

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

Reference: CA18/3/2/9567

Aircraft Registration	ZS-CEA	Date of Accident	31 August 2016		Time of Accident	1352Z
Type of Aircraft	Raptor 582 Trike (Weight shift controlled aircraft)		Type of Operation	Private Part 24		
Pilot-in-command Licence Type	National Pilot licence	Age	41	Licence Valid	Yes	
Pilot-in-command Flying Experience	Total Flying Hours	110.41		Hours on Type	76.21	
Last point of departure	Panorama aerodrome: Gauteng province					
Next point of intended landing	Panorama aerodrome: Gauteng province					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Into a field, corners of Langkloof and Rogers in Alrode at GPS co-ordinates determined to be S26° 21' 13.1" E28° 06' 52.7" at about 5 150 feet above mean sea level (AMSL).						
Meteorological Information	Temperature, 22°C: Dew point, 02°C: Visibility, 10 km: Wind direction, North Easterly: Wind speed, 07 knots.					
Number of people on board	1 + 1	No. of people injured	1	No. of people killed	1	
Synopsis	<p>On Wednesday 31 August 2016, the pilot accompanied by the passenger was conducting a private flight from Panorama aerodrome situated south of Johannesburg when the accident occurred. The information gathered at Panorama during the investigation revealed that the pilot and the passenger reported at the aerodrome early in the morning upon which the pair unlocked the hangar and pushed ZU-CEA aircraft outside to the grass area. The weather condition in the area for the time leading up to the accident was consistent with visual meteorological conditions (VMC), unlimited visibility. Before departure the pilot completed a pre-flight inspection before boarding the aircraft. The aircraft took off without incident and headed towards Alrode industrial area, where it was later reported to have crashed. The pilot was fatally injured and the passenger sustained serious injuries. The aircraft was destroyed by post-impact. Accidents and incident investigation division (AIID) was notified and the investigators were promptly dispatched to the scene. In-depth examination of the wreckage and the engine did not identify defects. The investigation determined that the accident was as a result of poor decision making and lack of a sense of immediate danger.</p>					
Probable Cause						
Collision with the power lines/wire strike.						
Contributing factor/s:						
Failure to look out.						
IARC Date	17 January 2017	Release Date	02 February 2017			



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Muller M
Manufacturer : Aviate Products CC
Model : Raptor 582 Trike
Nationality : South African
Registration Marks : ZU-CEA
Place : Open field on the corners of Langkloof and Rogers in Alrode
Date : 31 August 2016
Time : 1352Z

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation:

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (2011) this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability**.*

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION:

1.1 History of Flight:

1.1.1 On Wednesday 31 August 2016, the pilot accompanied by a sixteen year old boy "passenger" was conducting a private flight from Panorama aerodrome situated south of Johannesburg when the accident occurred. The information gathered at Panorama during the investigation revealed that the pilot and the passenger reported at the aerodrome early in the morning upon which the pair unlocked the hangar and pushed ZU-CEA aircraft outside to the grass area. The weather condition in the area for the time leading up to the accident was consistent with visual meteorological conditions (VMC), unlimited visibility. Before departure the pilot completed a pre-flight inspection before boarding the aircraft. The aircraft took off uneventfully and headed towards Alrode industrial area, where it was later reported to have crashed. Accidents and incident investigation division (AIID) was notified and two investigators were promptly dispatched. Post-accident investigation revealed no communications with any air traffic services (ATS) during the flight. The investigators located the eye-witness who gave a brief description of what he saw. This witness reported that the aircraft approached from the site of the main road "southerly direction" behind the steel factory at roughly 10 feet (ft) above ground level (AGL), from which it struck a 60 ft Eskom high voltage power lines pylon with the right wing. The aircraft was destroyed.

- 1.1.2 According to the witness, the pilot appeared to have an intention to land on the open grass field, but was somewhat doubtful or unhappy with the condition of the field. The witness was unable to determine the speed the aircraft was travelling at, but from the information gathered, it was probable that the aircraft was travelling at about 65 miles per hour (m/ph), indicated air speed (IAS). A number of other people stopped nearby and two men made their way to the crash site. Neither of them had witnessed the crash, but as they approached the wreckage, one of these men reported seeing the passenger attempting to lift his head. He directly phoned 911 and the South African police service emergency number (10 111), from which Brackendowns police station and the Ekurhuleni emergency services was informed and dispatched. They arrived twenty minutes after the accident. On examination of the accident scene by the emergency personnel, the pilot was found to have succumbed to his injuries and was pronounced dead on the scene.
- 1.1.3 The passenger sustained serious injuries and required rapid advanced life support intervention. ER24 paramedics administered first aid to the passenger before rushing him to Union private hospital under the care of the emergency life support paramedics. The passenger went through multiple surgical procedures and was released two months later. On October 21, 2016, the investigator in charge (IIC) communicated with the mother to check if her son was fit to be cross-examined and the mother ordered the investigators to directly come to Alberton where her son was cared for. The mother requested if she could be present during the interview sitting as her son was still a minor, and the IIC allowed her. The passenger calmly at the comfort of his bed gave a brief explanation of what happened. According to his statement, the aircraft had about forty litres of unleaded fuel on-board. The pilot completed a pre-flight briefing from which the aircraft was started uneventfully. The pilot had on his lap two unsecured main wheel fairings which were to be delivered to a factory at Alrode for maintenance and installation on the main wheels.



(a)



(b)

Figures 1: Main wheel fairings found at the accident site. *NOTE: Both fairings did not have attachment points to allow fitment to the wheel axles. The picture on the right illustrates how the fairing looks when fitted

1.1.4 The passenger stated that before departure from Panorama, the pilot performed pre-departure checks and all appeared to be normal, from which the aircraft took off and climbed to roughly 800 ft AGL. The passenger stated that the engine ran normally throughout the flight and that it responded to the pilot's inputs. All was normal and they had a wonderful talk all the way as they were both wearing protective helmets which allowed intercom communication. As they drew closer to Alrode industrial site, the pilot identified an open field behind the steel factory, from which he trimmed the aircraft in preparation for landing, flying at about 10 meters AGL southerly. To his surprise, the pilot didn't land as intended. He instead took power and continued in the direction of the power lines upon which the aircraft struck the middle pylon with the right wing tip. The passenger stated that the pilot was aware of the power lines running from the east to the west in the area. The passenger recalls the pilot swearing after the encounter with the pylon from which the aircraft pitched down and crashed onto the ground. The last thing he remembers was waking up from hospital bed in severe pain. The power lines did not separate. The investigators tried to locate the area where the aircraft came into contact with the structure or power lines, but without success. Eskom was notified and the engineer was instantly dispatched. He thoroughly inspected the structure and the power lines and could not find any damage. The power did not trip which proves that there was no contact with the conductors.

