093-9697 [pl.3]

CONFIDENTIAL
CONFIDENTIEL

FILE No.
DOSSIER

093-9697

VOL 3

National Defence / Défense nationale

ACCIDENTS-AIRCRAFT

AIRCRAFT ACCIDENT 9697

CIRCULATION				P.A. RANGER		B.F. RAPPEL		REGISTRY ONLY DÉPÔT CENTRAL	
TO À	REMARKS REMARQUES	Date	Init.	Date	Init.	Date	Cancel annuler	Inspected Inspecté	Date

SCHEDULE / PÉRIODE DE
AUTHORITY / CONSERVATION
YEAR(S)

CONFIDENTIAL
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FILE No.
DOSSIER

DND703 (5-77)
7530-21-876-1638

VOL 3

093-9697

000634

CCHIT

CONFIDENTIAL

Copy 2

Board of Inquiry, Bristol
9697
Convened at 1 Wing RCAF

CONFIDENTIAL

CO, 1 Wing

7 Copies of the Board of Inquiry :

Since submission of the board is not strictly by the book, the following should happen :

1 copy - 1 Wing file

6 copies with ~~your remark~~ CO's remarks (forwarded through 2 Wing).

NOTE : 2 Wing : After inclusion of 2 Wing CO's remarks, make sure 2 Wing sends one advance copy to AFHQ.

1 copy - 2 Wing file

4 copies - to be sent by 2 Wing to Air Div.

I have forwarded Air Division Advance copy N° 8 as per instructions.

Original signed by
W/C Philps (President)

CO 2 Wing

6 copies to you after including CO's remarks, send
1 advance copy to AFHQ.
4 copies to Air Div HQ
1 copy 2 Wing

As per W/C Philps, President of the Board.

Original signed by
(AF Avant) C/C

Completed entirely

[redacted] AF GR 17
15M Pads of 100-5-54

TRANSIT SLIP Serial Number ... .

FILE REFERENCE C21-56-9697

Charged to ..... Date .....

DIRECTED TO

Registry Point	Staff Officer P.A. or D.F.O.	Date	Initials
XSO		14/10	
CO		19/10	
Comp O			
SATCO			
CR	PA	21/10	

IF NE FILE REQUIRED DESIGNATE SUBJECT

000637

TRANSIT SLIPS ... TO BE TREATED IN EXACTLY THE SAME

Our file ref. C093-9697(A/SOFS)

CANADA

DEPARTMENT OF NATIONAL DEFENCE

ROYAL CANADIAN AIR FORCE

Metz France
8 Oct 64

14 Oct 64
1415
C.21-56-9697
750.

Commanding Officer
1 Wing RCAF
CAPO 5057
Canadian Armed Forces Europe

Aircraft Accident - Bristol 9697
1 Wing Marville - 30 Dec 63

1 The Board of Inquiry on the subject accident has been reviewed and approved by CFHQ. Attached are copies of the CFHQ Evaluation of the Board and the CFHQ comments.

GOH Poulsen

(GOH Poulsen) F/L
for ACC 1 Air Division RCAF

Att:

SAFO

Note & P.A. ... CO

para 6 & CO

19/10

(• 8-57) 7530-21-801-6021

CONFIDENTIAL

Our file ref. C093-9697(COR/DFS)

CANADA

DEPARTMENT OF NATIONAL DEFENCE

ROYAL CANADIAN AIR FORCE

OTTAWA, Ont
8 Sep 64

COPY

Air Officer Commanding
1 Air Division RCAF
CAPO 5052
Canadian Armed Forces Overseas

Aircraft Accident - Bristol 9697
Marville France - 30 Dec 63

1 The Board of Inquiry concerning the a/n accident has been approved, with certain reservations. An evaluation of the proceedings is attached, and you will note that several major errors or omissions are discussed. Normally, these errors would have required Board re-convention; however, this course was decided against in favour of other action taken by this Headquarters.

