spark plugs taken from the engine showed that it had been operating satisfactorily before the crash.

* * *

The statements made by the witnesses, the fuel available in the aircraft, and the examination of the wreckage, produced no evidence whatever

The impact marks in the foreground give some indication of the force with which the aircraft flew into the ground.

that a loss of engine power or any aircraft defect had contributed to the accident.

The pilot had been briefed not to proceed beyond Ballarat if the weather was unsatisfactory, but being nearly three hours behind his planned schedule as a result of the last minute change in departure point, it is probable that he would have been most reluctant to incurr any further delays by having to land at Ballarat unless it was absolutely necessary. As well as this, the area forecasts he had obtained suggested that the weather was improving.

The evidence of the witnesses, suggests that the aircraft continued northwards over Creswick and Clunes, both of which are almost on the direct track from the aircraft's aerodrome of departure to Mildura. The aircraft was apparently flying low above overcast cloud at Creswick, but was below the low cloud by the time it reached Clunes. From later sighting reports, it seems likely that after he reached a point somewhere to the north of Clunes, the pilot decided to return to Ballarat, probably because he found the weather was not improving as expected. During or after his turn on to a reciprocal heading, he evidently intercepted the branch railway line which passes through Allendale and Kingston and decided to follow it, perhaps thinking that it would intercept the main line to Ballarat, or that it was the main line to Ballarat. In any case, it appears that the pilot was uncertain of his position when he arrived over Kingston. This township is not marked on the World Aeronautical Series Chart covering this area, and his circuits of the town might well have been an attempt to pinpoint his position by reading the name of the town on the railway station sign. In endeavouring to do so, the pilot could have unintentionally manoeuvred his aircraft into a position from where he was unable to avoid entering the extensive low cloud and areas of fog which the witnesses described.

Whether or not this was so, and irrespective of his reasons for circling the town at low level, there is no doubt that the aircraft flew into cloud at a low height. Having done this, it was almost inevitable that the pilot, not being trained in instrument flying, would have suffered disorientation, thus finally setting the stage for the accident.

CAUSE:

The cause of this accident was that the pilot proceeded, at a low height, into weather conditions in which visual flight could not be maintained, and being not qualified for instrument flight, he did not maintain effective control of the aircraft.

COMMENT:

If there are still any non-instrument pilots who think we are exaggerating the dangers of becoming disoriented in cloud, we suggest they also read the article "Don't Bend It" on page 16 of this issue.

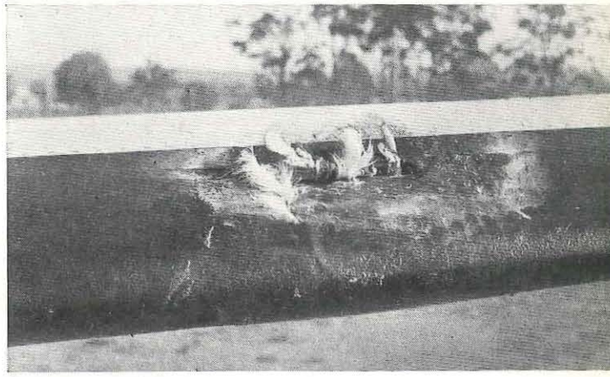
Danger Averted by Alert Pilot

While climbing to cruising altitude after taking off from Ejanding for a flight to Jandakot, W.A., the pilot of a Cessna 182 detected a change in the engine exhaust note and an occasional smell of exhaust fumes in the cabin. Immediately he recognized the condition, the pilot discontinued the flight to Jandakot and returned and landed at Ejanding.

The aircraft's exhaust system was inspected and it was found that a crack had developed in the exhaust muffler, allowing exhaust gases to seep into the cabin heater ducting.

From time to time, the Digest has reported overseas accidents to light aircraft, in which failures of the same sort have caused carbon monoxide poisoning of the occupants and led to fatal accidents. The Digest also discussed the problem in some detail in the article "Cabin Heaters and Carbon Monoxide," published in the March 1966 issue. There is no doubt that but for the vigilance of this pilot in recognizing the symptoms of exhaust system failure, and his awareness of the hazards involved, this latest incident might well have become another fatal accident.

Eagle versus Fokker Friendship



Just after taking off from Taree, New South Wales, and while climbing through 600 feet at 140 knots, the pilot of an F-27 sighted a large eagle in front of the aircraft. The eagle appeared to be in a shallow dive on a collision course towards the port wing. The pilot tried to miss the eagle by lowering the nose and banking to port, but the bird struck the leading edge of the wing about 18 inches inboard from the pitot head mounting. The jolt as the bird hit was severe enough to alarm the passengers, but control of the aircraft seemed unaffected and the pilot returned and landed at Taree aerodrome without difficulty.

Inspection of the wing showed that the bird had struck the leading edge of the wing, fracturing the de-icer boot, and opening up a six inch tear in the upper surface of the leading edge. The bird had then been forced through the hole into the leading edge section of the wing until it came to rest against the main spar. The spar was not damaged. (see photograph)

Reporting the incident, the pilot said he had experienced a number of previous near-misses with eagles in flight, when there had been no time to take evasive action. He was inclined to think that the collision might have been avoided if the aircraft had held a straight flight path.

Whatever the merits of this argument, the incident itself vividly demonstrates the hazards which birds can pose to aircraft in flight, especially when near the ground, and it provides a timely reminder to pilots generally, of the importance of reporting *all* bird strikes in flight, whether or not they cause damage to the aircraft concerned.

The provision of this information is playing an important part in the five year ecological study being carried out by the Division of Wild Life Research of the C.S.I.R.O., on behalf of the Department, to determine ways of clearing birds from the vicinity of aerodromes, and to assist in developing methods of dealing with the bird hazard problem as a whole.

Information on bird strikes is also being sought by the Department as part of a world-wide campaign being conducted by the Internation Civil Aviation Organization (I.C.A.O.), on the problems posed by birds to aircraft operations. To enable them to amass a reliable fund of data on the problem, member nations have undertaken to furnish I.C.A.O. with regular summaries of all incidents involving bird strikes. The summaries are required to include such details as altitude, airspeed, phase of flight, weather, type of bird and size (where possible), whether a single bird or part of a flock, details of any injuries sustained by occupants of the aircraft, section of aircraft struck, damage sustained and, if available, the cost of repair and/or the loss of revenue caused.

Obviously, the higher the percentage of bird strikes reported, the truer will be the picture that is obtained of the overall problem by the Department in Australia, and by I.C.A.O., throughout the world.

By furnishing Incident Reports on all bird strikes, and including all the information that is being sought, individual pilots make an indispensable and worthwhile contribution to the efforts being made to minimize this ever-present hazard to aircraft in flight.

CESSNA DESTROYED ON RIDGE

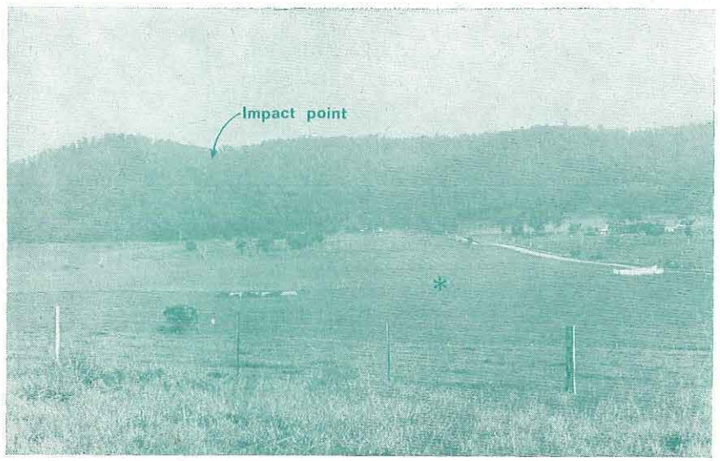
During a period of flying training, a Cessna 150 was seen to carry out a practice forced landing approach into a paddock towards an adjoining ridge of steep, timbered hills. After re-applying power the pilot attempted to out-climb the rising ground, but the aircraft struck trees and crashed and burnt 150 feet below the summit. The pilot was killed.

The aircraft belonged to a Victorian country flying school whose flying training area lies in an open valley among the foothills of the Great Dividing Range. The aircraft was being flown by a student pilot who had been authorized to carry out a period of forced landing approach practice in the training area.

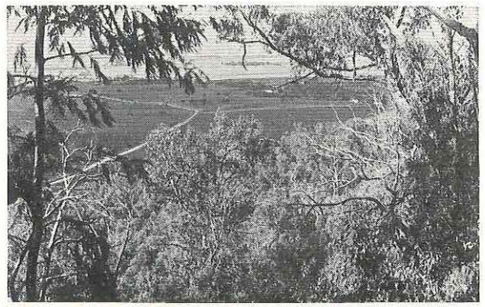
The student had arrived at the aerodrome at 0930 hours that morning, and after the aircraft he was to fly had been refuelled and the tanks checked for water, the student's flying instructor briefed him to carry out a period of practice forced landing approaches in the low flying area. It was his first period of solo forced landing practice, and the instructor informed the student that he was not to descend below 200 feet and that as the terrain in the low flying area was 200-300 feet above sea level, the minimum altitude on his altimeter was to be 500 feet. The student took off from the training aerodrome at 1000 hours and set course towards the training area.

During the next hour, the aircraft was seen by a number of ground witnesses carrying out practice forced landing approaches in the low flying area. A privately owned air strip is located inside the low flying area and with the agreement of its owner, is frequently used by the flying school's instructors for demonstrating forced landing techniques to students. On this occasion, witnesses saw the aircraft carry out about five practice forced landing approaches in the vicinity, one of them on to the strip itself. On this particular approach, the aircraft descended to a very low level before the pilot re-applied power.

