

TECHNICAL REPORT

A-010/2023

Accident on 17 June 2023 involving a MOONEY M 20K 231 aircraft, registration N-192JM, at Casarrubios del Monte Aerodrome (Toledo, Spain)

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NOTICE

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission regarding the circumstances of the accident that is the object of the investigation, its probable causes, and its consequences.

In accordance with the provisions in Article 5.4.1 of Annex 13 of the International Civil Aviation Convention; and with Articles 5.5 of Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010; Article 15 of Law 21/2003 on Air Safety; and Articles 1, 4 and 21.2 of RD 389/1998, this investigation is exclusively of a technical nature, and its objective is the prevention of future aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent their recurrence. The investigation is not intended to attribute any blame or liability, nor to prejudge any decisions that may be taken by the judicial authorities. Therefore, and according to the laws specified above, the investigation was carried out using procedures not necessarily subject to the guarantees and rights by which evidence should be governed in a judicial process.

Consequently, the use of this report for any purpose other than the prevention of future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.

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ABBREVIATIONS

° ‘ “	Degrees, minutes, seconds
°	Sexagesimal degrees
°C	Degrees Celsius
GDC	Air data computer
GDU	Flight information unit
GEA	Engine control unit
GIA	Integrated avionics unit
GMA	Audio panel
GMC/GCU	Remote flight control system
GMU	Triple-axis magnetometer
GRS AHRS	Attitude and heading reference system
GSD	Data aggregator system
GTX	Transponder
h	Hour
HP	Horsepower
IFR	Instrumental flight rules
kg	Kilogram
km	Kilometres
km/h	Kilometres per hour
kt	Knots
LEMT	ICAO code for Casarrubios del Monte Aerodrome (Toledo)
LPFR	ICAO code for Faro Airport (Portugal)
m	Metre
m ²	Metres squared
mb	Millibars
MFD	Multi-function display
MHz	Megahertz
N	North
NM	Nautical miles
W	West
PFD	Primary flight display
PPL(A)	Private aircraft pilot licence
s	Seconds
SD	Secure digital memory card
TAWS-B	Terrain Awareness and Warning System
VOR	Very High Frequency Omnidirectional Radio Range

TECHNICAL REPORT

A-010/2023

Owner and Operator:	Private
Aircraft:	MOONEY M 20K 231, registration N-192JM
Date and time of the incident:	17 June 2023, at 14:00 h (local time ¹)
Site of the accident:	Casarrubios del Monte Aerodrome (Toledo)
Persons on board:	Two (2). One (1) crew and a (1) passenger
Phase of flight:	Landing
Flight rules:	VFR
Type of flight:	General Aviation – Private.
Date of approval:	27, September, 2023

SYNOPSIS

Summary:

The MOONEY M 20K 231 aircraft on registration N-192JM, arriving from Faro Airport - LPFR (Portugal), with two occupants on board, made an approach to runway 26 at Casarrubios del Monte Aerodrome - LEMT (Toledo).

On landing, it made contact with the runway and lifted slightly into the air again several times.

The last contact was made at the threshold of runway 08, after which it lifted into the air again, then veered to the left and off the side of the runway when it was almost at the end of the asphalt.

On its course, it hit a metal structure next to the aerodrome's perimeter fence.

The occupants were unharmed and exited the aircraft unaided.

The aircraft sustained significant damage.

The investigation has identified the incorrect execution of the landing manoeuvre as the probable cause of the accident.

¹ Unless otherwise indicated, the report refers to local time. UTC can be calculated by subtracting two units.

1. FACTUAL INFORMATION

1.1. History of the flight

The MOONEY M 20K 231 aircraft on registration N-192JM took off from runway 28 at Faro airport - LPFR (Portugal) on 17 June 2023 at 11:55 h, with two people on board, the pilot and a passenger.

According to the information provided by the pilot himself,² he had received instructions from the control services to fly south after take-off.

Once he was established on that course, he was instructed to fly east and then directed to the NIRAK waypoint, as per the established flight plan.

