

ACCIDENTS INVESTIGATION BRANCH  
Department of Trade and Industry

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**Bristow Helicopter Agusta Bell 206A  
Jet Ranger G-AVSV. Report on the  
accident which occurred 20 nautical miles  
from Accra Kotoka International Airport  
(near Fetteh Gomoah) on 22 July 1970**

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List of Civil Aircraft Accident Reports issued by AIB in 1972

<i>No.</i>	<i>Short title</i>	<i>Date of publication</i>
1/72	Comet 4 G-APDN in the Sierra del Montseny near Barcelona, Spain, July 1970	February 1972
2/72	Bristow Helicopter Agusta Bell 206A Jet Ranger G-AVSV near Fetteh Gomoah, July 1970	February 1972

My Ref No C/G—AVSV

Department of Civil Aviation  
PO Box 87  
Kotoka International Airport  
Accra  
Ghana

26 April 1971

#### CIVIL AIRCRAFT REPORT

I attach, hereto, the final report of the team which investigated the circumstances which led to the accident to Bristow Helicopter Agusta Bell 206A Jet Ranger G—AVSV which occurred 20 nautical miles from Accra Kotoka International Airport (near Fetteh Gomoah) on 22 July 1970 at about 0818 GMT.

I have accepted the recommendations and conclusions of the investigating team.

(E R K Dwemoh)  
*Director of Civil Aviation*

The Principal Secretary  
Ministry of Transport and Communications  
PO Box M38  
Accra  
Ghana



## Civil Accident Report

*Aircraft:* Agusta Bell 206A Jet Ranger G—AVSV  
*Engine:* Allison 250 – C18 Turboshaft  
*Registered Owner:* Bristow Helicopters Limited, Redhill, Surrey,  
England  
*Operator:* Bristow Helicopters Limited  
*Pilot:* Peter John Faid – Fatally injured  
*Passengers:* Three – Fatally injured  
*Place of Accident:* 20 Nautical Miles from Accra near Fetteh Gomoah,  
Ghana  
*Date and Time:* 22 July 1970 at 0818 GMT

Representatives from UK Accidents Investigation Branch; Bell, Fort Worth, USA; Agusta, Italy; and Bristow Helicopters Limited, Redhill, England participated in the investigation.

## Summary

The helicopter was returning from the Signal Oil rig off the coast of Saltpond to Kotoka International Airport when the pilot experienced excessive vibration which he took to be engine trouble. This made him decide to make a precautionary landing on the coast. Before the landing could be accomplished a technical failure of the transmission gearbox occurred resulting in complete loss of control of the helicopter with fatal results to the pilot and passengers. The helicopter was wrecked but there was no fire.

# 1. Investigation

## 1.1 History of the flight

The aircraft was operating commercial-survey (domestic) service from the off-shore oil rig near Saltpond to Accra Kotoka International Airport. At about 0817 hours the pilot reported that he was having engine trouble which made him decide to make a precautionary landing on the coast. Before the pilot could accomplish this precautionary landing a technical failure of the transmission gearbox occurred which resulted in complete loss of control of the aircraft and subsequent crash with fatal results to the pilot and passengers. There was no outbreak of fire.

## 1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
Fatal	1	3	-
Non-fatal	-	-	-
None	-	-	-

## 1.3 Damage to aircraft

Total destruction.

## 1.4 Other damage

No damage to other property.

## 1.5 Crew information

1.5.1 *The Pilot.* Captain Peter John Faid a British national by birth was aged 36 years and held a valid United Kingdom Airline Transport Pilot's Licence (Helicopters and Gyroplanes) No 34122/H first issued in September 1968, and endorsed for him to act as pilot in command of Wessex 60 Series I, Westland S55 Series III and AB 206A.

His flying experience on AB Helicopter 206A at the time of the accident was 135 hours out of a total flying experience of 3,476 hours. According to his personal flying log book he had flown 31 hours 30 minutes during the 30 days period prior to the accident and 113 hours 25 minutes since he was medically examined and certified fit without any limitations on 11 February 1970.

Captain Faid had some military flying experience over a period of fifteen years and was a Bristow Helicopters Limited, Redhill, Surrey, employee during the time of the accident. His last competency check on AB 206A was on 23 May 1970.