A short time afterwards, other witnesses saw the aircraft carrying out what appeared to be a practice forced landing into a field outside the low flying area and less than half a mile from a steep ridge of hills rising more than 500 feet above the surrounding terrain. Heading in the direction of the ridge, the aircraft continued its approach into the paddock to a very low altitude, estimated to be about 30 feet, then commenced to overshoot straight ahead towards the ridge. As the aircraft climbed up the face of the ridge, its nose-up attitude progressively steepened until, as it neared



The paddock into which the student carried out his last practice forced landing approach, looking in the direction of flight. The asterisk indicates the position from which the pilot re-applied power to overshoot. The point of impact can be seen close to the top of the timbered ridge.



This view, from the accident site back in the direction of flight, gives some idea of the height and steepness of the ridge over which the pilot attempted to climb. The paddock into which the pilot approached is in the centre of the picture, obscured by the line of trees in the foreground.

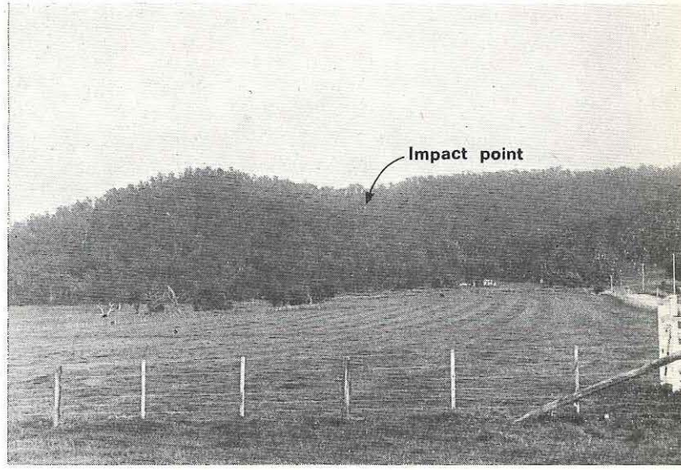
the top of the ridge, it struck a tree and dived into the ground. Smoke was seen to rise up almost immediately and shortly afterwards the aircraft began to burn fiercely. It was some minutes before the witnesses who had seen the crash could reach the wreckage, and when they did so the aircraft had been almost completely consumed by the fire.

An examination of the wreckage did not reveal any defect or malfunction which could have contributed to the accident. The aircraft had initially struck a tree with the port wing tip, 150 feet below the level of the ridge, and, apparently at low forward speed, had then sliced its way through smaller timber before rolling on to its back and hitting the hillside in a steep nose-down attitude. The wreckage had then slid five feet down the slope before coming to rest upside down. There was evidence that the flaps had been extended five or ten degrees but because of the extensive fire damage, it was not possible to determine the power setting at the time of the crash. The weather at the time was fine and clear with a light southerly wind, and had no bearing on the accident.

A farmer, who was standing at the foot of the ridge when the accident occurred, said that at about 1125 hours, he noticed a small aircraft flying towards him from the east at very low height, and as he could not hear any engine noise, he thought it was going to land in the paddock in front of him. When the aircraft had descended to about 30 feet above the ground however, the pilot opened the throttle and began to climb away again towards the ridge. The aircraft passed low over where the farmer was standing, with the engine running normally. It flew on over a small spur on the ridge, and disappeared from his view. The farmer noticed that leaves and branches on the trees on the top of the spur were disturbed as the aircraft passed over them. A few seconds later he heard the crash as the aircraft struck the trees on the ridge beyond the spur.

The flying instructor who had been responsible for the student's training, said that the student had been shown the boundaries of the flying training area during his initial period of training and he had been given a chart setting out these boundaries. The instructor who had demonstrated practice forced landings to the student, said that most of the approaches had been made in the vicinity of the private air strip in the training area, as was most dual instruction in forced landings in that locality. On these demonstrations, the instructor said, he usually descended to about 50 feet, but he had specifically briefed the student that when flying solo, the minimum permissible

View of ridge from the point at which the pilot commenced to overshoot. Note the illusion created by the line of timber—the paddock adjoining the timbered slopes appears to be almost level, whereas in fact it has an upward slope of more than three degrees. Compare the impression of the height of the ridge in this picture with that in the one at the top of the page.



altitude was 200 feet above the terrain. He had not made a point of briefing the student on the danger of rising terrain when carrying out forced landing practice.

The flying school's operations manual provides for specific fields to be nominated for the use of student pilots carrying out solo forced landing practice, and for the location of these fields to be displayed on a map in the operations room. Specific fields had not been nominated in this case and there was no map on display in the school's operations room.

The instructor said that the overshooting technique taught to students in Cessna 150 aircraft was:

> Power on — retract flaps to 20 degrees.
> After a positive increase in speed and height — retract flaps to 10 degrees.
> When 200 feet above terrain — retract flaps fully.

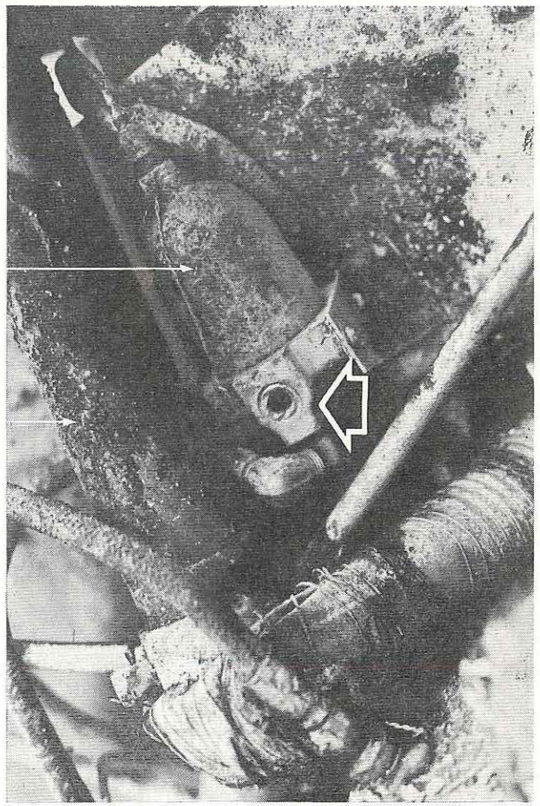
In this case, the instructor thought that the student would have initially climbed the aircraft at 60 knots, with 10 degrees flaps selected, but as the danger of the rising terrain became more obvious to him, he would have gradually raised the nose of the aircraft, thereby decreasing the airspeed towards the stall.

A climb gradient of more than nine and a half degrees would have had to have been made good by the aircraft for it to have cleared the ridge from the point at which the pilot commenced to overshoot. The climb gradient which the aircraft actually achieved to reach the impact point was just over eight degrees. It was calculated that the best possible climb gradient which a Cessna 150 aircraft could be expected to make good, at the all up weight at the time of the accident and under the existing meteorological conditions, is nine degrees. The achievement of this gradient, however, is dependant upon the pilot maintaining an indicated air speed of 46 knots with flaps up. Any departure from this configuration would result in a deterioration in the aircraft's climb performance. The normal climbing speed for the aircraft is 70 knots with flaps up and 60 knots with 10 degrees of flap extended. In view of the evidence that approximately 5-10 degrees of flap was lowered, it is very unlikely the pilot would have adopted the optimum gradient climbing speed as soon as he re-applied power.

To have avoided the ridge, the pilot would have been required to begin a 90 degree turn either to the right or the left almost immediately he re-applied power for the overshoot. Even if he had appreciated that some danger existed in climbing straight ahead however, his training and his lack of experience would probably have discouraged him from making a turn at such a low level. Because the impact point was 150 feet below the summit of the ridge, it is probable that, had the pilot begun his overshoot at a height of 200 feet, as specified by the flying school's operations manual for solo practice forced landing approaches, the accident would not have occurred, even though the exercise was carried out outside the authorized low flying area and the pilot chose an unsuitable field.

The field which the student chose for his final practice forced landing, though outside the low flying area, it is on the route which the pilot would have taken to return to his training aerodrome. It is thus possible that the pilot, having completed his practice, had begun to to return to the aerodrome but on seeing what looked to him to be a suitable paddock, decided to make one last simulated forced landing. It is this aspect of the acccident however, that is difficult to explain: Why should the pilot choose to carry out the practice forced landing towards such an obviously steep ridge?

The answer possibly lies in the nature of the terrain. Assessment of the steepness and height of hills from above, is itself a difficult enough problem for inexperienced pilots. In this particular instance, the problem was compounded by an additional factor From the air, the timbered ridge seems to rise out of generally flat, level ground. But this in fact, is an illusion created by the clear line of demarcation where the fields join the timbered slopes. From the point at which the aircraft began its overshoot, to where the farmer was standing watching it from the base of the ridge itself, the terrain slopes upwards at an average gradient of 3 degrees 20 minutes. It is obvious that the absence of this additional slope could have made all the difference to the pilot's attempt to clear the ridge after overshooting from his final forced landing approach.



The probable source of the fire which consumed the aircraft—the fuel filter bowl in the engine compartment of the inverted wreckage. As the aircraft struck the ground nose-first, the nosewheel strut was evidently forced back against the fuel filter bowl, fracturing the fuel line elbow and allowing fuel to spill over the engine.