1.1.5 The accident occurred during day light at GPS co-ordinates S26° 21' 13.1" E28° 06' 52.7" at an elevation of 5 150 feet above mean sea level (AMSL). Attached on figure 1 is Google Earth map showing the accident site.

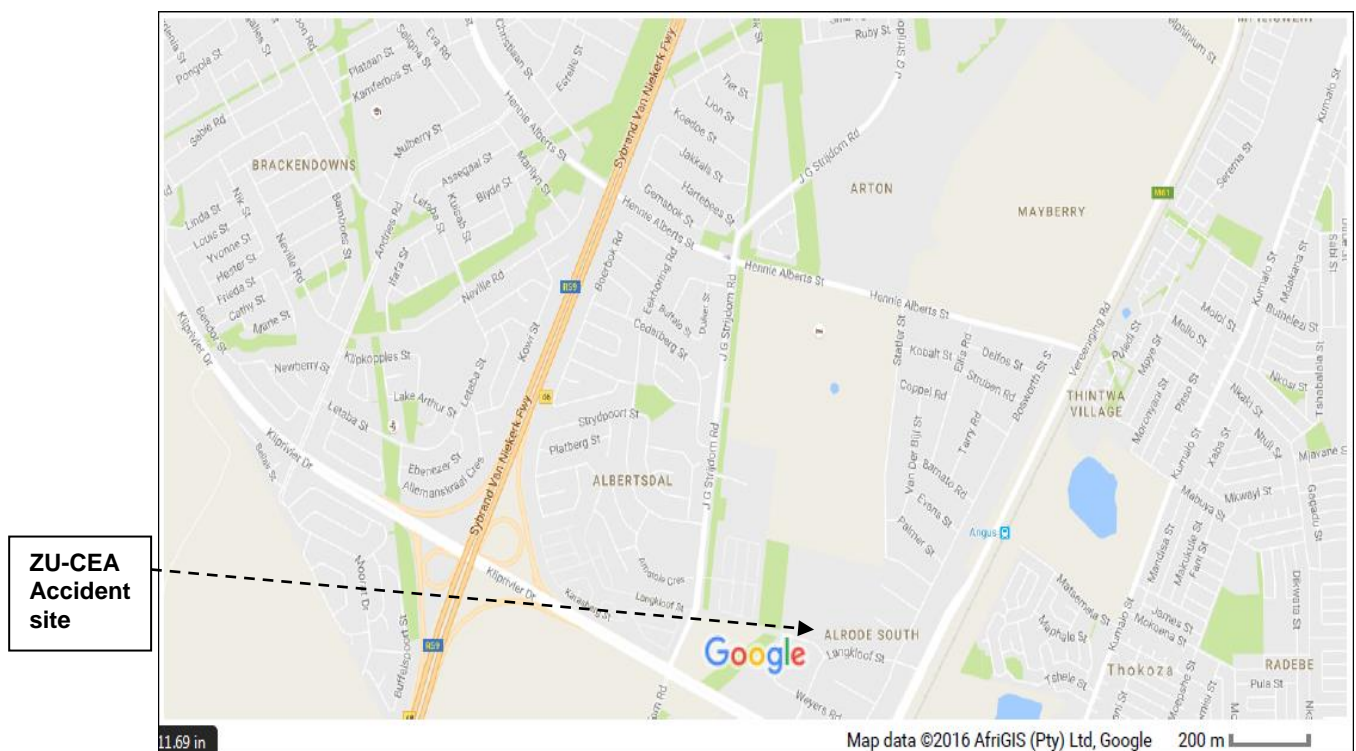


Figure 2: Google Earth area map showing the accident site

1.2 Injuries to Persons:

Injuries	Pilot	Crew	Pass.	Other
Fatal	1	-	-	-
Serious	-	-	1	-
Minor	-	-	-	-
None	-	-	-	-

1.3 Damage to Aircraft:

1.3.1 The aircraft was destroyed during the accident sequence.



Figure 3: ZU-CEA wreckage at the accident



Figure 4: The accident site showing the pylon the aircraft collided with

1.4 Other Damage:

1.4.1 No other damage was caused.

1.5 Personnel Information:

Nationality	South African	Gender	Male	Age	41
Licence Number	0279016810	Licence Type	National Pilot licence		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Nil				
Medical Expiry Date	30 September 2018				
Restrictions	None				
Previous Incidents	Nil				

Flying experience:

Total Hours	110.41
Total Past 90 Days	0
Total on Type Past 90 Days	0
Total on Type	76.21

*NOTE: The pilot, aged 41, was a South African citizen and has completed his flight training at Johannesburg flight academy in Panorama aerodrome. He held a National pilot's license (NPL) and also a medical certificate which was valid until the 30th of September 2018. His pilot's profile obtained from recreation aviation administration of South Africa (RAASA) showed no enforcement actions. His licence was valid and he only was rated on weight shift aircraft. His logbook had been endorsed by his flight instructor during his initial training, certifying that he had satisfactorily completed his training. On 24 April 2013 he obtained his national pilot license (NPL) and had logged 34.2 total flight hours. The last logbook entry showed that the pilot had accumulated a total of 110.41 flying hours, most of which was spent at the controls of ZU-CEA aircraft. According to the pilot's relatives, the pilot had flown the aircraft around Alrode on many occasions. The pilot had little recent flying experience logged. His logbook showed that he had not flown between 17 November 2015 and 30 August 2016.