The flight was direct, and when he was close to the Toledo VOR, he tuned into the frequency of Casarrubios del Monte Aerodrome - LEMT (Toledo), reporting his position to the southwest of the aerodrome and his intentions, both in Spanish and English.

According to his account, the aerodrome replied in Spanish, but he didn't understand what they said nor what other aircraft flying in the area were transmitting over the radio.

He approached the aerodrome from the southwest and, to get an overview of the traffic in the area, joined from the south at the altitude established in the aerodrome's procedures.

At first, he thought runway 08 was in service but, according to his statement, during the approach it changed to runway 26. As a result, when he was on approach to runway 08, he made a right turn to cross at the mid-point of the runway and enter the approach to runway 26.

The RADAR trace shows that the aircraft was heading straight towards runway 08 and then made the aforementioned right turn when it was between the towns of Valmojado and Casarrubios del Monte (both in Toledo) flying at an altitude of 2,500 ft, going from a heading of 37° to a heading of 135°, then 90°, and then taking a heading of 348° and crossing the runway at the mid-point, to enter the circuit at the point established in the aerodrome's procedures.

The pilot also reported that he was communicating by radio throughout the time he was attempting to approach the airfield to land and that he communicated his intentions, all positions and changes of direction.

He made an initial approach to runway 26 but was going a little too fast on the final leg, so he missed the approach, executing a "go-around" manoeuvre.

On the final leg of his second approach, he saw an aircraft taxiing on the runway following the runway heading, so, for safety reasons, he again missed the approach and flew another circuit.

These manoeuvres were performed with the landing gear down, but the flaps retracted.

According to the pilot, on the third approach, he was told by the aerodrome to turn left and fly east, so he followed the instruction.

After about 2 minutes, the aerodrome informed him that he could continue with the approach. He then turned and set an approach course for runway 26.

The information obtained from the RADAR trace corroborates the first missed approach when he was on long final for runway 26, which he missed by making a wide 180° turn to the left. The aircraft

² The route described by the pilot is consistent with the positions recorded by the RADAR, which was provided by ENAIRE.

then made another 180° turn to the right, which could correspond to the second missed approach mentioned by the pilot. However, the manoeuvres were executed away from the runway in both cases.

Afterwards, a heading change to the left (eastwards) can be seen, which is consistent with the instruction from the aerodrome. This heading was then maintained until the aircraft returned to the runway heading.

According to the pilot, on long final and at the circuit altitude, he extended the flaps fully (33°) while flying at approximately 90 kt and made a stable descent at a constant speed of about 75 kt, touching down on the threshold.

The aircraft then lifted slightly into the air until the main landing gear touched down again about 350 m to 400 m past the threshold. The process was repeated twice, and when he saw that there wasn't enough distance to stop the aircraft on the runway, he accelerated to full throttle to get airborne again and fly another circuit. The aircraft failed to gain altitude, so the pilot made a turn estimated at 35° to 40° to the left to avoid hitting the bushes and other vegetation at the end of the runway, beyond the airfield perimeter.

According to his account, due to the low ground clearance, he didn't retract the landing gear but did retract the flaps to reduce drag. At that point, it no longer had sufficient lift, and the aircraft dipped and flew over the area near the runway, colliding with a structure next to the aerodrome's perimeter fence.

The entire landing was captured by one of the aerodrome cameras that is pointed at runway head 26, and the last contact with the runway and subsequent turn to the left was recorded by another camera that is pointed at runway head 08.

The footage captured by the images is consistent with the pilot's account insofar as the aircraft touched down four times on the runway before turning with its wings level throughout, but contradicts his description of where it first made contact, which was not on the threshold of runway 26, but approximately 320 m further on.

There was a distance of approximately 70 m between the first and second touchdown points, approximately 100 m between the second and third touchdown points, and approximately 90 m between the third touchdown point and the fourth on the threshold of runway 08.



Figure 1 Trajectory of the aircraft

The aircraft then turned left with 70 m of asphalt runway still available.