#### **1.6 Aircraft information**

The construction of the aircraft was completed by Costruzioni Aeronautiche Giovanni Agusta, Italy on 7 December 1967. It was then purchased by Bristow Helicopters Limited, Redhill, Surrey and was first issued with a British Certificate of Airworthiness on 1 January 1968, since when it has flown a total of 600 hours.

Whilst on the British Register the aircraft operated in Fernando Po until 5 August 1968, when it was dismantled and airfreighted to England.

On 16 October 1968 the aircraft was transferred to the Bermudan Register and operated in Mauritania and Morocco until 10 November 1969. On return to England from Morocco the aircraft was placed on the British Register and prepared for service in Ghana. The maintenance carried out included the replacement of the main transmission gearbox spider (Bristow Helicopters Limited Inspection Survey Report 3442 dated 9 January 1970 refers).

The aircraft was airfreighted from UK to Cotonou, Dahomey, where it was reassembled on 28 January 1970 and test flown with nil defects. On 29 January 1970 the aircraft was flown to Accra and it started operations the following day.

The technical log records for the aircraft, the engine and rotor assembly revealed no history of significant or repetitive defect relevant to the transmission gearbox failure.

The weight and the centre of gravity of the aircraft were within the authorised limits and there was ample fuel for the proposed flight.

#### **1.7 Meteorological information**

The sky was covered with 6/8-7/8 of low broken cloud at an average height of 1,500 feet. The average temperature was 24°C and the dew point was 22°C. The visibility was good (over 10 Km) and there was no weather.

The wind overland was south-westerly with the speed varying between 3 and 7 knots. This speed could be much higher over the sea, probably attaining 10 to 15 knots.

#### **1.8 Aids to navigation**

VFR flight.

#### **1.9 Communications**

Communications between the aircraft and the Kotoka Airport ATC were satisfactory.

*R/Transcript of 126.7 MHz – 22 July 1970*

<i>Time</i>	<i>Station</i>	<i>Text</i>
0655	GSV	Accra Centre Golf Sierra Victor Good Morning
	ACC	Sierra Victor Accra
	GSV	Accra Centre Golf Sierra Victor one two six seven
	ACC	Sierra Victor this is Accra
	GSV	Roger Loud and Clear, how me?
	ACC	Sierra Victor strength three
0656	GSV	Accra, Sierra Victor departed Accra zero seven zero one for Signal Oil rig, estimate Winneba zero seven two six
	ACC	Roger, copied okay
0657	ACC	Sierra Victor, what is your estimate for arrival?
	GSV	For where?
	ACC	Your estimate for arrival
	GSV	I'm sorry you are very distorted. Could you come again slowly?
	ACC	Roger. Request your echo tango alpha destination
	GSV	ETA destination zero seven four five
0658	ACC	Roger, copied okay
0717	GSV	Accra Centre Golf Sierra Victor
	ACC	Sierra Victor Accra
	GSV	Golf Sierra Victor overhead Winneba this time will call you Saltpond
	ACC	Roger
0728	GSV	Accra Centre Golf Sierra Victor
		Do you read?
	ACC	Station calling centre go ahead
	GSV	Golf Sierra Victor Saltpond this time, I'm in visual sight with the Signal Oil rig and will call you airborne.
	ACC	Sierra Victor Roger
0730	GSV	Charlie Golf Victor (??)
0752	GSV	Accra Centre Golf Sierra Victor one two six seven
0753	ACC	Golf Sierra Victor Centre go ahead
	GSV	Golf Sierra Victor departed Signal Oil rig zero seven five two. Saltpond. This time estimate Winneba zero eight one one Accra zero eight three S O B Four. Endurance at take-off one four five cruising two thousand feet VFR – go ahead



<i>Time</i>	<i>Station</i>	<i>Text</i>
0754	ACC	Sierra Victor Roger call again Winneba
	GSV	Winneba Sierra Victor
0805	GSV	Accra Centre Golf Sierra Victor checks Winneba one one
0806	ACC	Sierra Victor Roger the QNH one zero one seven millibars report field in sight
	GSV	Roger Wilco
0811	GSV	Accra Centre, Accra Centre, Accra Centre. Golf Sierra Victor
	ACC	Sierra Victor Centre go ahead
	GSV	Roger I've engine trouble . . ER . . I am . . ER . . making a precautionary landing on the coast . . ER . . Its right on the coast . . ER . . if you can plot me on radar this time over.
	ACC	ER . . . . . Roger standby
	ACC	ER . . . . . Yes Sierra Victor we have you on radar. You are twenty miles and your steering indication is two four nine at the moment.
0812	GSV	Roger Sierra Victor (??) (Distorted might be Victor)
	ACC	And . . . . . AH . . . . . confirm you are landing on the coast?
	GSV	. . . . . (Carrier wave with some indistinguishable modulation and fading.)