1.6 **Aircraft Information:**

1.6.1 General description:

The Raptor 582 Trike is a two-seat, weight shift controlled flex-wing microlite aircraft manufactured by Aviate Products CC, South Africa. It consists of a wing, constructed of fabric and aluminum alloy tubing and braced by steel cables, and a 'trike' unit incorporating a tricycle landing gear, rear-mounted Rotax 582 air-cooled single ignition engine and seating for two occupants in tandem configuration. The aircraft is normally flown from the front seat. The pilot controls the aircraft via the 'A' frame, which comprises a horizontal base bar and two diagonal uprights attached to the hang bracket. Steel cables are attached between the ends of the base bar and the front and rear of the wing keel tube, so that moving the base bar fore and aft causes the wing to tilt up and down, changing the amount of lift produced. The aircraft is turned by moving the base bar to the left or right. The range of forward movement of the base bar and thus the degree of upward tilt of the wing was limited by the presence of the front strut. The geometry is such that even with the base bar fully forward and in contact with the front strut, the rear of the wing keel tube remains clear of the propeller arc. The engine

speed was controlled via a foot operated throttle pedal. A hand throttle on the left side of the trike allowed a constant throttle setting to be selected without the need to maintain pressure on the throttle pedal. The pilot can adjust the trimmed speed of the aircraft via a trim wheel on the right-hand 'A' frame diagonal upright. This varies the length of steel cables or 'luff lines' attached to the trailing edge of the wing, thus changing the wing's aerodynamic characteristics. The luff lines are routed through a group of pulleys attached to the top of the wing kingpost. The aircraft was made from steel tubing, with its double-surface Raptor 17 XP wing covered in Dacron sailcloth. Below is the Raptor aircraft.



Figure 5: Raptor-trike aircraft type

Airframe:

Type	Raptor 582 Trike	
Serial Number	AR00068	
Manufacturer	Aviate Products CC	
Maximum Gross weight	992 lb	
Empty weight	359 lb	
Date of Manufacture	2000	
Total Airframe Hours (At time of accident)	511 (Hobbs)	
Last Annual Inspection (Hours & Date)	472	04 April 2016
Total Hours Flown	39	
Authority to Fly (Issue Date)	31 May 2016	

Authority to Fly (Expiry Date)	03 April 2017
C of R (Issue Date) (Present owner)	21 April 2016
Fuel used	95 octane unleaded fuel
Operating Categories	NTCA Part 24

*NOTE: A review of the airframe and engine logbooks showed that detailed, up-to-date maintenance records were kept by the owner. There were no recorded outstanding maintenance items or defects at the time of the accident. The aircraft had been maintained in accordance with (IAW) Part 44 maintenance rules. The aircraft had a current certificate of registration (C of R) and authority to fly (ATF) certificate. The aircraft was maintained to a day visual flight rules (VFR) standard. The last annual inspection carried out on the aircraft prior to the accident was certified at 472 total flight time on 04 April 2016 by an approved person (AP) stamp No 027, under the AP scheme from the Aero Club of South Africa. According to the available information, the certificate of release of service lapses at 596 hours flight time or on April 2017.

Engine:

Type	Rotax 582
Serial Number	6025505
Hours since New	506.20
Hours since Overhaul	T B O Not reached

Propeller:

Type	Geo Killey
Serial Number	N/a
Hours since New	506.20
Hours since Overhaul	T B O not reached

*NOTE: The Rotax engine maintenance schedule was based on a 100 hour inspection interval unless the aircraft was operated in severe operating conditions when the time between maintenance was reduced. The aircraft logbook indicated that the engine was fitted to ZU-CEA airframe on the 05th of April 2012 at 158 total airframe hours.

During this maintenance, the card cable, the choke cable rubber seals as well as the magneto seal rubbers were replaced. On the 05th of October 2012, an annual inspection was carried out IAW the manufacturer's requirements at 418 total airframe hours, upon which the aircraft was released to service by an approved person (AP), stamp No 028. The aircraft's maintenance record was up to date and the next planned 100 hour service was due on April 2017. Scrutiny onto the flight folio showed that the aircraft was last flown on the 25th of October 2015 at 506.20 total airframe hours up until the 22nd of May 2016, when it again took up to the sky for an hour on a test flight.

Weight and balance calculation:

The aircraft's maximum all-up weight (MAUW) and its maximum take-off weight are both 450kg. The aircraft flight manual (AFM) recommends pilots to carry out calculations before each flight to ensure the MAUW is not exceeded. The pilot weight as per the medico-legal post-mortem report revealed that he weighed **67kg**. The passenger's weight was reported to be **95kg**. The helmets and headsets had a total weight of **3.4kg**. 40 liters of 95 unleaded octane fuel weighing **20kg** was added to the aircraft weight at the time of the accident, the aircraft weighed approximately **216.4kg**. The weight calculation showed that the value was within the normal operating range for aircraft usage at the time of the accident.

1.7 Meteorological Information:

1.7.1 Weather information as obtained from the South Africa weather services (SAWS):

(i) Satellite image:

The day natural colours satellite image below (Figure 5) valid for 1000Z shows clear skies in the interior of the country and low cloud along the west and south coast.