- ▶ During all the touchdowns, the aircraft hardly rolled on the ground at all, lifting off again as soon as it touched down. After the fourth touchdown, it turned left, maintaining a height approximately equivalent to the length of 1 wing section (4 m).

1.2. Injuries to persons

Injuries	Crew	Passengers	Total in the aircraft	Others
Fatal				
Serious				
Minor				
Unharmed	1	1	2	
TOTAL	1	1	2	

1.3. Damage to the aircraft

The aircraft sustained significant damage.

1.4. Third-party damage

Several metal structures next to the aerodrome's perimeter fence.

1.5. Information about the personnel

The 63-year-old pilot had a private pilot license (PPL(A)) with an instrument rating, issued on 10 December 2013 by the German Civil Aviation Authority. He also had a licence issued by the United States Civil Aviation Authority on 17 May 2022.

Both licences were valid, as were the instrument rating and the Class 2 medical certificate issued by the German Civil Aviation Authority.

His experience was 702:19 h, almost all of which had been flown in type.

1.6. Information about the aircraft

The MOONEY M 20K 231 aircraft, registration N-192JM, was privately owned and manufactured with serial number 29-0337.

It is a low-wing aircraft measuring 8.15 m long and 2.5 m tall. It has a wingspan of 11.1 m. Its wing surface area is 16.3 m². Its empty weight is 1,074 kg, and its maximum take-off weight is 1,315 kg.

It has a retractable tricycle-type landing gear with a front wheel.

It was powered by a 200 HP CONTINENTAL IO-550-G6B engine with serial number 685105 and a HARTZELL PHO-J3YF-IRF propeller.

This aircraft has a cruising speed of 174 kt; its maximum speed is 195 kt.

It had a valid certificate of airworthiness, and at the time of the accident both the aircraft and the engine had approximately 1.485 flight hours. The last airframe maintenance check was carried out on 9 June 2023, when the aircraft had 1,482.6 flight hours, and the last engine maintenance check took place on 11 May, when it had 1,481.8 flight hours.