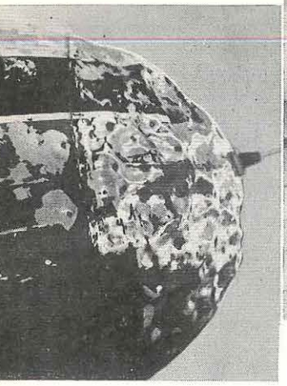
Lost and Found

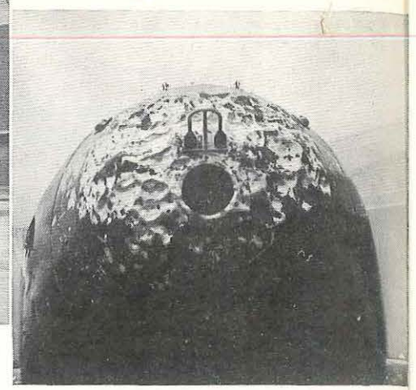
While approaching the Kokoda Gap during a flight from Port Moresby to Girua, Papua, the first officer of a D.C.3 noticed a spanner lying in the bottom of the ring cowling of the starboard engine.

The first officer immediately pointed it out to the captain, but as they were by this time almost half way to Girua, the latter decided to continue the flight. The captain instructed the first officer to watch the spanner, which was vibrating and moving about in the bottom of the cowling, so that the propeller could be feathered if the spanner showed signs of moving back into the engine.

The captain eventually feathered the engine when they entered the Girua circuit area, to obviate the risk of engine trouble developing during the approach to land. The captain also believed the spanner might be dislodged as the aircraft touched down.

The landing was accomplished on one engine without further incident. The spanner was later identified as one used by an employee who had carried out some minor maintenance on the aircraft under the supervision of a L.A.M.E. before the flight departed.





Beechcraft Damaged by Intense Hail

While making an IFR flight from Moorabbin to Warracknabeal, Victoria, in mid-October, a Beech 18 aircraft encountered a severe updraught and extremely heavy hail. The hail damaged the aircraft to the extent that it became necessary to divert to Ballarat.

The aircraft, which belonged to a charter company, was carrying a load of newspapers destined for country centres. With a crew consisting of pilot and radio operator, it had departed from Moorabbin at 1430 hours local time. The route forecast which the pilot had obtained indicated that there was rain over southern Victoria with four to seven eighths of cumulus and cumulostratus cloud extending from 3,000 feet to between 6,000 and 10,000 feet. Some cumulonimbus cloud was forecast on the ranges with tops above 20,000 feet. The wind was north-westerly at 20 knots, increasing to 35 knots at 10,000 feet and the terminal QNH was 1010 millibars.

A SIGMET, originated in Melbourne at 1254 hours local time, and valid to 2000 hours, had also been passed to the pilot before the aircraft's departure, and warned of active thunderstorm areas extending to 30,000 feet in the Melbourne Flight Information Region. The storms were moving east but little change was expected in the forecast period.

After setting course over Moorabbin at 3,000 feet, the aircaft proceeded via Essendon and on a track of 288 degrees magnetic, continued climbing to cruising altitude. The pilot had elected to cruise at 9,000 feet, because the forecast indicated that at this height the aircraft would be almost on the cloud tops and just above freezing level. The aircraft reached 9,000 feet eight minutes after passing over Essendon, and at this altitude was in and out of strato-cumulus cloud, maintaining track by reference to the Essendon NDB. The temperature was slightly below freezing point and a small amount of frost formed on the leading edges of the wings. Turbulence was slight to moderate.

Thirty miles out from Essendon, the cloud tops were higher than further back along their track, and the aircraft was in cloud for most of the time. The pilot believed that this was because of the higher terrain beneath them, but in view of the SIGMET he had received, he asked Melbourne Control if their radar could give any indication of thunderstorms along the aircraft's track. The long range radar unit at Melbourne however, is intended for air traffic control purposes, and is specifically designed to avoid echoes from weather phenomena. For this reason, it is not able to provide information on the location of thunderstorms.

The pilot continued on track and before long the aircraft was in cloud continuously. Turbulence was still slight to moderate with an outside air temperature of minus four degrees centigrade, and there was slight rime icing on the leading edges of the wings.

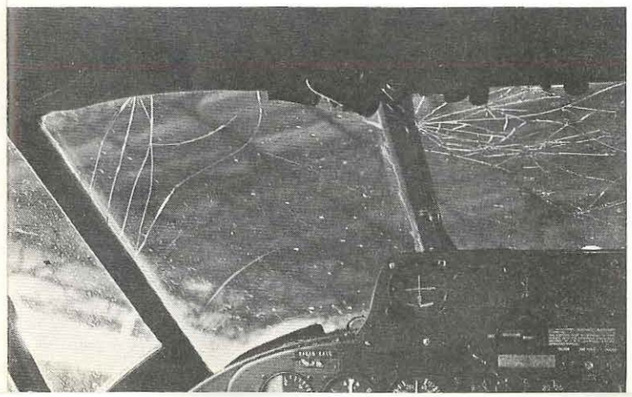
Abeam of Maryborough some 70 nautical miles out, the aircraft picked up the Nhill VAR which indicated they were right on track, and the radio operator then tuned the radio compass to the Lubeck broadcasting station. The radio compass bearing obtained was steady with no sign of atmospheric interference.

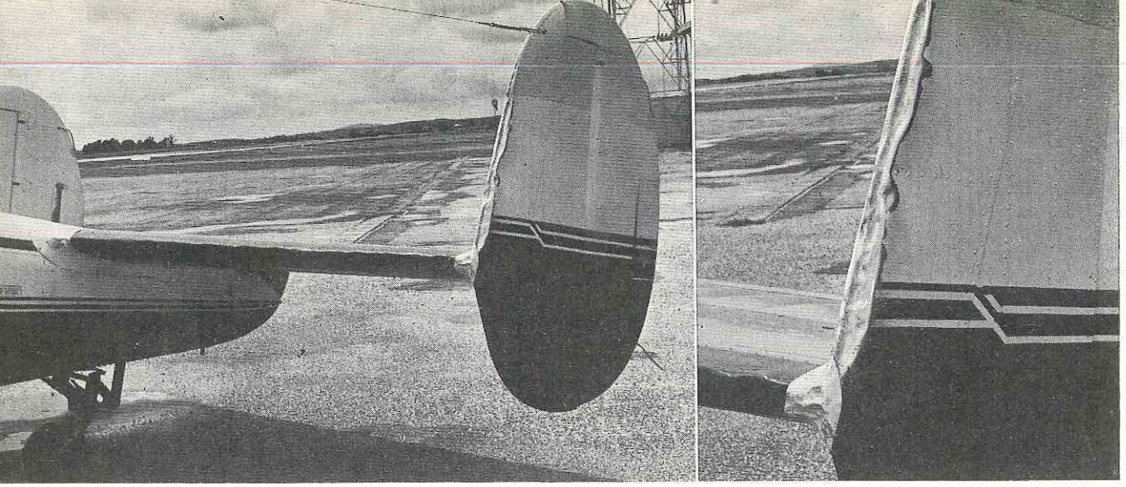
Shortly afterwards, without warning of any kind, the aircraft suddenly encountered a powerful updraught. The pilot throttled back the engines, but the airspeed built up quickly to about 170 knots and the aircraft climbed rapidly. The radio operator reported the situation to Melbourne Control and the pilot raised the nose to try and reduce speed. Almost immediately some isolated hail struck the aircraft and rapidly developed into extremely heavy hail. The airspeed fell off, fluctuating between 95 and 140 knots and the aircraft became difficult to handle laterally. The turbulence itself was not severe but the aircraft seemed to be wallowing in a constant updraught.

At 10,000 feet, the pilot began a turn to port to escape the storm cell. At the same time, the radio operator reported the hail had cracked a windscreen panel. With the engines now throttled back to idling, the pilot continued the turn to port, intending to bring the aircraft around on to a northerly heading. An emergency descent was obviously now necessary and lower terrain lay in this direction. The hail continued to batter the aircraft as they turned, cracking two more windscreen panels, but as they took up a northerly heading, the hail ceased and the aircraft stopped climbing. Their altitude was now 11,500 feet. During the turn the radio operator had applied full carburettor heat to both engines as there had been an indication of icing on one engine and now the engine oil temperature gauges were indicating very low. The pilot therefore re-applied some power, lowered the undercarriage, and commenced a descent at 95 knots while the radio operator held his hands against the cracked windscreen panels to prevent them blowing in. The radio operator also made several attempts to report the situation to Melbourne but was unable to establish contact.

Breaking out of cloud initially at 5000 feet, the pilot weaved his way around lower patches of cloud and continued descending visually to 1000 feet above the terrain. When he had established that the aircraft was flying satisfactorily and that the engines were delivering normal power, the pilot turned south again to proceed to the nearest suitable aerodrome at Ballarat. Further attempts to contact Melbourne on both VHF and HF were unsuccessful, but the pilot experienced no further difficulties in controlling the aircraft and made an uneventful landing at Ballarat at 1539 hours.

The cracked windscreen panels as seen from inside the cockpit.





The leading edges of the aircraft's twin fins were literally flattened by the impact of the hail.

The aircraft had been considerably damaged by the hail. The nose dome was a mass of large indentations and there were smaller dents along the fuselage back as far as the rear cabin door. The rotating beacon was completely destroyed, all the windscreen panels had been broken and two of the panels of the cockpit's side windows were cracked. On the tail assembly, the entire leading edge of the tail plane was dented and the leading edges of the fins were literally flattened.

The pilot said that he estimated the aircraft was in the updraught and hail for three to four minutes. During this time the crew saw several lightning flashes but there had been no sign of lightning before they encountered the hail.

Despite the widespread damage sustained by the aircraft, it seems that its flying characteristics were not dangerously affected. Nevertheless, it is clear that the crew could have been in very serious difficulties if the windscreen panels had failed completely during the violence of the hail. With the increasing number of light and medium twin-engined aircraft that are now operating under instrument flight rules without the protection of airborne weather radar, it is obvious that this situation could occur again. For this reason, pilots of such aircraft would do well to avoid conditions where thunderstorms could lie concealed in more innocuous types of cloud.