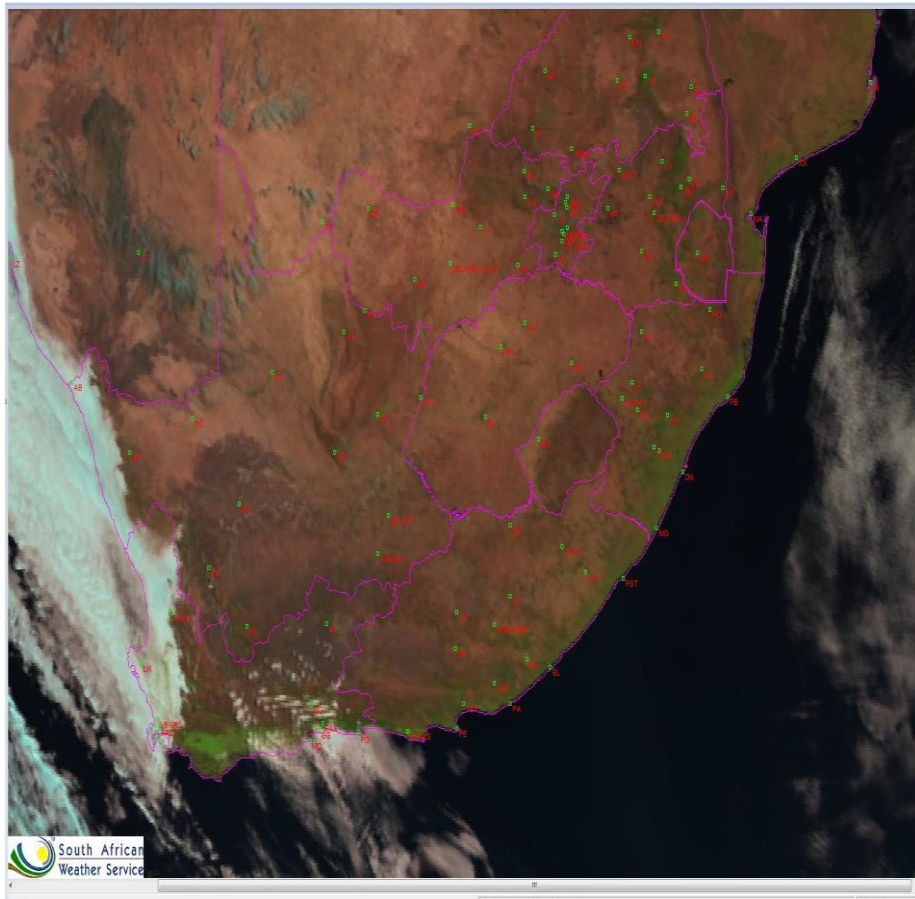


Figure 6: General overview of Gauteng at the approximate time leading to the accident

(ii) Surface data:

Surface data for O R Tambo International Airport was used as a closest station, situated less than 40 km from Alberton. The 1030Z METAR for FAOR gives the following:

Dry-bulb temperature: 22°C

Dew-point temperature: 02°C

Wind direction and speed: 02007KT

Weather and Clouds: CAVOK

Pressure reduced to mean sea level: 1029 hPa

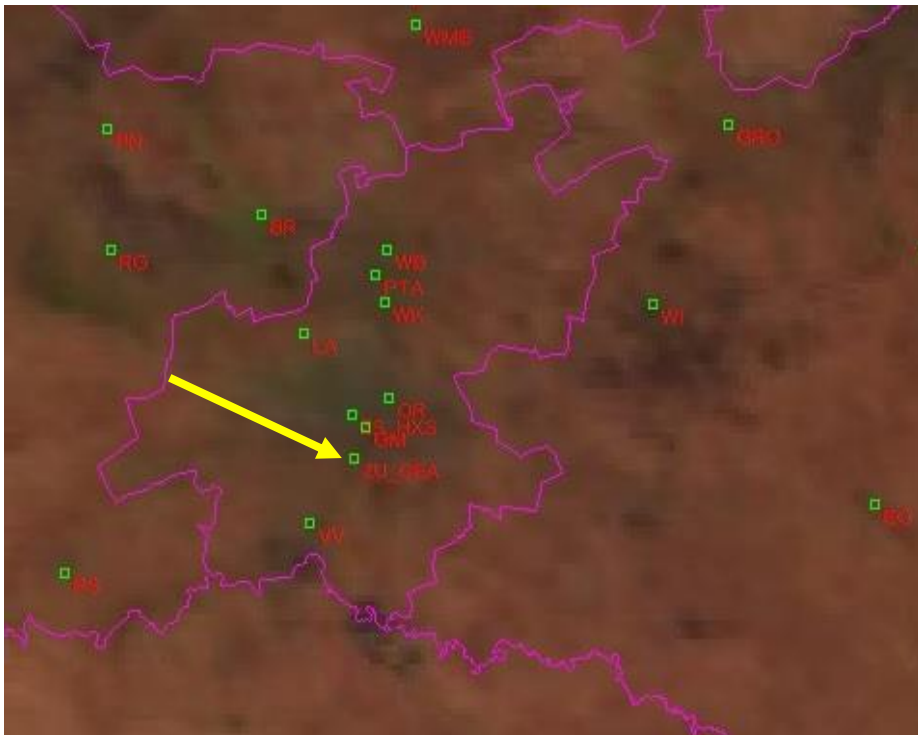


Figure 7: Weather condition at Alberton and the accident site

1.8 Aids to Navigation:

1.8.1 The aircraft was fitted with the Ultra XL MGL electronic flight instrument system (EFIS) device. The device presents primary flight data such as the pressure altitude, airspeed, vertical speed, glide slope as well as the engine monitoring data; i.e. the engine revolution per minute (RPM), exhaust temperatures and pressures as well as the fuel related information such as fuel levels and fuel flow rates. Attached below is the MGL avionics device and the display.



Figure 8: MGL avionics device installed on the aircraft/instrument panel

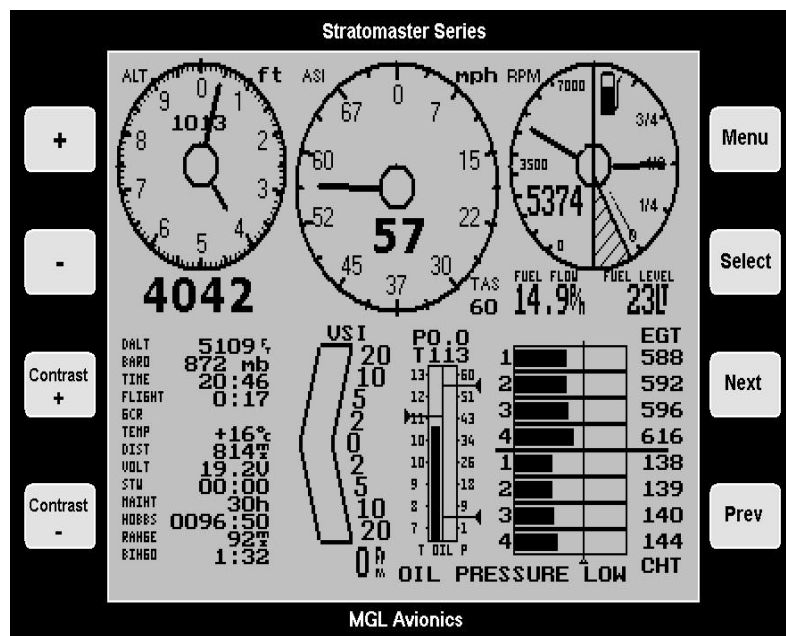


Figure 9: MGL avionics main display

1.9 Communications:

1.9.1 The aircraft was fitted with a very high frequency (VHF) transceiver. There was no recorded communication from the aircraft.