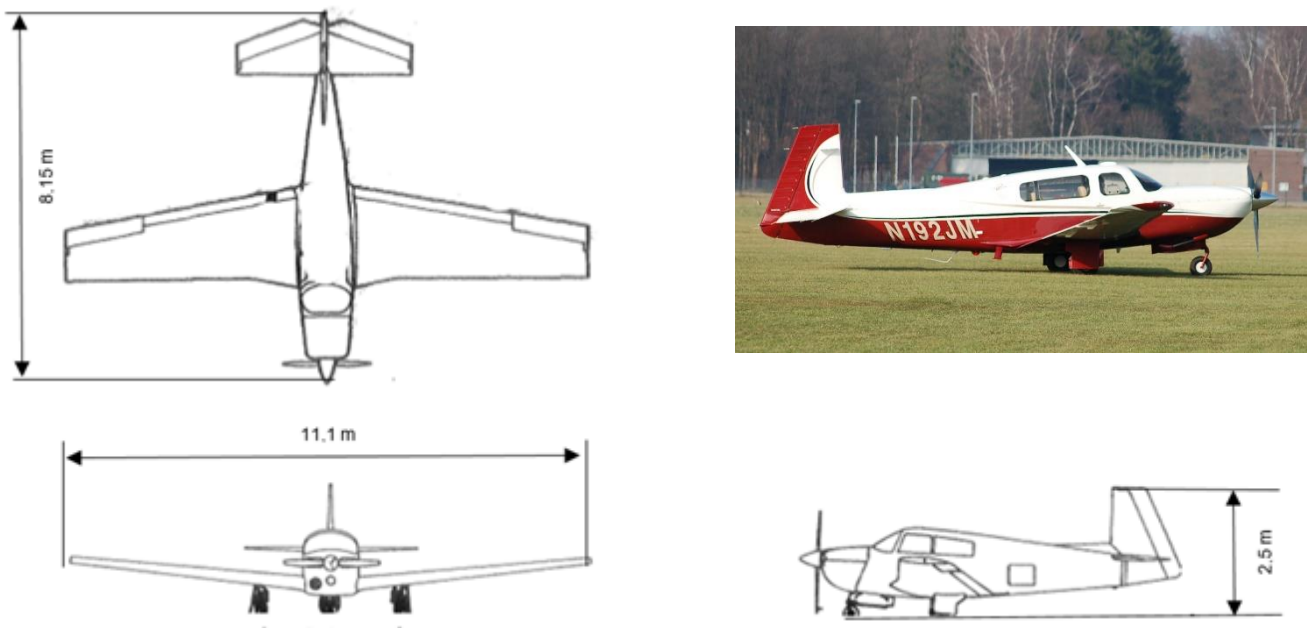


Figure 2. Images of the MOONEY M 20K 231 aircraft

The before landing checklist is set out in the aircraft flight manual:

1. Seats, belts and harnesses tightened and secured.
2. Landing gear extended below 135 kt of IAS.
3. Fully rich mixture.
4. Fuel selector on fuller tank.
5. Propeller pitch at high RPM.
6. Flaps fully deployed (33°) below 115 kt of IAS.
7. Trim adjusted as necessary.
8. Electric fuel pump switch on.
9. Air intake closed, check warning light off.
10. Verify landing gear down with gear down lights illuminated and with the ground visual indicator marks aligned.

In the event of having to execute a go-around:

1. Power full forward 2,700 RPM.
2. Speed 65 kt of IAS.
3. After stabilising climb fully retract flaps accelerating to 73 kt of IAS.
4. Retract landing gear after stabilising climb.
5. Cowl flap completely open.

During the landing:

1. Speed on final 71 kt of IAS with flaps fully deployed.
2. Touch down on runway with main landing gear wheels.

3. Gently lower nose wheel on landing rollout.
4. Apply brakes.
5. Retract flaps after exiting runway.
6. Cowl flap open
7. Electric fuel pump off after landing.
8. Trim in take-off position.

1.7 Meteorological information

The weather conditions at Casarrubios del Monte Aerodrome at the time of the accident were temperature 33° C, pressure 1,013 mb, visibility 11.7 km and wind direction 222°, with speed 14 kt and gusts of 20 kt.

1.8. Aids to navigation

The flight plan was as follows:

DOF599 162121 FF EKODFFLX 162121 LPPTZPZX (FPL-N192JM-VG -M20P/LSDFGRY/ S - LPFR0930 -N0174A035 3704N00752W DCT 3704N00749W DCT3703N00745W DCT 3708N00739W DCT NIRAK DCT 3754N00643W DCT3818N00616W DCT 3854N00536W DCT 3930N00459W DCT TLD -LEMT0134 -PBN/A1B3B4D2S1 DOF/230617 EET/LECM0010 ORGN/EKODFFLX

This plan indicates the departure airport (Faro Airport - LPPT) and the final destination (Casarrubios del Monte Aerodrome - LEMT), with a direct flight path to the different waypoints (DCT) as defined by their corresponding coordinates, as well as the pilot's ratings (PBN).

The information in the RADAR tracking report provided by ENAIRE allowed us to confirm that the trajectory followed by the aircraft coincided both with the account of the flight given by the pilot and with the flight plan.

1.9. Communications

During the post-accident inspection, it was confirmed that the radio was tuned to the airfield frequency of 123.500 MHz.

1.10. Information about the aerodrome

Casarrubios del Monte Aerodrome, with callsign LEMT, is located between the provinces of Madrid and Toledo, specifically 1.6 NM to the west of El Álamo, 3.6 NM to the south of Navalcarnero (both municipalities of Madrid) and 3 NM to the north of the Toledo municipality that gives it its name. Its reference point coordinates are 40°14'16" N - 4°01'35" W and its elevation is 625 m (2,050 ft). It has a paved 950 m-long by 25 m-wide runway designated 08 – 26.