2 After receipt of the Board of Inquiry and your letter C093-9697(ACC) 2 Mar 64, a review of air traffic control procedures and policies was completed, and a survey of all Commands was made with a view to determining if change was required or warranted. The result of this investigation was forwarded to all Commands in letter 835-1(VCAS) 23 Jul 64. Generally, the review established that a higher degree of standardization is desirable, and this will be effected.

3 So far as the Board of Inquiry is concerned it is not proposed in this letter to review and comment on every finding and recommendation. The action that has been taken so far, and that to follow, will produce the required improvements. Nevertheless, it is considered necessary to record the following criticisms:

(a) There is supported evidence of poor supervision at Division level of equipment serviceability and personnel proficiency. Prior to this accident no Command Check Team was in being, as suggested by CAP 342, and therefore no positive equipment and personnel proficiency checking system was in use. Had such a team been in existence it is reasonable to assume that the Marville GCA equipment discrepancies would have been noted, as well as deficiencies in operator techniques, and this accident might well have been avoided. The poor unit supervision of the RATCON function should also have been apparent and rectification made. The failure of Division Headquarters to recognize these failings reflects inadequate supervision of a serious nature.

(b) It should have been apparent early in the investigation that the aircraft control function was suspect and as outlined in AFAO 21.56/01, an ATC specialist should have been assigned as a Board member. While expert witnesses were used, this approach did not satisfy the requirement. ATC experience on the Board would have produced more valid conclusions and recommendations.

(c) The Board failed to call as a witness the Marville SATCO, who was responsible at Unit level for the control and function of the RATCON organization. This was a serious omission.

(d) The Board failed to determine why the staff in RATCON was reduced to only one controller on the night of 30 Dec 63, contrary to instructions contained in CAP 342.

(e) The Board failed to determine if equipment serviceability checks were in fact being conducted in accordance with instructions contained in CAP 342.

4 When the actions of the pilots are reviewed in the light of the conditions prevailing and considering accepted flight procedures, it is agreed that they cannot reasonably be held responsible for the accident. However, it is apparent that accepted flight procedures were inadequate under the circumstances, and a possible improvement of these procedures is being actively pursued.

5 Finally, it is agreed that the primary cause of the accident was "Other Personnel - Air Traffic Control" but, for reasons outlined above, equal responsibility is assessed to "Briefing - Supervision, Air Division". The major contributing cause is considered to be "Faulty Ground Facilities."

6 This unfortunate accident has been the cause of much concern to this Headquarters, and it must be recognized that every possible step should be taken to prevent a repetition. Therefore, in addition to action already taken by this Headquarters, affected staff officers and unit personnel should be thoroughly briefed on their responsibility for accepting only the highest standards from those concerned in any way with this important phase of flying operations.

(original signed by)
(J.V. Allard)
Lieutenant General
for Chief of Defence Staff

Att:

EVALUATION OF PROCEEDINGS OF BOARD OF INQUIRY

INVESTIGATING THE ACCIDENT TO

AIRCRAFT Bristol 9697 DATE 30 Dec 63 PLACE 1 Wing Marville France

CONVENED BY 166 A/V/M DAR Bradshaw DFC CD

COMPOSITION QR(AIR) 21.08 ADEQUATE ( ) INADEQUATE (X)

REMARKS: Considering the scope of the investigation, a Senior Air Traffic Control Officer should have been appointed as a member (Ref AFAO 21.56/01 para 63(d)).

PRESIDENT 27176 W/C OB Philp 3 Wing
Number Rank Initials Name Parent Unit

TERMS OF REFERENCE QR(AIR) 21.09 ADEQUATE (X) INADEQUATE ( )

REMARKS:

STAFF DUTIES BULLETIN 33 APP "B" - VERY GOOD ( ) SATISFACTORY (X) UNSATISFACTORY ( )

REMARKS: Numerous ink amendments and additions. R78As not all completed properly.

COLLECTION OF EVIDENCE - VERY GOOD ( ) SATISFACTORY ( ) INCOMPLETE (X)

REMARKS: The Board failed to call as a witness the SATCO 1 Wing - a serious omission. The Board also failed to determine why the RATCON staff was reduced to only one Controller, contrary to instructions contained in CAP 342, or if equipment serviceability checks had been conducted in accordance with CAP 342.