AEROPLANE DRIVERS

A student pilot, after completing his second solo flying period, was taxi-ing his Cessna back to the parking position on the apron. The pilot had taxied in from the runway via a concrete taxiway. On moving on to the apron he began a turn to the right to park in front of the terminal building. As the aircraft swung around, the port wing tip struck an airline loading platform also positioned in front of the building. The fibre glass wing tip was shattered, and the leading edge of the wing dented near the tip.

When questioned about the mishap, the student explained he had forgotten about allowing clearance for the wing because he "thought he was in his car"!

Incredible . . . !

Just before last light, air traffic controllers at a busy secondary airport sighted a Tiger Moth on short final for a non-duty runway. Hardly visible in the dusk, the aircraft had not called the tower for a clearance to land, was carrying no lights, and was approaching 90 degrees out of wind. Another aircraft about to take-off had to be held until the Tiger Moth had crossed the duty runway.

The Tiger rolled almost to a stop and "weather-cocked" into wind, then, continuing to ignore the "red" being directed at it by the Tower, proceeded to taxi through a large coned-off area of the aerodrome under reconstruction. The Tower quickly despatched a vehicle to intercept the aircraft and the controller in the vehicle directed the pilot to taxi straight ahead out of the unserviceable area and to turn left on to the taxiway.

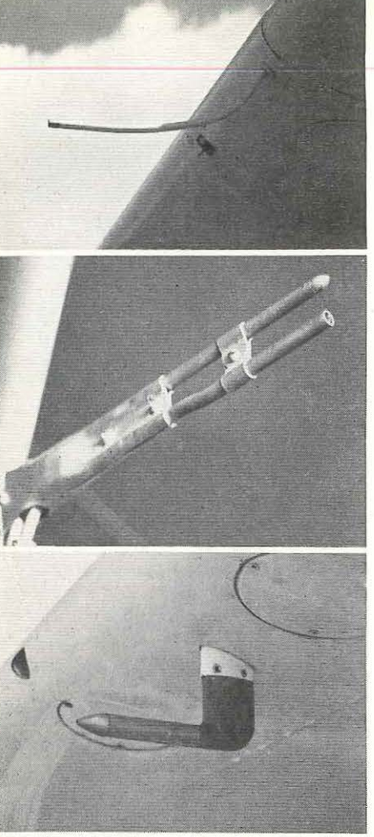
Instead, the pilot, who was alone in the Tiger Moth, taxied straight across the taxiway and behind a line of parked aircraft. Here he stopped his aircraft with the engine running, climbed out, then with one hand in the cockpit, continued to taxi the aircraft while he walked beside it. Almost speechless by this time, the controller following in the vehicle managed to point out that this was hardly the way to taxi an aeroplane, especially in close proximity to other aircraft, and the pilot was finally persuaded to shut down his engine and push the Tiger into a parking place.

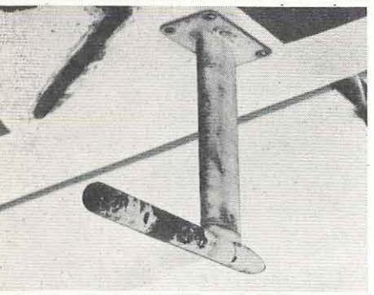
Giving an account of himself later, the pilot explained he had been delayed during his flight when he landed to refuel. When at last he departed again, he expected to reach the destination airport at 1750. Asked if he had determined the time of last light at the airport, the pilot said he had read in a country newspaper that sunset was at 1737, so he thought it would still be daylight at 1750. His radio was not working properly as he was approaching the airport via a light aircraft lane of entry, so he switched it off. In any case, he did not think the Tower would be working so late in the day.

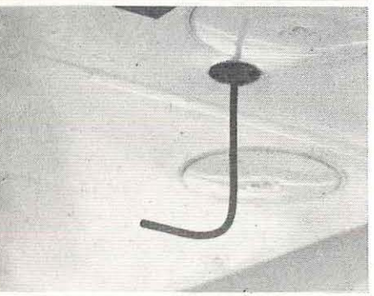
By this time it was getting quite dark. The pilot said he knew the wind was not very strong and as he didn't think there would be any other aircraft operating at this time, he decided to make a straight-in approach. He looked out for signals from the Tower but "only saw the red rotating beacon flashing". His only comment about entering the unserviceable area, was that he saw some markers and a tractor on his left as he taxied in, and the surface of the ground in this area was "a little rough."!!!

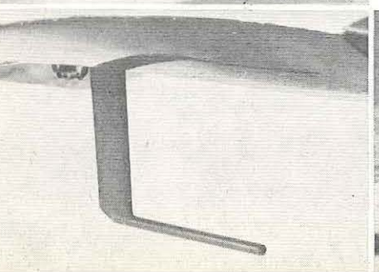
Were it not all true, such a hair-raising comedy of errors would be almost unbelievable of a person who had qualified for a pilot's licence. The thought of deliberately making an unauthorized straight-in approach to a busy airport in poor visibility is staggering enough. How a pilot could then nonchalantly dismiss red light signals from the Tower as nothing more than "the rotating beacon flashing", almost defies comprehension. And on top of this, even the cone markers, the presence of the tractor (hardly standard equipment on aerodrome movement areas) and the "rough" condition of the surface apparently did not penetrate.

Other airspace users may take comfort from the fact that the pilot concerned in this incident has not been exercising the privileges of his licence for some time.









Airspeed Indicators and PITOT COVERS . . .

Like all mechanical devices, airspeed indicator systems can be a source of potential trouble if they are not properly maintained.

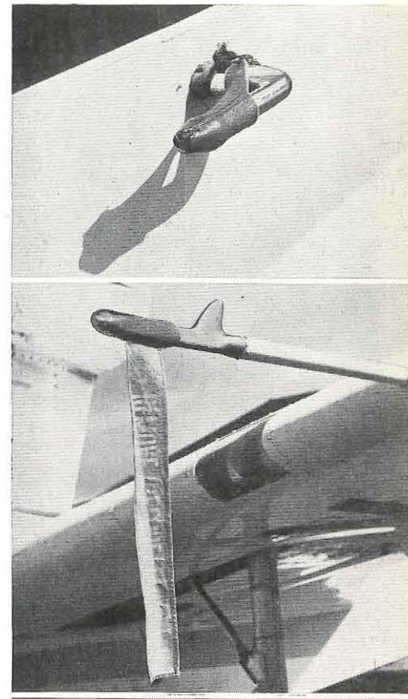
Pitot tubes particularly, need to be watched carefully. By their very nature, they are ideal for collecting water, insects and other small foreign matter. Indeed, some insects such as wasps and hornets seem to find the insides of pitot tubes almost irresistible as a secluded spot in which to build a nest! A blocked pitot head will naturally result in the airspeed indicator in the cockpit being seriously in error or even non-existent. For this reason, it is always desirable to install a close fitting pitot cover whenever the aircraft is left unattended for any length of time, particularly in the open or overnight. (See "Wasps Again", Page 22.)

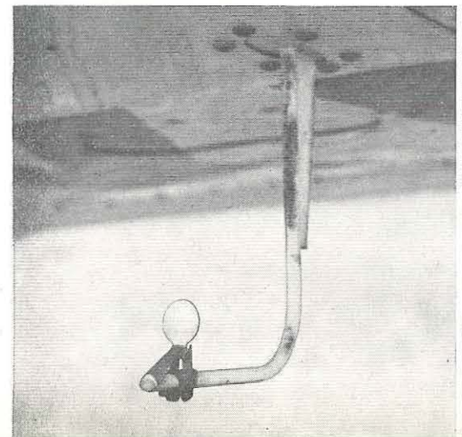
The pitot cover itself, can also be a potential hazard — it can be overlooked and left in place on the pitot tube, and the sudden realization on becoming airborne that one has forgotten to remove the pitot cover, can be extremely disconcerting! A pitot cover that is fabricated from red coloured material or has long coloured streamers attached to it, is less likely to be overlooked. Some pilots have tackled the problem by making a physical sighting of the pitot cover (when being stowed in the cockpit, or in the pilot's pocket), an item in the pre-take off check list. Various measures of these sort have been reasonably successful, and rarely now does an aircraft leave the ground with its pitot cover still firmly in place.

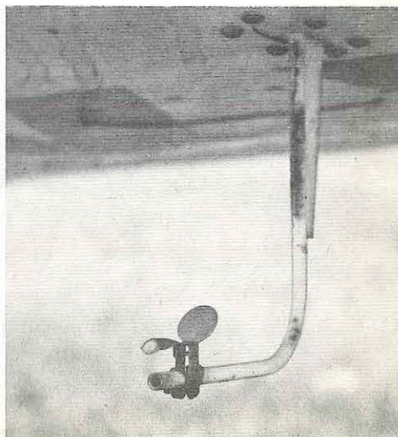
For all that, the removal of the pitot cover is just one more item for pilots to remember, and a good deal of thought has been expended in developing a simple, automatically-operated, mechanical pitot cover for light aircraft, which is opened by dynamic pressure as the aircraft accelerates to flying speed during take-off. The mechanical pitot cover (see photographs) consists basically of a metal cap on the end of an arm, held in place by a pivot pin, so that when the aircraft is at rest the cap swings down into place over the open end of the pitot tube. Also attached to the arm, but on the opposite side of the pivot, is a flat plate exposed to the airflow. As the aircraft accelerates during take-off to a speed where the airspeed indicator will begin to register, dynamic pressure acting against the plate, moves it back, lifting the cap off the end of the pitot tube.