1.10 Aerodrome Information:

1.10.1 The accident occurred during day light at GPS co-ordinates S26° 21' 13.1" E28° 06' 52.7" at about 5 150 feet above mean sea level (AMSL).

1.11 Flight Recorders:

1.11.1 The aircraft was equipped with an MGL avionics EFIS ultra horizon system, with data recording capability. The EFIS was structurally intact. The liquid crystal display (LCD) was destroyed by impact (Figure 7). The unit was disassembled by the manufacturer, MGL avionics situated in Cape Town without difficulty. Investigation of the electronics assembly showed no physical damage. This EFIS system type record a flight folio style flight log automatically. It however does not have a facility to record **actual** flight other than maximum speeds and altitudes obtained during flight. The display was replaced with a new one. The keypad had suffered some damage and was also replaced. The system was then powered and operated normally allowing access to the flight log. Below is the photograph displaying the last entries of the flight.

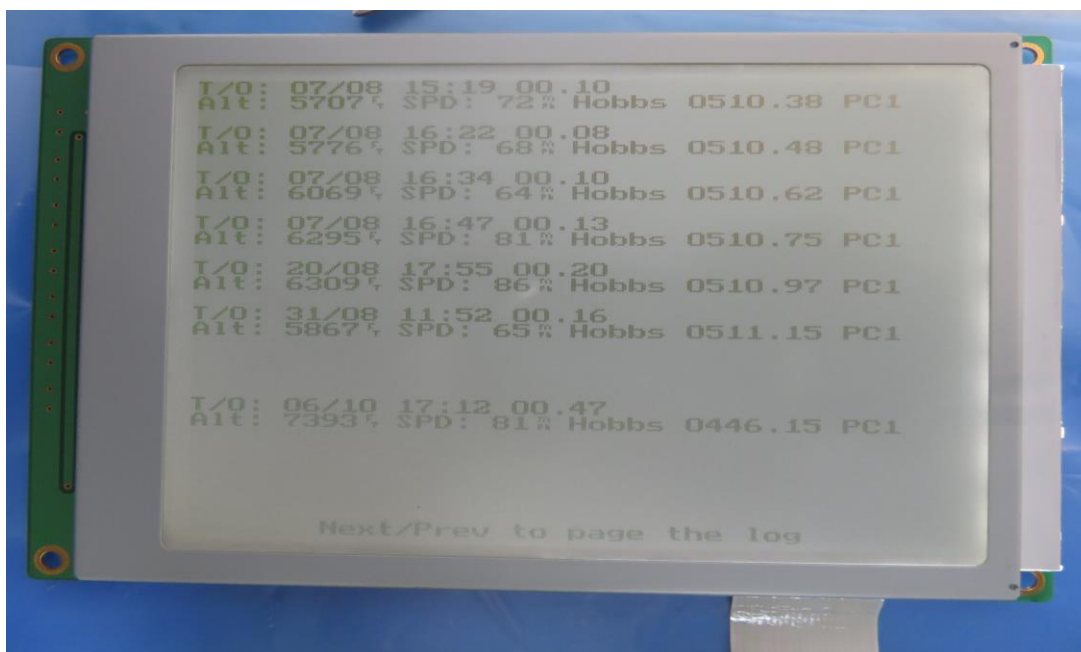


Figure 10: The last entries of the flight log

1.11.2 The flight log did not show anything out of ordinary. From the log it was apparent that the aircraft was used mostly for flight training as it shows a multitude of short flights lasting around minutes, consistent with circuit training work. All the hours counted together gave a total of 12.5 flight time. All the flight log information was not logged in the aircraft flight-folio/pilot logbook. According to the last flight-log entry the accident flight lasted for less than twelve minutes.

1.12 Wreckage and Impact Information:

1.12.1 The accident happened onto an open field, corners of Langkloof and Rogers in Alrode. The aircraft flight path comprises of three high voltage power lines pylons. Examination of the accident site revealed that the aircraft had struck the top section of the middle pylon with the right wing before crashing onto the ground. The aircraft impacted the ground in a flat attitude, with no significant horizontal travel. Apart from the failure of the monopole and forward strut, the damage to the trike was consistent with a vertical impact with the ground. The wreckage was contained within a three meter radius of the impact point. There were no signs of any pre-impact loss of integrity with the microlight's flying wires or 'A' frame. The wing's right leading edge tube had failed outboard of the cross tube and the wing's fabric was torn and frayed in that area, showing in-flight damage consistent with collision with the pylon. The base frame was severely damaged, but all indications were that it was as a result of ground impact. A visual assessment of the fuel remaining in the tank indicated about twenty five (25) liters of 95 unleaded fuel.

1.12.2 The right carburetor bowl was removed from the carburetor and examined. About one ounce of fuel was drained. The engine had not sustained any visible damage apart from the propeller blades and the right carburetor, which had separated from the attachment flange. Two propeller blades had been sheared from the blade root. Two pieces of the propeller blade tip, identified as being from the two sheared blades, were recovered from the northern side of the pylons. The third blade fragmented diagonally down the length of the blade consistent with it rotating when the accident occurred. The undercarriage was severed due to impact. The wreckage was recovered to Panorama aerodrome for detailed examination. The propeller was removed from the engine to facilitate crankshaft rotation. The top spark plugs were removed and examined; their electrodes were intact and light gray in color indicating the engine mixture was correct. The magneto drive was intact and a strong spark was observed at each of the spark plug connectors. The crankshaft was then rotated by hand. Camshaft, crankshaft, and valve train continuity were confirmed. Compression was attained on all cylinders. The ignition switch and the magnetos were found to be in the “on” position. All of the major components of the aircraft were accounted for and the aircraft appeared to have been correctly assembled or rigged; was structurally intact and that the engine was producing power at the time of the accident. Attached below is the Google Earth map showing the distance from the departure aerodrome up to the accident site.