FINDINGS COMPLIANCE WITH QR(AIR) 21.57 YES (X) NO ( )

SUPPORTED BY EVIDENCE YES (X) NO ( )

REMARKS: The Findings were basically well supported by the evidence produced.

(Over)

EVALUATION RATING: EXCELLENT ( ) VERY GOOD ( ) SATISFACTORY (X) UNSATISFACTORY ( )

REMARKS:

CORRECTIVE ACTION BY STATION - ALL INCLUSIVE ( ) ADEQUATE (X) INCOMPLETE ( )

REMARKS:

CORRECTIVE ACTION BY COMMAND - ALL INCLUSIVE ( ) ADQUATE (X) INCOMPLETE ( )

REMARKS:

ADVANCE COPY RECEIVED ON TIME ( ) DAYS LATE.....21.....

COMMAND COPY RECEIVED ON TIME ( ) DAYS LATE.....38.....

GENERAL REMARKS: The delay in submission of the Proceedings is understandable and acceptable in this case.

ORIGINAL SIGNED BY
A B SEARLE G/C

AFHQ
OTTAWA

.....(AB Searle) G/C.....
Director of Flight Safety

NOTE: It is suggested that one copy of this evaluation be forwarded to the president of the Board through his CO, one copy to the CO of the parent unit of the aircraft, and the other copy retained at Command HQ.

Confidential

RCAF CR 17
15M Pads of 100

TRANSIT SLIP

Serial Number.....

FILE REFERENCE C.21-46-9697

Charged to.....Date.....

DIRECTED TO

Registry Point	Staff Officer P.A. or B.F.	Date	Initials
CO		15/5	B.
CR	P.A.		

IF NEW FILE REQUIRED DESIGNATE SUBJECT

Transit Slips Are To Be Treated In Exactly The Same Manner As FILES.

Transit Slip Is Not To Be Buried Under Other Correspondence Or Detached.

000643

CONFIDENTIAL

Our file ref. S400-101 (CofS)

CANADA

DEPARTMENT OF NATIONAL DEFENCE

ROYAL CANADIAN AIR FORCE

Metz France
13 May 64

Chief of the Air Staff
Air Force Headquarters
Ottawa 4 Ontario

Board of Inquiry
Bristol Crash 30 Dec 63

1 The attached correspondence originated by this Headquarters and 1 Wing as a result of the Bristol Board of Inquiry is passed to your Headquarters in clarification of the AS/ATC situation at 1 Wing.

2 With reference to para 4 of 1 Wing's letter, F/S Martynuk has been recommended for release, and F/O Masternak has been removed from AS/ATC duties and recommended for repatriation and early termination of his SSC. Also, a review of all AS/ATC officers in this Command reveals that the talent is well apportioned between the wings and there is no reason to expect further difficulties. Therefore in the opinion of this HQ, the personnel situation is well in hand.