The aerodrome's traffic pattern is to its north at 2,800 ft. The entrance point is 4 NM to the southwest of Navalcarnero and 1.6 NM to the west of the aerodrome.

Runway 08 has an offset threshold providing an available landing distance of 600m. The aerodrome is bordered from north to south by a road running perpendicular to the west of the extension of runway 26, which is approximately 10 m below the runway level, resulting in a significant slope on the extension of runway 26.



Figure 3. Overview of Casarrubios del Monte Aerodrome

1.11. Flight recorders

The aircraft did not have flight recorders, as they are not required by the applicable regulations.

It was equipped with a GARMIN 1000 navigation system whose information is displayed on two screens: the Primary Flight Display (PFD) on the left (viewed from the pilot's position), and the multi-function display (MFD) on the right.

The G1000 comprises the main flight information unit (GDU), an audio panel (GMA), a remote flight control system (GMC/GCU), an integrated avionics unit (GIA), the air data computer (GDC), an attitude and heading reference system (GRS AHRS), a triple-axis magnetometer (GMU), a transponder (GTX), an engine control unit (GEA) and a data aggregator system (GSD).

The primary flight display (PFD) shows the basic flight instruments, such as the airspeed indicator, the altimeter, the heading indicator and the course deviation indicator. A small "inset map" can be enabled in the corner. The PFD can also be used to program and activate flight plans. It also has a "reversionary mode", in which all the information displayed on the MFD is displayed on the PFD (e.g. engine indicators and navigation information). This capability is provided in case of an MFD failure.

The Multi Function Display (MFD) generally shows a moving map on the right-hand side and engine instrumentation on the left. Besides the map, the displays available on the MFD include the settings menus, information on the nearest airports and navigation aids, Mode S traffic reports and XM radio. Both the PFD and MFD have two SD memory card slots.

The upper slot is used to update the aviation database known as NavData and to load software and configurations into the system. The lower slot houses the world terrain and obstacle databases. While the terrain information rarely changes or needs updating, the obstacle databases can be updated every 56 days through a subscription service.

After an update, the upper card can be removed from the G1000 system, but the lower card must remain in both the PFD and the MFD to ensure accurate terrain awareness and TAWS-B information. The card in the top slot of the MFD allows flight records to be stored.

During the investigation, three of the SD cards were recovered, but the one that would have recorded the flight was not in its slot. During the investigation, the pilot was asked to provide it, but ultimately, it was not made available to the investigation and, therefore, the flight records could not be obtained.

1.12. Aircraft wreckage and impact information

The aircraft veered off to the left with 70 m of asphalt runway still available and crashed into a metal structure in an area where there were multiple pieces of scrap metal³ and debris, coming to rest at 40° 14' 0.31" N - 4° 1' 54.24" W, next to the aerodrome perimeter fence and 20 m from the fuel storage tank.



Figure 4.- Final position of the aircraft

There was significant damage to the entire front of the aircraft. The cone of the propeller (which was feathered) was crushed, and the three blades had several scratches but no significant deformities. The windscreen was broken on the passenger side.

The right wing was also badly damaged, with a substantial impact to the middle of the leading edge that had caused severe deformation from that point to the tip area, affecting the top surface area and extending all the way to the trailing edge.

The left wing was dented on the leading edge, next to the root. No evidence of any impact was observed from the back of the cockpit to the rear, including the tail.

The landing gear was also undamaged.

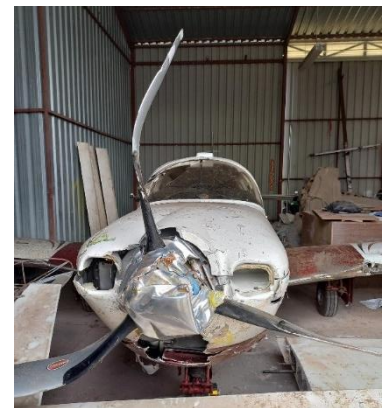


Figure 5. Damage to the

³ This scrap was within the airfield's safety zone.