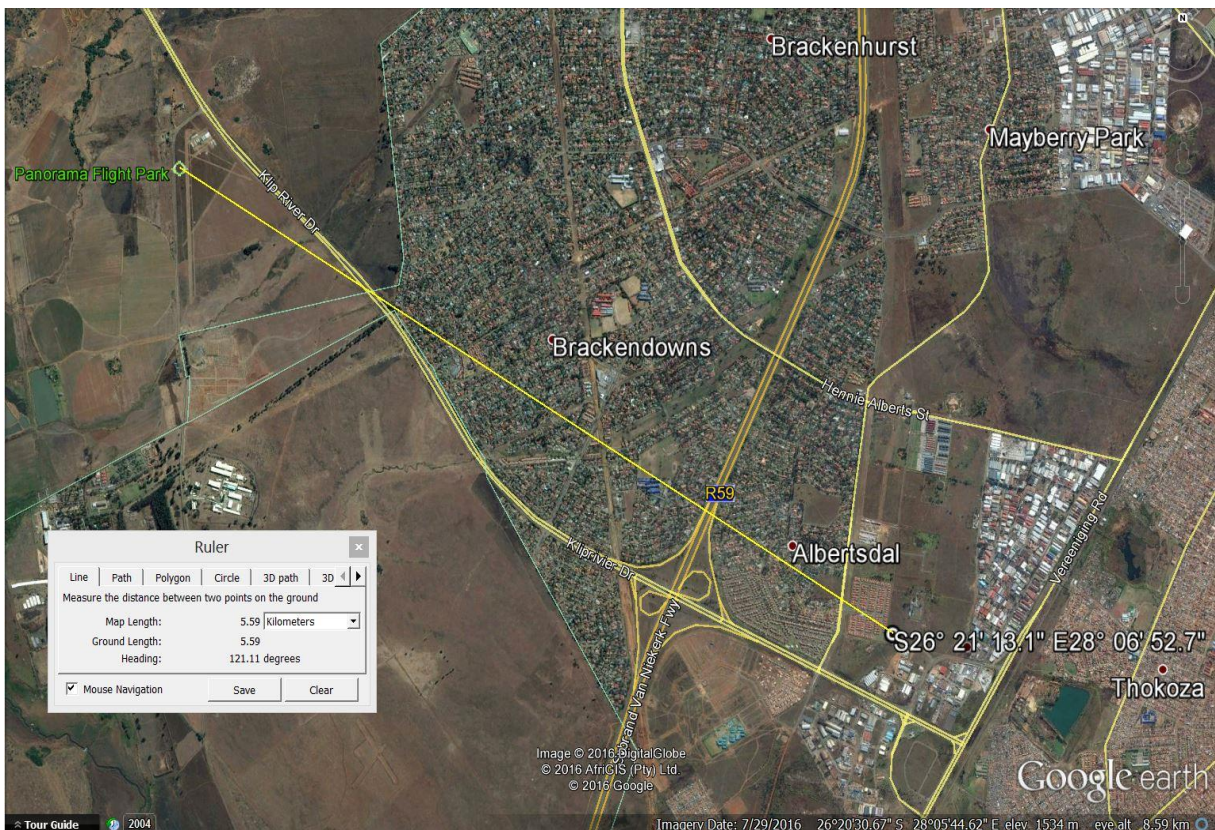
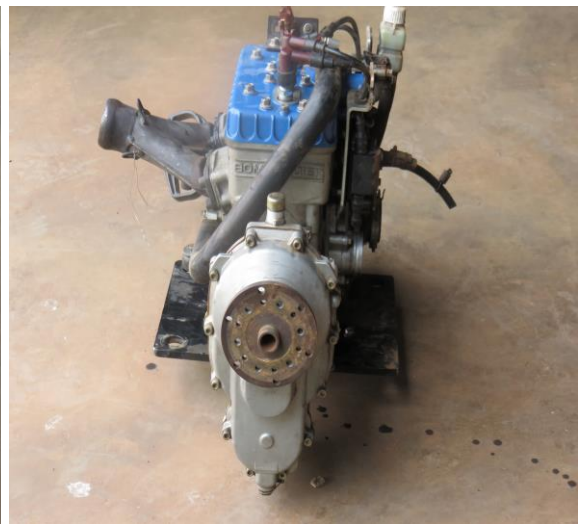


Figure 11: Calculated distance from the departure aerodrome up to the accident site



Figures 12: Failed rightwing displaying witness marks sustained after the collision



Figures 13: Accident severed propeller blades and the engine after they were separated



Figures 14: The aircraft dash showing the master with the magneto switches and the main landing gear with no fairings fitted to them



Figures 15: Accident severed propeller blades and the fuel sample taken during the on-site investigation

1.13 Medical and Pathological Information:

1.13.1 Post-mortem examination was conducted and stated that the pilot had died of multiple blunt force injuries sustained at the time of the accident. The pilot's last aviation medical assessment was conducted on the 30th of September 2010 at which time there was no identified medical condition. In addition, there was no pathological evidence of any significant natural disease or toxic substance that might have impaired the pilot's ability to control the aircraft. Family and friends of the pilot reported that he was fit and well rested in the period leading up to the accident.

1.14 Fire:

1.14.1 No evidence of pre or post impact fire was reported.

1.15 Survival Aspects:

1.15.1 The accident was regarded not survivable. According to the emergency services, both occupants were properly harnessed into their respective seats. They were also wearing helmets which allowed intercom communications during the flight, however there was little protection afforded to them due to the cockpit design of the aircraft. The pilot was fatally injured and the passenger survived with serious injuries. The pilot's body was removed from the wreckage and handed into the care of the Forensic Pathology services located at Germiston. Brackendowns detectives have opened an inquest investigation docket.