*Note:* Above times are from time injection signals which are about six minutes slow.

#### 1.10 Aerodrome and ground facilities

This is not a factor in this accident except for the Kotoka International Airport radar which was used to locate the aircraft thus helping search and rescue operations.

#### 1.11 Flight recorder

Not carried in this aircraft.

#### 1.12 Wreckage

The wreckage trail was approximately 120 feet wide and extended for about 300 feet on an easterly heading.

After detachment of the mast and rotor the aircraft struck the ground heavily at an estimated angle of approximately 45 degrees and right side down. The aircraft disintegrated.

The speed and altitude of the aircraft at the time of detachment of the mast and rotor cannot be determined with any accuracy. The altitude is however thought not to have been above 250 feet. There was evidence that following detachment of the mast one rotor blade struck the roof and nose section of the cabin with subsequent damage to the blade structure which caused the outer portion – 6 feet outboard of the root attachment to become detached. This outer section of blade was found 105 feet before the main rotor and mast and parallel with the estimated flight path of the aircraft. There were other pieces of the broken rotor blade and small light pieces of the aircraft structure over a distance extending back for about 300 feet.

The engine and transmission gearbox lower casing and gears were found in the immediate main wreckage area together with the flight deck instruments and controls.

Part of the gearbox top casing was still attached to the main mast assembly.

The transmission spider assembly was buried but was found approximately 6 feet forward of the instrument panel section. One pinion gear comprising the outer bearing race with rollers and bearing cage was missing. The inner race was still attached to the shaft and showed evidence of spalling and overheating. Part of the pinion locknut was recovered and there were indications that it became detached from the shaft – ie an imprint on the internal surface of the lower casing.

Examination of the engine at Accra and subsequently at Rolls-Royce Ltd Small Engine Division, Leavesden, England, revealed no evidence of any pre-crash mechanical defect or failure.

#### 1.13 Fire

No fire occurred.

#### 1.14 Survival aspects

This was a non-survivable accident.

#### 1.15 Tests and research

Transmission gearbox parts were taken to Costruzioni Aeronautiche, Giovanni Agusta, Cascina Costa, Gallarate, Italy, and subsequently to Bell Helicopters, Fort Worth, Texas, USA.

## 2. Analysis and Conclusions

### 2.1 Analysis

Technical analysis of the transmission gearbox failure is contained in the report attached from the design authority – Bell, Fort Worth, USA (Appendix A).

### 2.2 Conclusions

#### *a) Findings*

- 1 The certificate of airworthiness was valid. The certificate of maintenance although not signed was sufficient evidence that the required inspection had been carried out.
- 2 There was evidence of satisfactory maintenance in accordance with the approved maintenance schedule.
- 3 The Captain was qualified and experienced to conduct the flight.
- 4 The weight and centre of gravity of the aircraft were within the authorised limits and there was ample fuel for the proposed flight.
- 5 There was no pre-crash failure of the engine.
- 6 There was *pre-crash* failure of the planetary pinion gears (see Appendix B ).
- 7 There was no damage to other property.
- 8 There was no breach of Ghana Regulations.
- 9 No conclusive evidence could be found to confirm whether a cotter pin was installed.
- 10 A cotter pin would not have prevented the nut P/N 206–040–044 from backing off the pin P/N 206–040–043 under the prevailing circumstances.

#### *b) Cause*

The cause of the accident was loss of control following mechanical failure of the planetary pinion gears within the transmission gearbox.

### 3. Recommendations

- 1 It is recommended that the main gearbox magnetic plug chip detector must be replaced by the improved magnetic chip detector P/N B148 as mandatory modification. (See Appendix C.)
- 2 It is recommended rather strongly that specific instructions be issued by the manufacturers giving guidance on interpretation of any mechanical failure as indicated by particles adhering to the main gearbox magnetic plug.
- 3 Consideration should be given to the up-grading of the modification to the planetary pinion gear bearing P/N 206-040-035-5.