But even these contrivances, seemingly foolproof, and considered by some to be a great improvement on having to untie and remove a fabric pitot cover, have themselves been a source of trouble when they have failed to open as intended. On most types of automatic pitot covers, the cover cap itself has raised edges designed to slip over the outside surface of the tube to ensure the cap makes a snug fit. If the cover is not adjusted properly, it is possible for these raised edges to catch on the sides of the tube and prevent the cover opening. Any burrs on the pitot tube or on the metal cap, can also prevent the cover opening as it should. It follows that if the automatic pitot cover is bumped or knocked while the aircraft is on the ground, there is a strong possibility that it will be sufficiently out of adjustment to prevent it working properly. The important thing therefore, is to check the automatic pitot cover during pre-flight inspections, to see that it has not been damaged in any way and that it will open freely when moderate pressure is applied to the plate.

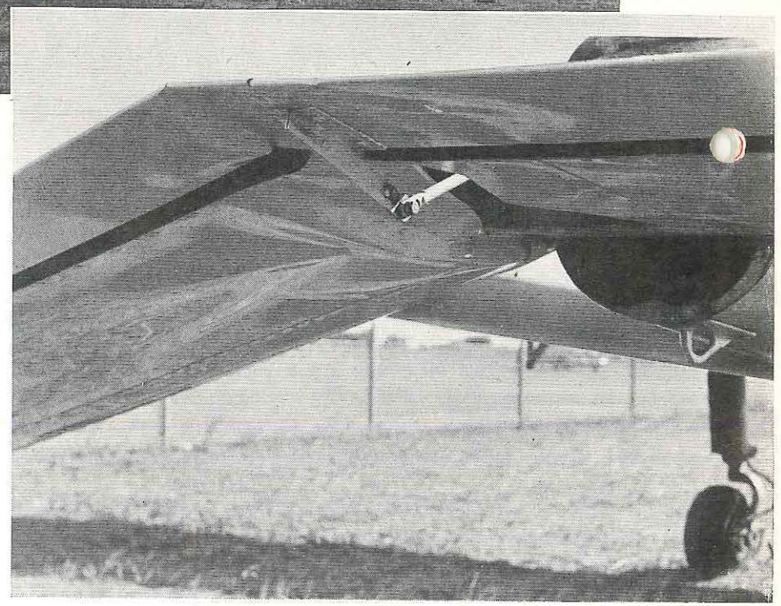
A final word of advice if you are unlucky enough to find yourself airborne with "nothing on the clock": Don't panic — just fly normally on attitude and power settings. Remember, you are not likely to stall if you have adequate power and the attitude of the aircraft is somewhere near right. Airspeed is a function of power and aircraft attitude, so at normal power settings and attitudes, the aircraft will fly at normal airspeeds, whether or not the airspeed is being indicated on a dial. Your approach to land may be a little faster than usual but again, don't worry — just make sure you have plenty of runway in front of you and ease the power off as you flare out. Don't try and force the aircraft on to the ground — hold it off in the usual way and allow it to settle. You may well find your emergency landing turns out a "greaser"!







Automatically opening mechanical pitot cover as fitted to Mooney aircraft.
Left: Cover closed.
Right: Cover open as in flight. Note the flat plate exposed to the airflow, deflection of which lifts the cover off the front of the pitot tube.



Don't bend it . . !

How often we hear this advice being given facetiously to club pilots taking aircraft out for a period of flying practice. But that's exactly what the pilot of this Musketeer did. In fact he came very close to doing much more than that. Just how close is little short of amazing.

The pilot, who is also the owner of the aeroplane, was flying from his grazing property to a nearby coastal town in Victoria, a distance of about 40 miles. The day was fine and clear with good visibility, but approaching the town at 1,500 feet, the pilot saw that a layer of broken cumulus cloud, with a base of about 800 feet, was lying over and beyond the town.

Uncertain now if he would be able to reach the aerodrome, which is on the far side of the town, the pilot throttled back to about 1,900 r.p.m. to reduce speed to 80 knots, lowered 15 degrees of flap and began to pick his way through gaps in the cloud bank. Over the town itself, he realized he would not be able to find a clear path through the cloud, and began to turn to port on to a reciprocal heading. Before he could complete the turn however, his aircraft plunged into the bank of cumulus, and with only two hours instrument experience, his troubles began in earnest.

At first, although he could see by the artificial horizon, as well as from occasional glimpses of the ground through gaps in the cloud, that the aircraft was still banked, he did not seem able to take off the bank to port. Then the cloud closed in completely and the aircraft seemed to enter a spiral dive, shallow at first, but steepening as it "wound up". The pilot became thoroughly disoriented but he interpreted from the artificial horizon that the aircraft was in a steep dive — the instrument was giving an indication that he had never experienced before, with the horizon bar right at the top of the dial — and he sensed that the aircraft was turning rapidly. He did not make any attempt to recover however, because he could not interpret what directional correction to apply.

The airspeed increased at an alarming rate as the spiral steepened, and the aircraft emerged from the base of the cloud in a high speed, near vertical dive. As soon as he caught sight of the ground again, the pilot hauled back hard on the control column, at the same time applying harsh opposite rudder and aileron to stop the spiral. The stall warning blew as the aircraft recovered violently from the dive, only 600 feet above the ground. At the same time, the control column suddenly became very stiff to move, the aircraft developed a strong tendency to yaw to the right, and it seemed to become unstable in the pitching plane.

The pilot nursed the aircraft to the aerodrome, lined up with the runway and made an approach to land. As he tried to flare for landing, he found the elevator was jamming and he could not raise the nose to place the aircraft in a landing attitude. He opened the throttle, went round again and made another approach. This time, by judiciously manipulating the throttle, he managed a successful landing. After the pilot had taxied in and switched off, he climbed out of the aircraft and found that the port tailplane was bent downwards some 20 degrees.

On Musketeer aircraft, the entire tailplane is moveable and acts as an elevator surface. Inspection of the aircraft showed that both horizontal tail surfaces had been subjected to a downward load. The port tailplane had moved forward as it had bent downwards, forcing its inboard edge against the side of fuselage, thus restricting its movement as an elevator. In being bent downwards almost 20 degrees, the upper surface of the port tailplane was wrinkled and strained and the lower skin severely buckled and distorted. The upper and lower surfaces of the starboard tailplane, though not so obviously damaged, had also been wrinkled and buckled in a similar but less severe manner.

It requires no great technical knowledge to see that the tail surfaces of this aircraft came unbelievably close to failing completely. Obviously the high speed developed in the spiral dive, combined with heavy control forces which the pilot applied at a high rate, had imposed a load on the structure well beyond its design strength. The stall warning blowing during the recovery was of course indicative of a high speed stall.

During an interview afterwards, the pilot admitted he had been in a panic when the aircraft was diving in the cloud and had pulled the aircraft violently out of the dive with "just about full back stick," as soon as he saw the ground again. Clearly, very little more force during the recovery would have broken the tailplane off altogether.

The pilot said he entered the cloud quite unintentionally while he was trying to turn back. He realized now that he had left his avoiding action too late, but until the aircraft actually entered the cloud he had considered he was turning back in sufficient time to avoid it. When asked why he had lost so much height before recovering control, the pilot said he was completely disoriented until the aircraft dived out of the base of the cloud.

This is the only time we have had the privilege of reporting a "disoriented in cloud" accident with a happy ending, albeit only just! We have reported numbers of others in earlier issues of the Digest but all of these had endings of only one sort. Notwithstanding the happy ending in this case, the lesson remains the same: **To fly into cloud without proper instrument qualifications is to court disaster.**

Wheel failure — poor maintenance ?

A Beech Queen Air, under charter to an oil exploration company, was making a flight from Warburton Mission, in the Warburton Ranges of Western Australia, to an oil drilling site in arid country some 50 miles to the south-east.

The aircraft, with one pilot and seven passengers on board, took off normally and the undercarriage retracted with no sign of difficulty. Forty minutes later the aircraft reached the circuit area of the drilling site after an uncomfortable flight in extremely hot, turbulent conditions. The pilot called Meekatharra Communications Unit, cancelled his SAR watch and began his pre-landing checks.

On selecting the undercarriage down, the red "up" warning lights went out, but there was no sound from the undercarriage electric motor, and the green "down" lights did not come on. The pilot selected the undercarriage lever up again but there was no response. After checking the circuit breakers and finding them normal, the pilot called Meekatharra again and advised them of the emergency.

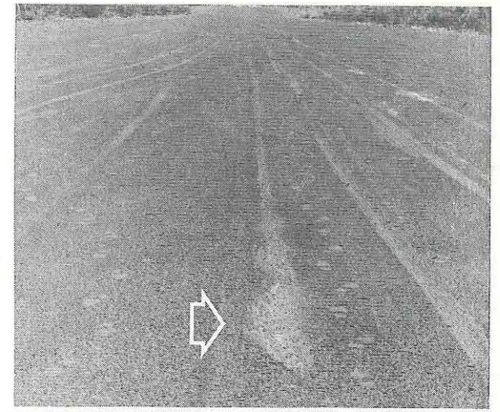
The pilot made several more unsuccessful attempts to lower the undercarriage electrically, then resorted to the emergency extension system. After about ten strokes of the emergency handle, the green "down" lights came on for the starboard and nose wheel only. The pilot continued to work the emergency extension system until it would go no further, but still there was no "green" for the port landing wheel, and he found the undercarriage warning horn blew when he retarded the port throttle.

Unable now to either raise or lower the undercarriage, the pilot had no alternative but to attempt a landing. He advised Meekatharra of the situation, briefed the passengers on the possibility of the port undercarriage collapsing on landing, and instructed them to evacuate the aircraft as soon as it came to rest.