(RC Stovel) A/C
for AOC 1 Air Division

Encs-2

cc: 1 Wing RCAF

000644

AF G32 (REV. 8-57) 7530-21-801-6021

MESSAGE FORM

FOR COMMCEN/SIGNALS USE | FILE NUMBER

PRECEDENCE - ACTION	PRECEDENCE - INFO	DATE - TIME GROUP	MESSAGE INSTRUCTIONS
PRIORITY	DEFERRED		

FROM 1WG MARVILLE

TO CANAIRHED

CANAIRDIV
2WG GROSTENQUIN

INFO

PREFIX: GR

SECURITY CLASSIFICATION: CONFIDENTIAL

ORIGINATOR'S NUMBER: A 0650 31 DEC

COS PERSONAL 24 HOUR REPORT PD FURTHER TO CRASH MESSAGE A0649 from 2WG 31 DEC PD BRISTOL AIRCRAFT 9697 WAS ENROUTE GATWICK TO MARVILLE ON SF90 PD AIRCRAFT PASSED FROM MOSELLE CONTROL TO MARVILLE APPROACH AT 22 MILES AND ALTITUDE 4000 FEET PD GCA GAVE IDENTIFICATION TURN AND SUBSEQUENT APPROACH INSTRUCTIONS PD AIRCRAFT ON STRAIGHT IN APPROACH TO RUNWAY 12 PD APPROACH NORMAL PD AIRCRAFT ON GLIDE PATH AND GIVEN MINOR CORRECTIONS ONLY IN AZIMUTH PD SHORTLY AFTER ONE AND THREE QUARTER MILES FROM TOUCHDOWN AIRCRAFT DISAPPEARED FROM RADAR SCOPE PD CONTROLLER GAVE OVERSHOOT INSTRUCTIONS PD TIME 2056Z PD WEATHER AT BEGINNING OF APPROACH 200 FEET OVERCAST AND 4 MILES VISIBILITY PD DURING APPROACH SPECIAL WEATHER OBSERVATION OF

REFERS TO MESSAGE

DRAFTER'S NAME | OFFICE | TEL.

CLASSIFIED YES ☐ NO ☐

FOR OPR'S USE		DATE	TIME	SYSTEM	OPERATOR		DATE	TIME	SYSTEM	OPERATOR	RELEASING OFFICER'S SIGNATURE
	R					D					

MESSAGE FORM

FOR COMMCEN/SIGNALS USE

FILE NUMBER

PRECEDENCE - ACTION	PRECEDENCE - INFO	DATE - TIME GROUP	MESSAGE INSTRUCTIONS
PRIORITY	DEFERRED		

FROM

TO

INFO

PREFIX: GR

SECURITY CLASSIFICATION: CONFIDENTIAL

ORIGINATOR'S NUMBER: A0650 31 DEC

CEILING 150 FEET VISIBILITY 3 MILES PASSED TO PILOT PD GROUND SEARCH INITIATED AT 2110Z AND WRECKAGE LOCATED IN DENSE WOOD AT 2345Z PD DOCTORS ON SCENE REMOVED THREE SURVIVORS IMMEDIATELY AND CASUALTIES REMOVED APPROXIMATELY 0900Z PD SURVEY OF CRASH SCENE SHOWS AIRCRAFT STRUCK TREES AT ONE AND ONE HALF MILES FROM RUNWAY PD PORT STABILIZER AND SUNDRY BITS FELL OFF OVER 200 YARD DISTANCE PD AIRCRAFT SLEWED INTO TREES COMING TO REST OVER A FIFTEEN INCH DIAMETER TREE WHICH CRUSHED FULELAGE PD PORT ENGINE BURNED BUT NO EXTENSIVE FIRE PD IMPOSSIBLE TO ESTABLISH CAUSE PD INVESTIGATION IN PROGRESS

PAGE 2 OF 2 PAGES

REFERS TO MESSAGE

CLASSIFIED YES ☐ NO ☐

DRAFTER'S NAME: (AF AVANT) G/C

OFFICE: CO

TEL.: 1

FOR OPR'S USE		DATE	TIME	SYSTEM	OPERATOR		DATE	TIME	SYSTEM	OPERATOR
	R					D				

RELEASING OFFICER'S SIGNATURE: R Avant/S/L

DND 905
7530-21-562-1557

COPY 2

000646

R.C.A.F. D6
(10-7-55 (8860)