Figure 6. Damage to the wings

1.13. Medical and pathological information

We have found no evidence to suggest the flight crew were affected by any physiological or disabling factors.

1.14. Fire

No fire broke out.

1.15. Survival aspects

The harnesses and restraint systems worked adequately, and the cabin interior maintained its structural integrity.

1.16. Tests and research

The video footage recorded by the airport's cameras shows the course the aircraft followed on the runway, allowing us to deduce the approximate distance it travelled and the time it took to do so, thus obtaining the speed at which it was travelling during the landing rollout.

The aircraft covered 260 m of the runway in 10 s, i.e. its speed was approximately 26 m/s, equivalent to 93.6 km/h or 50.54 kt.

The aircraft's performance was calculated considering the weather conditions at the aerodrome: a temperature of 33 °C, wind direction 222° and wind speed 14 kt with gusts of 20 kt. Pressure was 1013.7 mb and visibility 11.7 km.

datetime	temp	feelslike	humidity	dew	windgust	windspeed	winddir	pressure	visibility
10:00:00	25.4	25.4	47.6	13.5	18	7.5	107	1016.6	10
11:00:00	26.3	26.3	45.19	13.5	17.6	6	100	1014.6	20.4
12:00:00	29.1	28.4	36.46	12.7	19.4	9.5	148	1016.1	10
13:00:00	31.2	30.3	33.76	13.4	18	8.6	165	1015.1	10
14:00:00	33.4	32.2	27.66	12.2	20.2	14.1	222	1013.7	11.7
15:00:00	32.2	31.1	29.74	12.3	31	15.3	192	1013.7	10
16:00:00	32.8	31.6	28.5	12.2	32.8	16.1	189	1012.7	9.7
17:00:00	32.3	30.9	27.86	11.4	36.7	22.4	211	1010	20.5
18:00:00	33.4	31.9	25.86	11.2	37.8	24.1	220	1011.7	10
19:00:00	32.7	31.4	28.52	12.1	36.7	21.3	237	1011.2	10

Figure 7 Table showing the meteorological

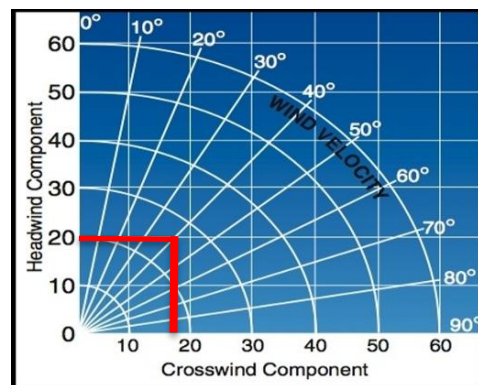


Figure 8. Crosswind component

At the most unfavourable wind speed (20 kt), we calculated the crosswind component as approximately 18 kt.

ASSOCIATED CONDITIONS:

TAKEOFF DISTANCES

POWER----- FULL THROTTLE, 2700 RPM
 (Before Brake Release)
 MIXTURE --- LEAN FOR SMOOTH OPERATION
 FLAPS ----- 15°
 LDG. GEAR-- EXTENDED UNTIL OBSTACLE CLEARED

RUNWAY----- PAVED, LEVEL, DRY SURFACE
 WEIGHT----- 2740 LBS.
 TAKEOFF SPEED----- 73 MPH/83 KTS IAS
 CLIMB OUT ----- 82 MPH/71 KTS IAS
 COWL FLAPS----- FULL OPEN