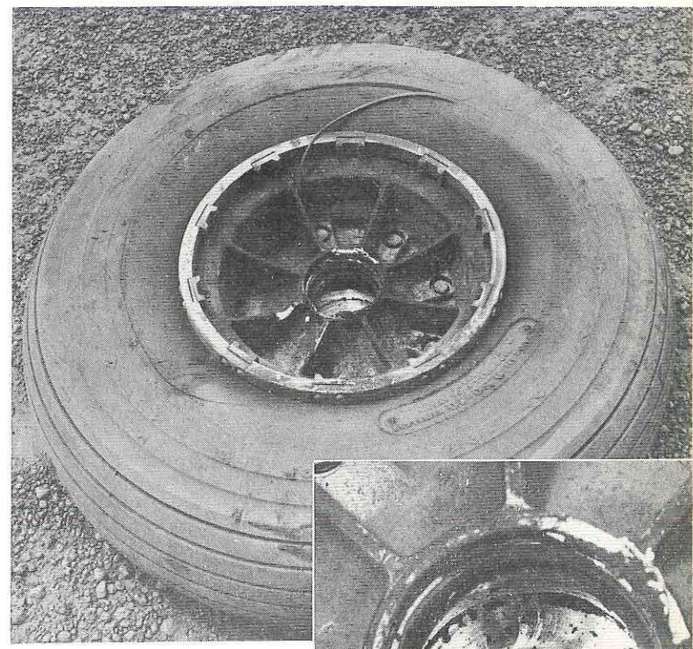
His preparations completed, the pilot aligned the aircraft with the runway and made a normal approach at 85 knots, touching down first on the starboard wheel. When the aircraft had definitely settled, he turned off the fuel and all switches and pulled the mixture controls into idle cut-off. The port wheel made contact with the ground as the aircraft slowed and immediately there was a severe vibration throughout the aircraft. No braking effort could be obtained from the port wheel and as the landing run continued towards the end of the strip, the pilot had no choice but to apply starboard wheel braking to avoid overrunning the strip. The aircraft began to swing to starboard as he did so, and the port wheel came off altogether. The port undercarriage dug into the ground, and the aircraft ground looped violently to port and came to rest. The passengers and the pilot were uninjured and the aircraft did not catch fire.

Inspection of the failed wheel assembly, showed that the wheel retaining nut was still in place and locked on the stub axle. The wheel bearings had failed and broken up, allowing the wheel itself to ride over the retaining nut and become detached from the axle. The ground loop had torn off the port undercarriage leg damaging the adjacent wing structure. The port propeller, the flap and the outer section of the port wing had also been damaged when they struck the ground.

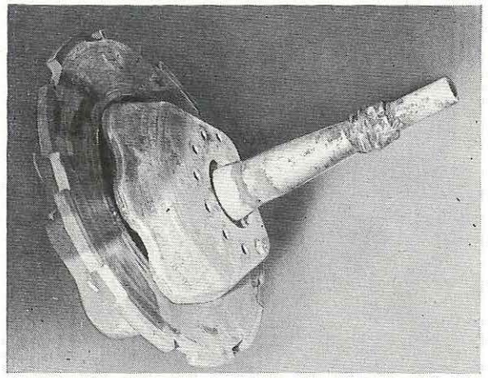
An examination of the aircraft's initial touchdown marks, and the track left by the wheels on the gravel surface of the strip, showed clearly that the port wheel was running erratically when the aircraft landed. Parts of the wheel's inner bearing were found on the ground near the aircraft. There was no trace anywhere on the airstrip of parts of the outer wheel bearing, and it was apparent that this bearing had failed while the aircraft was taking off from Warburton Mission. This was confirmed later when a search of the Warburton Mission airstrip found several bearing rollers and broken pieces of the outer bearing cage. Further examination of the aircraft, revealed that the port landing wheel had been out of alignment when it was retracted on take-off from Warburton and that it had struck the engine nacelle with some force. This had evidently disrupted the setting of the micro-switches



The track left by the port landing wheel as it touched down, clearly shows the erratic movement of the wheel on the axle.



The port landing wheel showing metal gouged from the centre of the hub as the wheel rode out over the retaining nut, after the bearings had failed.



The stub axle after being removed from the aircraft showing the wheel retaining nut and split pin still in place.

controlling the operation of the undercarriage retraction motor and the undercarriage position indicators. Despite the fact that the port undercarriage indicator did not show "down" before the aircraft landed, it was established that the port undercarriage was fully down and locked and that the accident resulted entirely from the failure of the port wheel assembly. Braking action on the port wheel was lost when the wheel moved out on the stub axle, separating the hub from the brake disc.

The reason for the failure of the port wheel assembly was investigated in detail. The damaged wheel and the remains of the bearing assemblies were closely examined. An inspection was also made of the aircraft's starboard wheel assembly. Both main wheels had been removed for inspection and greasing during 100 hourly maintenance only 37 flying hours before the accident occurred, and an effort was made to determine whether any irregularities or deficiencies existed in the standard of this maintenance. The examination of the starboard wheel assembly brought to light two facts of significance:

- The wheel bearing seal, which is simply a felt washer in an alloy housing held in place by a spring clip, was ineffective. Its condition was such that it should have been replaced during the 100 hourly maintenance inspection, and it had allowed dust to enter the outer bearing cage and build up on the bearing races.

- The split pin used to lock the castellated nut holding the wheel on the axle, was secured in the normal way, but it was long enough for one of the split pin legs to foul the alloy seal housing. This had circumferentially gouged a substantial amount of metal from the seal housing and the particles had found their way into the outer bearing cage.

At this stage of the investigation, it was quite clear that the detachment of the port wheel had resulted from failure of the outer wheel bearing, and efforts were concentrated on trying to determine the cause of the bearing failure. Three possibilities were considered as factors which might have led to the failure:

- Failure of the bearing cage or rollers, originating from some defect.

- Entry of dust to the bearing through use of a worn bearing seal.

- Metal contamination of the bearing as a result of the split pin leg fouling the bearing seal housing.

The first possibility could not be disregarded completely, although inspections of other aircraft of the same type, failed to reveal any evidence to support it.

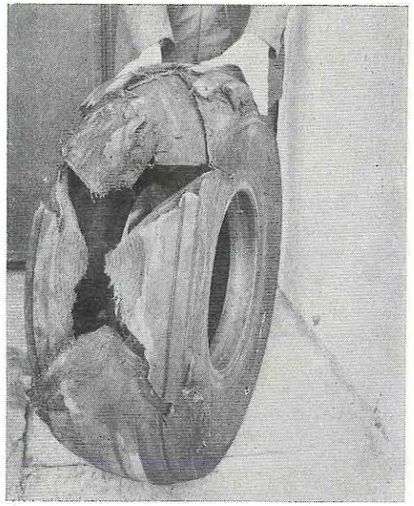
Similarly, because the port bearing seal was not recovered, it was not possible to determine whether the other two factors as existing in the starboard wheel, had existed in the port wheel assembly. Nevertheless, the possibility that the condition of the port wheel assembly had contributed to the failure of the bearing, could not be excluded.

Although it was not possible to state that the accident which resulted from failure of the port wheel bearing was attributable to inadequate maintenance, the evidence of the starboard wheel assembly clearly indicated that insufficient attention was paid to detail during servicing at the last inspection; firstly, in not replacing the worn bearing seal with a new one and secondly, in not ensuring that the split pin used to secure the wheel nut was correctly positioned, free from any possible interference with moving parts.

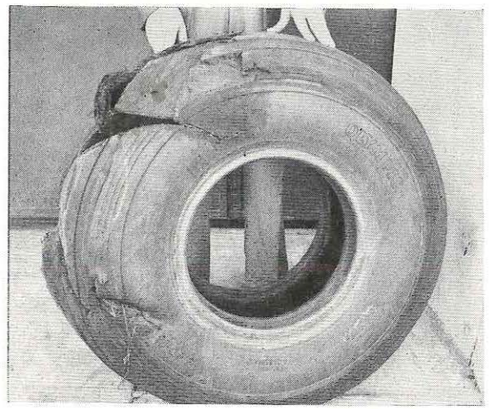
Electra takes off... ...with blown tyre

At Mangalore, Victoria, the port outer tyre of a Lockheed Electra blew out as the aircraft was landing during a period of flying training

The Electra was under the command of a company check captain and with another pilot at the controls, was making a landing with both port engines throttled back to flight idle. After turning 180 degrees at the end of the landing run and taxi-ing back along the runway, the pilot-in-command noticed a persistent, regular vibration as though the aircraft was running over a corrugated surface. When the vibration continued, the pilot attributed it to either a faulty undercarriage strut or a damaged tyre and asked the flight engineer to inspect the landing wheels from the passenger cabin windows. The flight engineer did so and reported the port outer tyre was badly damaged.



As the aircraft reached the end of the runway and turned to line up for another take-off, it was intercepted by an airport fire tender and the fire crew pointed to the blown tyre. As Mangalore Tower was not manned at the time, the fire crew passed a message to the aircraft through Melbourne Air Traffic Control, that they had seen the tyre blow during the landing run. From the cockpit window, the captain gave the fire crew a "thumbs up" to signify he knew of the faulty tyre, then advised Melbourne that as the other tyre on the port side was a new one, he would take off and return to Melbourne. The undercarriage was to be left extended during the homeward flight.



During the take-off, the vibration increased so much that it became obvious to the captain that the tyre was very severely damaged, and on inspecting it himself from the cabin after the aircraft was airborne, the captain saw that it was almost shredded. The aircraft continued to Melbourne and made an uneventful landing, and after the blown tyre had been replaced and minor damage to one of the port undercarriage doors, repaired, the aircraft was returned to service.

The captain's decision to return from Mangalore to Melbourne without first having the damage to the tyre properly assessed and the adjacent airframe components inspected by an engineer, was viewed most seriously by both his company and the Department. Indeed, it almost borders on foolhardiness. Not only was there a risk of blowing the other port tyre on take-off or during the subsequent landing, with a potential for very serious consequences; there was also the possibility that the blown-out tyre could have thrown off large pieces of tread and caused damage to the airframe itself, especially if pieces had been flung into a whirling propeller. As it was, the port outer undercarriage door had sustained minor damage, and the captain was not to know that this damage was not more serious.