1.16 Tests and Research:

1.16.1 No flight activity to Alrode industrial site was permitted. Inferring that the pilot had in totality contravened the South African civil aviation authority "SACAA" regulation 91.06.32 of 2011 as amended. The investigators examined the field the pilot intended to land on. The field was about 230 meters in length. Towards the end of the field, in the direction of the flight were construction rubbish dump and other obstacles (Figure 18). The pilot aborted the landing roughly 80 meters short of the rubbish dump and obstacles in the direction of the power lines/pylons from which the aircraft struck the middle pylon top section with right wing tip.

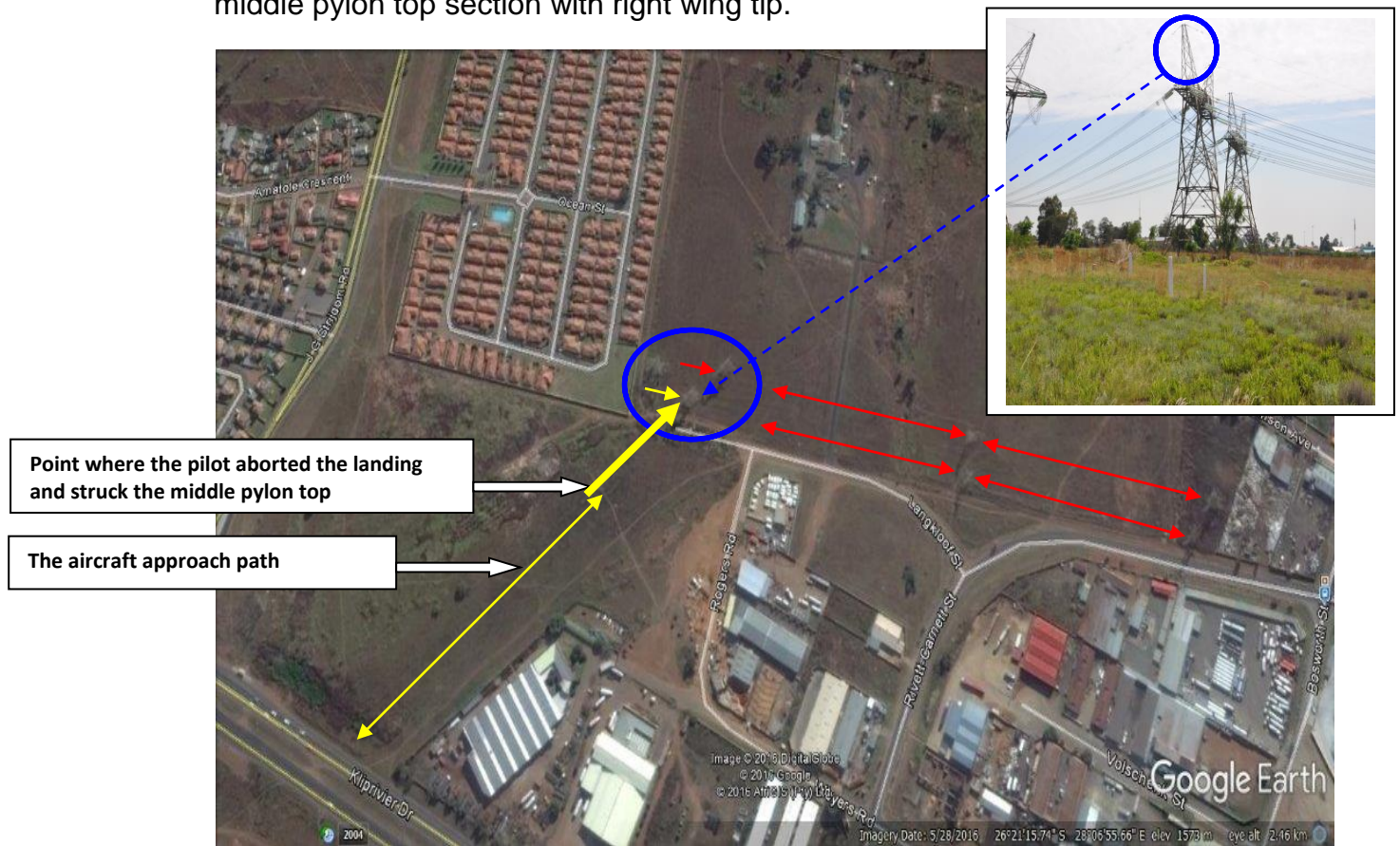


Figure 17: Google Earth map showing the accident site and the power lines/pylons "red" and the obstacles



Figure 18: Obstacles and construction rubbish dump towards the end of the field

1.17 Organisational and Management Information:

1.17.1 This was a private flight with the pilot being the owner of the aircraft.

1.17.2 The last annual inspection carried out on the aircraft prior to the accident was certified at 472 total flight time on 04 April 2016 by an approved person (AP) stamp No 027, under the AP scheme from the Aero Club of South Africa

1.18 Additional Information:

1.18.1 None.

1.19 Useful or Effective Investigation Techniques:

1.19.1 None.

2. ANALYSIS:

2.1 The information from the South African weather services report showed that fine weather conditions prevailed in the area at the time of the accident. The pilot held a valid national pilot's license and was medically fit to undertake the flight. Available information indicated that the pilot had accumulated a total of 110.41 hours flight time; of which 76.21 total flight hours was on type. The post-mortem report indicated that the pilot died of injuries sustained during the initial impact sequence. At the time of the occurrence, the pilot was well rested. There was no indication of any pre-impact mechanical anomalies. ZU-CEA aircraft was privately owned and registered and a review of its technical documentation or records indicated that it had been maintained in accordance with the approved procedures. The weight and balance calculation indicated that the aircraft's weight was within limits at the time of the flight and subsequent accident.

2.2 Nothing was found to indicate that any mechanical malfunction contributed to this accident. Considering the condition of the field the pilot envisioned landing on and the point at which he aborted the landing, it was probable that he recognized that he won't be able to safely stop the aircraft on the remaining portion of the field, from which he took power. However, during the climb phase, the aircraft struck the middle pylon top section with the right wing tip rendering ground impact inevitable. The pilot was fatally injured and the passenger sustained serious injuries. The aircraft was destroyed during the accident sequence. Post-accident investigation determined that the accident was as a result of the pilot's poor decision making and lack of a sense of immediate danger. In addition, it was a violation of the SACAA regulation 91.06.32 of 2011 as amended.