Wind Component Down Runway Knots	OAT °C	PRESSURE ALTITUDE									
		Sea Level		2000 FT.		4000 FT.		6000 FT.		8000 FT.	
		Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet
0	-20	704	1374	854	1646	1049	2074	1392	2808	1778	3620
	-10	765	1482	928	1776	1140	2237	1513	3028	1933	4118
	0	829	1594	1005	1910	1235	2405	1639	3256	2094	4436
	10	886	1711	1086	2080	1334	2581	1771	3494	2262	4746
	20	965	1831	1170	2194	1438	2764	1908	3738	2437	5077
	30	1037	1955	1258	2344	1545	2951	2051	3992	-----	-----
10	-20	632	1255	769	1507	948	1906	1263	2490	1619	3537
	-10	688	1356	837	1629	1032	2059	1375	2787	1763	3818
	0	747	1460	908	1754	1120	2217	1492	3011	1913	4109
	10	814	1575	989	1885	1212	2382	1615	3236	2070	4412
	20	872	1681	1061	2021	1309	2555	1743	3468	2233	4725
	30	939	1796	1143	2182	1408	2730	1876	3708	-----	-----
20	-20	570	1446	696	1381	862	1753	1151	2389	1480	3275
	-10	622	1540	760	1495	940	1897	1255	2583	1615	3541
	0	676	1638	826	1613	1021	2045	1365	2786	1755	3815
	10	738	1745	895	1736	1107	2200	1479	2997	1901	4101
	20	791	1848	967	1862	1197	2362	1596	3214	2054	4397
	30	854	1954	1043	1995	1290	2528	1723	3441	-----	-----
30	-20	519	1165	612	1122	711	1387	852	1652	1011	1984
	-10	565	1240	660	1210	760	1490	910	1760	1070	2100
	0	615	1320	710	1300	810	1600	970	1880	1140	2240
	10	670	1410	760	1400	870	1720	1040	2020	1220	2400
	20	730	1510	820	1510	940	1860	1120	2180	1310	2580
	30	795	1620	890	1630	1020	2010	1210	2360	1410	2780

NOTE: 1) Maximum demonstrated crosswind velocity is 12 MPH (11 Knots). 2) Where distance value has been deleted, climb performance after lift off is less than 150 ft./min. 3) Conditions of high humidity can result in an increase of up to 10% to the above take-off distances.

Figure 9 Calculation of take-off run and take-off distance

Based on the figure above, the take-off run would be 1,043 ft (317.9 m), and the take-off distance would be 1,995 ft (608 m).

NORMAL LANDING DISTANCES

ASSOCIATED CONDITIONS:

POWER----- THROTTLE CLOSED
 LANDING GEAR----- DOWN
 WING FLAPS----- FULL DOWN (33°)
 WEIGHT----- 2740 LBS.

RUNWAY - PAVED, LEVEL, DRY SURFACE
 APPROACH SPEED AT 50 FT - 81 MPH (71 KTS.) IAS

Wind Component Down Runway Knots	OAT °C	PRESSURE ALTITUDE									
		Sea Level		2000 FT.		4000 FT.		6000 FT.		8000 FT.	
		Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet	Ground Roll Feet	Total Over 50 Ft. Obstacle Feet
0	-20	773	1805	904	1911	1046	2103	1193	2373	1343	2667
	-10	804	1851	940	1969	1087	2107	1240	2450	1401	2755
	0	834	1906	976	2028	1129	2238	1287	2526	1454	2842
	10	865	1962	1011	2089	1170	2305	1334	2603	1508	2930
	20	896	2018	1047	2149	1211	2372	1382	2680	1561	3017
	30	926	2074	1083	2209	1253	2439	1429	2757	1614	3105
10	-20	728	1700	854	1805	990	1990	1131	2250	1281	2534
	-10	758	1746	889	1862	1030	2056	1177	2326	1332	2620
	0	788	1800	924	1920	1070	2122	1223	2400	1384	2706
	10	818	1855	958	1979	1110	2187	1268	2475	1436	2791
	20	848	1910	993	2038	1150	2253	1315	2551	1488	2877
	30	877	1964	1028	2097	1191	2319	1361	2626	1540	2963
20	-20	688	1601	808	1703	938	1882	1074	2132	1218	2406
	-10	717	1646	841	1758	977	1946	1119	2206	1269	2491
	0	745	1698	875	1814	1017	2012	1163	2279	1319	2574
	10	774	1751	909	1874	1055	2075	1208	2353	1370	2658
	20	804	1806	943	1931	1094	2139	1253	2426	1421	2742
	30	832	1859	977	1989	1134	2204	1298	2501	1471	2827
30	-20	600	1411	610	1410	710	1410	810	1410	910	1410
	-10	640	1480	650	1480	750	1480	850	1480	950	1480
	0	680	1550	690	1550	790	1550	890	1550	990	1550
	10	720	1620	730	1620	830	1620	930	1620	1030	1620
	20	760	1690	770	1690	870	1690	970	1690	1070	1690
	30	800	1760	810	1760	910	1760	1010	1760	1110	1760