The captain said that, before taking off, he believed the damage to the tyre consisted of no more than a loss of some tread. He had treated the fire crew's warning with some reserve because, on a previous occasion, they had advised him of a blown tyre, when in fact only the tread had been shed. But even if this had been the case, it would still have been most unwise to unecessarily commit the aircraft to a landing on a damaged tyre — the danger from flying pieces of tread could be just as great as with a blown-out tyre. The aircraft was due back at Melbourne 50 minutes after the blow-out occurred to make a scheduled flight to Sydney. The captain denied that this had affected his decision, but it would be surprising if this had not at least unconsciously influenced him to take a chance on the tyre.

Taking chances of any sort has no place in the aviation industry, and such lapses are least to be expected of a pilot charged with the responsibility for ensuring the competence of more junior and less experienced airline captains. The check captain concerned, who has a most impressive record and many years of airline flying behind him, has learned an important lesson in the hard school of experience and will no doubt be an even better check captain in the future. For the rest of us, the real value of the lesson is that even the most experienced and qualified are not exempt from the temptation to short-circuit normal safety precautions when the pressure is on, especially when there seems every chance of "getting away with it." It is for this reason that we think the story is worth passing on.

WASPS AGAIN

Readers may recall that in our September issue (Aviation Safety Digest No. 47) we published a photograph of a Cessna fuel tank that had collapsed in flight because wasps had built a mud nest in the air vent line.

From Darwin we have since received six more reports of wasps causing trouble. In each of these instances, wasps had built nests in the pitot tubes of the light aircraft involved, with the result that there was "nothing on the clock" when the aircraft took off, and the pilots had the ordeal of an approach and landing without an airspeed indication. In one case, the wasps had even found their way inside a loose fitting pitot cover to achieve their purpose.

The problem is most critical in tropical areas in the wasp nesting months of April, May and June, and clearly its only remedy is to attach a tightly fitting pitot cover after each and every flight. These are the months when numbers of pilots from the southern states make flights into the tropical areas of Australia, so if this includes you, be prepared!

One more point. Never forget to remove the pitot cover during your pre-flight inspections. You are only substituting one obstruction for another if you use a pitot cover and then depart with it still in place! A warning streamer attached to the cover will help you not to miss it. (See also "Airspeed Indicators and Pitot Covers", pages 14 and 15.)

from the INCIDENT FILES

Incident Reports are a rich source of air safety information and can benefit all who are involved with the operation of aircraft. Why not share YOUR knowledge and experience through the incident system?

A Near Miss

A Kingfisher glider was being winch-launched from Whitwarta aerodrome, South Australia, when a light aircraft, probably a Cherokee, flew over the field. The aircraft altered course slightly and dived as it approached close to the glider, but the glider pilot did not see the aircraft until it had passed.

The chief flying instructor of the gliding club was at the winch, supervising the launching, when he sighted the aircraft and could not at first tell whether it was above or below the glider. Seeing that the aircraft was approaching from behind and to port of the glider, however, and knowing the glider pilot would release the launching cable and begin a turn to the left immediately the winch was stopped, the instructor decided to continue with the launching. The aircraft missed the glider by less than 50 feet.

It was not possible to read the registration of the aircraft and its identity could not subsequently be established. The moral of the incident, however, remains clear. Pilots of aircraft operating outside controlled airspace under Visual Flight Rules, must, of course, be on the alert for other aircraft at all times, but especially at places where glider winch launching operations are the subject of a Notam or are indicated by the dagger symbol ‡ in red on Visual Enroute Charts and Radio Navigation Charts.

Cross Purposes

While taking off from Perth, W.A., the captain of an airline DC3 noticed that the port engine manifold pressure needle was responding to the starboard throttle and the starboard needle to the port throttle. The pilot abandoned the take off and made further engine checks. When he moved the manifold pressure gauge selector switch to the "opposite engine" position, he found the manifold pressure indicators operated in the correct sense.

The manifold pressure gauge installation was inspected and the hoses linking the engines to the instrument were found cross-connected. The aircraft had undergone a scheduled inspection immediately before the flight, in the course of which the hoses would have been removed from the gauge and blown through. The hoses had been re-installed and the work certified by an appropriately licenced engineer. As well as installing the hoses incorrectly, the engineer also failed to see that a functional test of the manifold pressure gauge was performed as required by the Company's engineering manual. The fault was not detected during a ground run of the engines at the completion of the inspection or while the crew were starting the engines and taxi-ing out for take off.

Another case of a skimped, non-standard inspection resulting in defective maintenance!

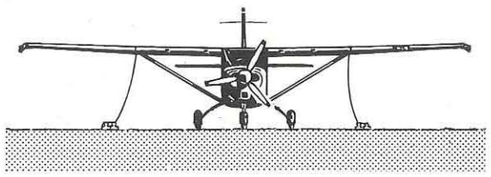
INADEQUATE PRE-FLIGHT INSPECTION

Shortly after first light, a Cessna 206 took off from Mawbray Creek, S.A., to fly to Port Augusta. The flight was uneventful but after the pilot had landed and taxied in, it was pointed out to him that the outer section of the starboard wing was damaged. About 18 inches of the leading edge, inboard from the wing tip, was dented and cracked, and the fibre glass wing tip was also cracked. The pilot immediately declared the aircraft unserviceable and the damage was reported to the Department. It was subsequently found that the starboard tailplane and the tail cone had also sustained minor damage.

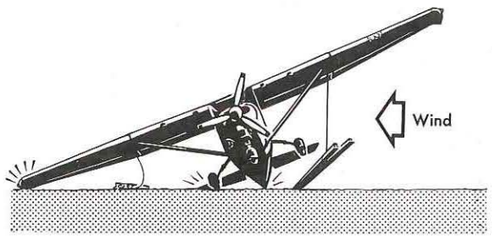
The pilot had flown the aircraft to Mawbray Creek the day before and had remained there overnight. Strong north-westerly winds were blowing at the time and he had tied the aircraft down, facing into wind, to some six feet lengths of railway line which were available at the site. The wing ropes were each secured to two lengths of the railway line and the tail rope to one length. The pilot remained with the aircraft throughout the day, but as it rode out the high winds without any sign of trouble, he thought it would be safe to leave overnight. During the night, however, a violent squall associated with the trough line producing the high winds, passed through the area, and the wind backed suddenly to the east-south-east without abating in strength. Despite the fact that the aircraft was secured to such heavy anchorages, a gust lifted the port wing with the heavy lengths of steel tied to it, and the starboard wing and tailplane struck the ground.

The pilot, who held a private licence and had accumulated 120 hours flying experience, said that on the morning of the flight he had returned alone to airstrip at 0430, about half an hour before first light. He did not have a torch with him but the aircraft seemed much as he had left it. He inspected the wheels and nose strut, checked the oil, and made a cursory inspection of the aircraft generally. All appeared to be well, so he untied the ropes, climbed in, and started the engine. After warming up, he carried out a normal run-up and cockpit check, and took off as soon as it was daylight.

Although the pilot "got away with it" this time, the incident vividly demonstrates how important it is to carry out proper pre-flight inspections, especially after aircraft have been left unattended in the open. It requires little effort to imagine what might have happened if the wing damage had not been so minor.



Aircraft tied down into wind.



Wind backs without abating in strength, lifting port wing. Starboard wing tip and tailplane are forced on to the ground.

DON'T IGNORE WARNING LIGHTS

A Lockheed Electra was being started at Sydney Airport in the early hours of the morning for a ferry flight to Brisbane without passengers. After the doors had been closed, the crew noticed that the warning light for the forward fuselage door was still on. The crew asked one of the hostesses to check if the door was closed, and the hostess confirmed that it was. The flight engineer then checked that both doors were shut, but still the light remained on.

The captain advised the ground engineer conducting the start, but as both doors appeared to be properly secured, the flight was dispatched with the warning light on.

After the aircraft had taken off there was a "knocking" sound on the side of the fuselage, and on reaching 5,000 feet, a pressurization leak developed at the forward fuselage door. The aircraft returned to Sydney and landed.

When the aircraft was again inspected, a piece of old carpet, which had been used to protect the floor covering while the aircraft underwent maintenance and cleaning, was found protruding from the underside of the forward door. The protrusion had not been noticed in the early morning darkness when the aircraft was being dispatched.

It had been the operator's practice to leave these protective coverings in the aircraft, but as a result of the incident, ground staff have been instructed to in future remove the coverings from aircraft before they depart.

This particular case may be an isolated one, but it aptly illustrates the risk inherent in ignoring door warning lights. Some years ago in the United States, a similar incident led to a fatality. (See Aviation Safety Digest No. 35, September, 1963). The rear service door of a Convair 440 developed a pressurization leak in flight. As the aircraft was descending through 4,000 feet towards the airport, the door was blown out and an explosive decompression occurred in the pressurized fuselage. A hostess who was working in the galley was ejected through the service door and fell to her death.

Door warning lights are there for a purpose. Don't discredit them because a door "looks all right."