2.3 The investigation moreover suggested that the pilot could have opted for road transport to Alrode industrial site instead of flying as it could have saved him a great deal and protected him and passenger from becoming part of the accident statistics. In addition, even in the event that a subject pilot was aware of the pylons on his flight path, the distance and the operating speed might have limited his opportunity to react and avoid.

3. CONCLUSION:

3.1 Findings:

3.1.1 The pilot was a holder of a valid national pilot's licence and had the aircraft type endorsed in his logbook.

3.1.2 The pilot's medical certificate was valid without restrictions.

3.1.3 Fine weather conditions prevailed at the time and were not considered to have had bearing on the occurrence.

3.1.4 The AP that performed the last annual inspection on the aircraft prior to the occurrence was in possession of a valid AP approval certificate No 027.

3.1.5 Nothing was found to indicate that any mechanical malfunction initiated or contributed to this fatal crash, and the aircraft had sufficient usable unleaded fuel free of water and sediments on-board.

3.1.6 A pre-flight inspection was conducted by the pilot and observed by the passenger and the aircraft was found to be in an airworthy condition.

3.1.7 There were no reported problems with the serviceability of the aircraft before or during the accident flight.

3.1.8 The aircraft was in possession of a valid authority to fly at the time of the accident.

3.1.9 The accident was regarded as survivable.

3.1 Probable Cause/s:

3.1.1 Collision with the power lines/wire strike.

3.2 Contributing factor/s:

3.2.1 Failure to look out.

4. SAFETY RECOMMENDATIONS:

4.1 None.

5. Appendices:

5.1 The Civil Aviation Regulations of 2011 as amended state:

Minimum heights:

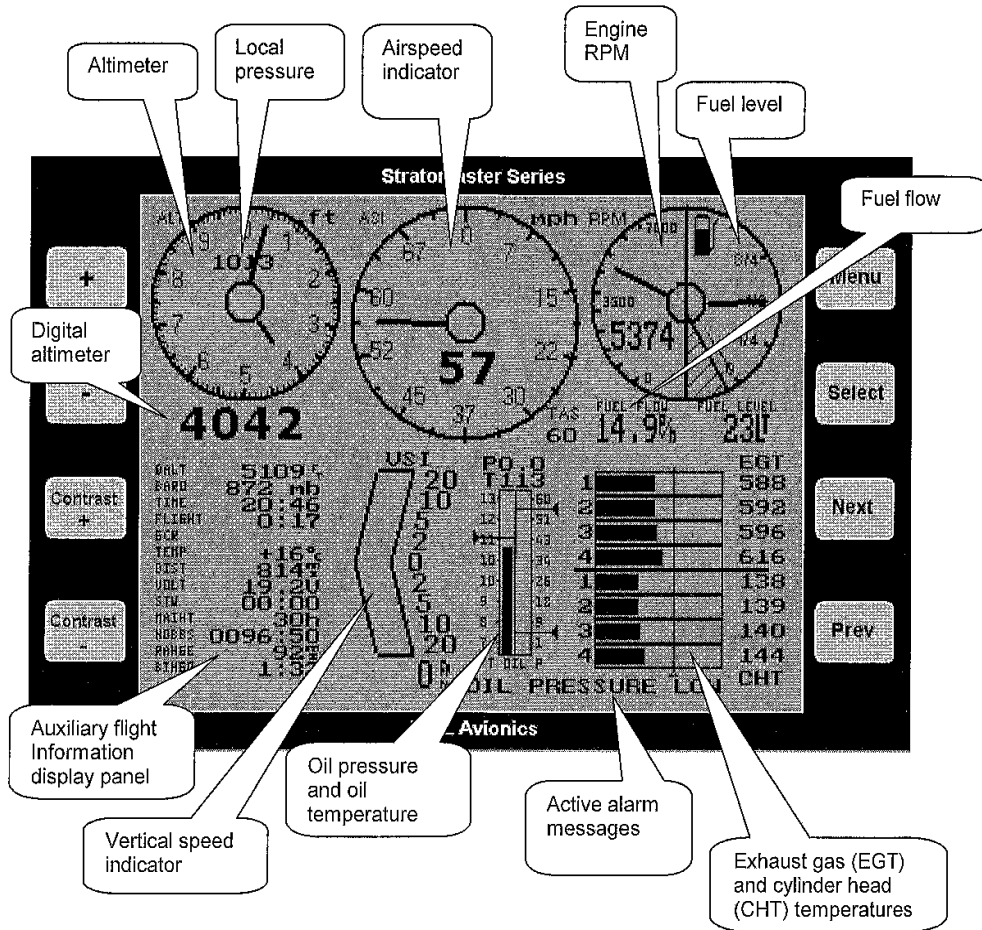
91.06.32 (1) Except when necessary for taking off, or landing, or except with prior written approval of the Director, no aircraft—

- (a) shall be flown over congested areas or over an obvious open-air assembly of persons at a height less than 1 000 ft above the highest obstacle, within a radius of 2 000 ft from the aircraft;
- (b) when flown elsewhere than specified in paragraph (a), shall be flown at a height less than 500 ft above the ground or water, unless the flight can be made without hazard or nuisance to persons or property on the ground or water and the PIC operates at a height and in a manner that allows safe operation in the event of an engine failure; and
- (c) shall circle over or do repeated over flights over an obvious open-air assembly of persons at a height less than 3 000 ft above the surface.

**Note: Height restrictions may also be imposed by other persons than the Director. Such restrictions may be found in Volume 1 of “Aviation Law in South Africa” in the section Miscellaneous Legislation and in the AICs.*

5.2 MGL Avionic device:

The main display – a detailed look



The above display is active whenever you are not viewing one of the functions available through the menu system. This is the display that you will see both on the ground and in flight. Flight mode is shown with a flashing "F" to the right of the digital altimeter display. An active flight is subject to storage of its details in the flight log as the flight ends.

...END...