NOTE: Maximum demonstrated crosswind velocity is 12 MPH (11 Knots).

Figure 10 Calculation of landing rollout and landing

According to the performance tables, the landing rollout would be 977 ft (297.7 m), and the landing distance would be 1,989 ft (606 m).

1.17. Organisational and management information

N/A.

1.18. Additional information

No additional information.

1.19. Special investigation techniques

N/A.

2. ANALYSIS

According to the information provided by the pilot, which coincided with the data obtained from the study of the RADAR trace, the flight proceeded normally until he reached the vicinity of Casarrubios del Monte Aerodrome, at which point he mistakenly thought that runway 08 was in service when, in fact, runway 26 was operational.

However, this did not prevent him from making the approach to runway 26 after joining the traffic pattern.

The pilot may have been somewhat confused as he couldn't understand the communications made by other aircraft in the area, but everything indicates that he did understand the instructions given to him by the aerodrome radio channel.

On the last approach, which ended with the runway excursion, the video footage shows that the aircraft was straight and level.

Although it hasn't been possible to determine the aircraft's speed on the final leg, we have been able to estimate the speed at which it travelled on the runway from the moment of initial contact until the last time it lifted back into the air and turned to the left. This speed was approximately 50.54 kt, which is consistent with the pilot's statement that he approached at 75 kt and also with the approach speed established in the aircraft's flight manual.

There is, therefore, no evidence that the aircraft landed at an excessive speed that would have prevented the pilot from being able to slow it down and stop on the runway.

What can be seen in the video is that the initial contact with the runway was made well beyond the threshold and that each time, after this first contact and the following three times, the aircraft rises again because the pilot did not hold the elevator control to settle it on the ground.

The aircraft travelled approximately 260 m down the runway before attempting to get airborne again. This indicates that the pilot did not cut engine power, which was probably the cause of the aircraft becoming airborne again.

Although there were some marks on the ground near the area where the aircraft impacted, there was no clear evidence of it having touched the ground after it departed the runway from the left, but this cannot be ruled out either.

The area of impact, close to the fuel storage tank that aircraft must approach for refuelling, was strewn entirely with disorganised scrap metal, as if it were a rubbish dump, within the aerodrome's safety zone. These multiple scattered metal elements could easily puncture an aircraft tyre.

For this reason, we are recommending that the owners of Casarrubios del Monte Aerodrome remove all the scrap metal in the area in order to prevent fires or major damage in the event of a runway excursion, as happened in this incident.

3. CONCLUSIONS

3.1. Findings

- The aircraft made the flight from Faro Airport (Portugal) as per the flight plan.
- The pilot had made three prior attempts to approach runway 26 but did not complete the landing manoeuvre.
- During the landing, he made contact with the asphalt four times but was unable to keep the aircraft on the runway.
- After the fourth touchdown, he accelerated the aircraft and veered to the left, climbing slightly.
- The aircraft hit a metal structure and sustained significant damage.

3.2. Causes / Contributing factors

The investigation has identified the incorrect execution of the landing manoeuvre as the probable cause of the accident.

4. RECOMMENDATIONS

REC. 24 /23. It is recommended that the owners of Casarrubios del Monte Aerodrome remove all the scrap metal in the area near the runway and taxiway in order to prevent fires or major damage in the event of a runway excursion, as happened in this event.