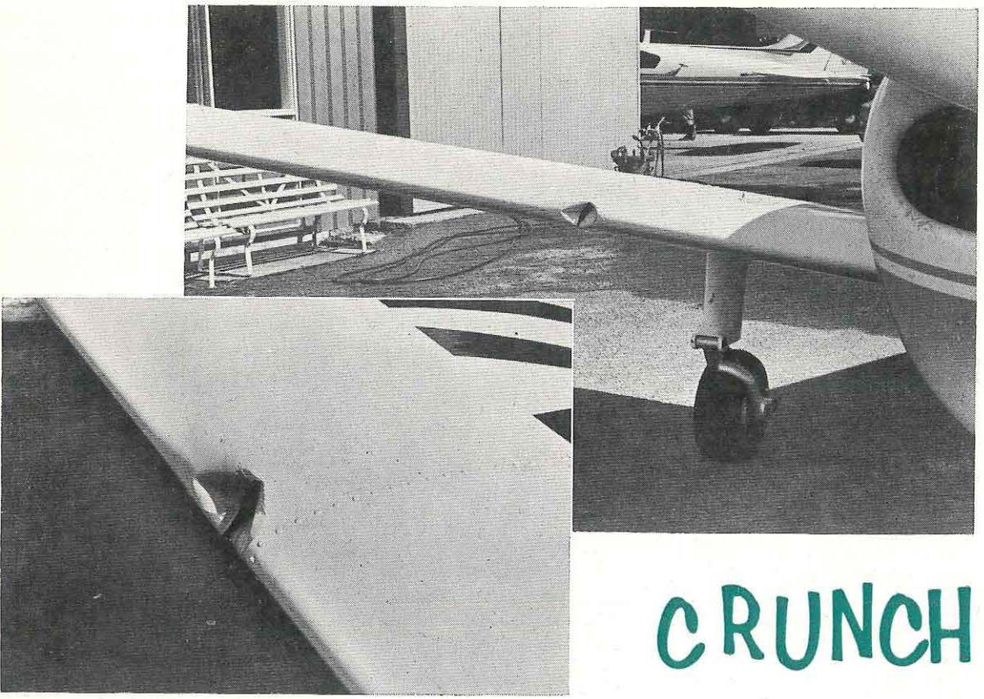
BIRD PROBLEM WITH A DIFFERENCE

Just after a Piaggio 166 had taken off from Kerang, Victoria, the starboard engine lost power. The pilot returned and landed.

Inspection of the engine revealed that a birds' nest was lodged inside the square sectioned carburettor air intake duct. The obstruction had reduced the flow of ram air and caused a loss of power at large throttle openings. How the birds had gained access to the interior of the duct at first seemed a mystery as both the ram air and hot air intakes are fitted with wire gauze screens. The only other openings into the carburettor air intake duct are two emergency air intakes installed in the walls of the duct. These emergency intakes are rectangular in shape and are each fitted with an inward opening flap, spring-loaded to remain closed in normal operation. The tension on the springs is such that if an accumulation of ice obstructs the ram air intake, engine suction will open the flaps and admit sufficient air to supply the engine.

Somehow, the birds had found that the spring loaded flaps gave the entry to the inside of the duct, possibly when one of the flaps was opened momentarily by a gust of wind while the aircraft was parked in the open. Once inside the duct, the birds' only means of escape would have been to prize open the flap with their beaks. This the birds had obviously learned to do and had taken advantage of their discovery as a place to build their nest.

It was some days after the nest was removed from the duct that this solution presented itself to the operator, and he immediately checked the engine ducts again to see if the birds had returned in the meantime. Sure enough, there was another nest partly completed in the same position as before! The operator had since made a practice of blocking off both ends of the engine nacelles when the aircraft is not being used.



CRUNCH . . !

The damage to the aircraft shown in these photographs was caused by a station waggon that was being driven on the apron by an aircraft refuelling attendant. The attendant had just seated himself behind the wheel of the vehicle to drive away, when someone hailed him. To speak to the person without getting out again, the attendant started the engine, and without so much as a glance behind, reversed his vehicle. As he did so, one of the "tail fins" of the station waggon collided with the starboard wing of the light aircraft parked nearby, denting and tearing the leading edge.

Aircraft structures are easily damaged and expensive to repair. Be especially careful if you are required to drive a vehicle in the vicinity of parked aircraft.

A COSTLY FIND

When a Piaggo 166 returned to Brisbane Airport after completing a regular public transport flight to Wondai and Kingaroy, Queensland, it was found that two blades of the starboard propeller had been severely damaged. Cuts in the leading edge of the blades a quarter of an inch deep, had obviously been caused by impact with a hard metal object.

A search was made of the three aerodromes and on the following day, two pieces of a pair of side cutters were found lying in the grass at Brisbane Airport, adjacent to the apron area used by the aircraft.

The tool had no identification markings and, needless to say, its owner could not be found.

SUPPLY DROP LEADS TO LOSS OF CONTROL

A Dakota, carrying a crew of eight, was engaged in dropping supplies in inaccessible terrain. During the operation, one package of freight containing sleeping bags became lodged against the tail of the aircraft. Efforts by the crew to free it were unsuccessful and at 1230 hours local time, the aircraft advised its base of the situation and that it was returning with its load. Five minutes later, when the aircraft was 50 miles from its base at 7,000 feet, the captain declared an emergency, reporting that one sleeping bag had become jammed under the tailplane and elevator and was inducing severe vibration. At 1248 hours he reported that all attempts to free the bag had failed and that the aircraft was getting out of control. At 1254 hours the aircraft commenced descent towards the aerodrome but four minutes later it transmitted a distress call, "Mayday, Mayday, Mayday, lost control", and dived vertically into the ground in thickly timbered, uninhabited country. All on board were killed.

Investigation established that the starboard wing and the tail assembly had separated from the aircraft before it struck the ground. The package containing the sleeping bags that had lodged against the tail weighed 70 lbs. and measured 46 in. x 32 in. x 20 in. It had struck the tailplane after being thrown from the aircraft and one sleeping bag had become jammed and had ballooned in the slipstream. The aircraft captain was highly experienced, having accumulated a total of 12,600 hours, of which nearly 9,000 had been on supply dropping operations.

The operator had experienced previous instances of freight bags becoming lodged on the tail of the aircraft, but in most cases the crew had been able to free the items with bamboo poles from the fuselage door. In a few cases this had proved unsuccessful and a landing had to be made before the freight bag could be dislodged, but on no previous occasion had an accident been caused. As a result of this accident, packages intended for air dropping by the operator are being limited in size in relation to their weight. Items to be ejected at one time are being tied together securely and every consignment is being inspected for security of packing. In addition, the operator is working to develop a more efficient system of dislodging packages, if despite all precautions, one should foul the tail of an aircraft while being air-dropped.

Air Safety Circular,
Ministry of Civil Aviation, India.

TRAINING AIRCRAFT COLLIDE AT RUNWAY INTERSECTION

In clear weather, an Aeronca and a Cessna 150, landing at an uncontrolled airport in Alabama, collided at the intersections of the airport's runways 18 and 11. The runways intersect relatively near their approach ends and the collision occurred as the pilot of the Cessna was about to

land on Runway 11 and the pilot of the Aeronca was initiating a missed approach from Runway 18. Both aircraft crashed and came to rest inverted on Runway 18 but neither pilot was injured seriously.

The pilot of the Cessna was returning from a cross-country flight and as the wind was 070 degrees 6 knots, he elected to land on Runway 11. At the same time, the pilot of the Aeronca was carrying out local flying and circuits and landings from Runway 18.

The pilot of the Cessna had been informed by the airport advisory service that the Aeronca was operating from Runway 18 and that it was not in radio contact. As the Cessna pilot turned on to final approach, he was again advised that the Aeronca was also on final approach for Runway 18. When he did not sight the Aeronca, the pilot of the Cessna continued his approach, thinking that the Aeronca would land after he had passed the intersection of the two runways. About 25 feet above the runway however, he saw the Aeronca flash in front of his aircraft and he immediately but unsuccessfully banked steeply to the left to try to avoid it.

The pilot of the Aeronca said that before the accident, he had been doing some local flying and then returned to the airport to practice circuits and landings on Runway 18. On his third landing approach, he side slipped the aircraft to lose height. As he prepared to land, he saw another aircraft on Runway 18 ahead of him and he decided to carry out a missed approach. Before he could apply power, his aircraft collided with the Cessna 150. The pilot said that although he had looked out for other aircraft in the circuit area, he had not seen the 150 at any time.

C.A.B. United States.

OIL SUMP PLUG LOST IN FLIGHT

At a refuelling stop in the course of a private cross country flight, a Beechcraft Bonanza was serviced with 25 gallons of fuel and 2 quarts of oil.

The aircraft departed normally to resume its flight but not long afterwards, it was seen approaching to land at a country airport further along the route being flown. Although the surface wind was from the south, the aircraft approached from the east and turned north to land on the northern runway. Witnesses said that the propeller was turning very slowly as the aircraft approached. The aircraft overshot and touched down well towards the far end of the runway, then bounced with great force into a power line beyond the runway and crashed. The pilot was very seriously injured and was not able to recall any of the events of the accident. His two passengers were both killed.

The pilot had seriously misjudged speed and distance during his forced landing approach. Investigation showed later that the touch-down point was only 355 feet from the far end of the 2,600 foot grass runway. The power lines into which it crashed where 20 feet high and 55 feet north of the airport boundary. An inspection of the engine showed that the oil sump drain plug was missing and that the sump drain plug access cover was not properly secured. Neither of these conditions could be attributed to impact forces, and the threads in the oil sump plug drain hole were in good condition. The engine inspection revealed that there was no oil in the oil lines. The number six cylinder connecting rod had also failed from oil starvation and other engine components showed extensive evidence of oil starvation. There were heavy oil smears at the bottom of the fuselage which indicated that the oil had been lost in flight.

The engine log book showed that immediately before the flight in which the accident occurred, the engine had undergone major repairs. When the work was completed 2½ gallons of oil, the oil capacity of the sump, had been added to the engine. The accident occurred three flying hours after the repairs had been completed. The oil starvation which lead to the accident had obviously resulted from an inadequate standard of maintenance in the workshop responsible for the repairs to the engine.

C.A.B. United States.