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ROYAL CANADIAN AIR FORCE

PROCEEDINGS OF

A

BOARD OF INQUIRY

INTO AN

AIRCRAFT ACCIDENT OR INCIDENT

INVOLVING

1 Aircraft Type Bristol Registration 9697

Place 1 Wing RCAF, Marville, France Date 30 Dec 63

Parent Unit 109 KU Flt, 2 Wing RCAF, Grostenquin, France

2 Board Convened By 166 A/V/M DAR Bradshaw, DFC, CD

Appointment Air Officer Commanding, 1 Air Division RCAF

Authority 1 Air Division Message P616 31 Dec 63

3 COMPOSITION OF BOARD [QR (Air)21.03]
(Include number, rank, initials, name, list/branch and unit)

President 27176 W/C OB Philip, Air/P, OC434 Str/R Sqn, 3 Wing RCAF

Member 33642 F/L SE Mayer, Air/P, 1 Air Divsion HQ

Member 24381 F/O GJ McDowell, TechAE, 1 Air Division HQ

Member 244784 F/L JAOA Savoie, MedMO, 3 Wing RCAF

Member 224524 F/L GOH Poulsen, TechAE (Flight Safety), 1 Air Division

4 TERMS OF REFERENCE [QR(Air)21.05]

(a) To investigate the circumstances leading up to and resulting in the accident to Bristol aircraft 9697 approximately one mile on approach to 1 Wing RCAF. Special attention is to be paid to :

(i) possible claim against the Crown;
(ii) report on all crash rescue facilities as referenced in ADI 21.57

(b) To make recommendations to prevent reoccurrence and if required, recommendations on other related aspects.

(c) Reference shall be made to the following :

(i) QR(Air) Art 21.09 to 21.15, 21.46 to 21.48, 21.55, 21.57 and 21.71

(ii) AFAO 21.46 and 21.56.01

(iii) RCAF Bulletin N° 33 as amended by amendement lists 1 to 4 inclusive.

(d) Security classification shall be Confidential

(e) The completed copies are to be delivered to the CO 1 Wing RCAF

5 CREW INFORMATION

AIRCRAFT Type/Number	CREW MEMBERS INVOLVED Crew Function	Number	Rank	Name	Unit	Class of Injury
Bristol 9697	1 Off.	30752	F/L	Clouthier VI	109 KUFlt 2 Wg	FAT L
	Capt	233004	"	Hamlen JK	"	FATAL
	Air/RN	30440	"	Johnson BL	5 AMU 1 Wg	FATAL
	Rad/Op	130045	"	Walshe EJ	109 KU Flt 2 Wg	FATAL
	Crewman	207748	LAC	Cougle	"	Nil ***
	Supy crew	20037	W/C	Middlemiss RG	427 St/R Sqn 3Wg	Nil ***

*** W/C Middlemiss N995.6, N825, 7 Y, N852 - Serious Injuries
*** LAC Cougle N852, N818 - Serious Injuries

6 PASSENGER INFORMATION

Number	Rank	Name	Unit	Flight Authority	Purpose	Class of Injury
27307	Sgt	Bach DAG	30 AMB Langar	AirDiv MVP	L	FATAL
Mrs	Dep	Middlemiss HL	3 Wg Zweibrucken	600	E	FATAL
Miss	Dep	Middlemiss D	3 Wg Zweibrucken	24 Dec 63	A	Nil ***
Mrs	Dep	Bach HM	30 AMB Langar	24	V	FATAL
Master	Dep	Bach DG	30 AMB Langar		E	FATAL

*** Miss Middlemiss N852 - Serious Injuries

7 FLYING HISTORY OF PILOTS (Nearest Hour)

NAME	TOTAL HOURS All Types	Instrument Cloud	Instrument Sim	LAST 90 DAYS Total Recip	Total Jet	On Type Involved Dual	On Type Involved 1st P	On Type Involved 2nd P	Instrument Cloud	Instrument Sim
F/L JK Hamlen	1075	189	211	130	Nil	Nil	130	Nil	8	.30
F/L VI Clouthier	5807	559	185	147	Nil	Nil	147	Nil	12	Nil

8 AIRCRAFT LOADING DATA

Basic Weight..... 30239 lbs
Max Permissible Take Off Weight..... 44000 lbs
Weight this Take Off..... 43998 lbs
Max Permissible Landing Weight..... 44000 lbs
Weight this Landing..... At time of accident 41838 lbs
Permissible C/G Range..... 280.5 inches Fwd 290.5 inches Aft
Calculated C/G Position at Time of Accident..... 285.7

9 That the evidence obtained by the BOARD is as set out in the evidence of the following 13 (Number) witnesses on the following 96 (Number) pages.

s.19(1)

01

CONFIDENTIAL

INDEX

 CONFIDENTIAL

ACCIDENT NARRATIVE

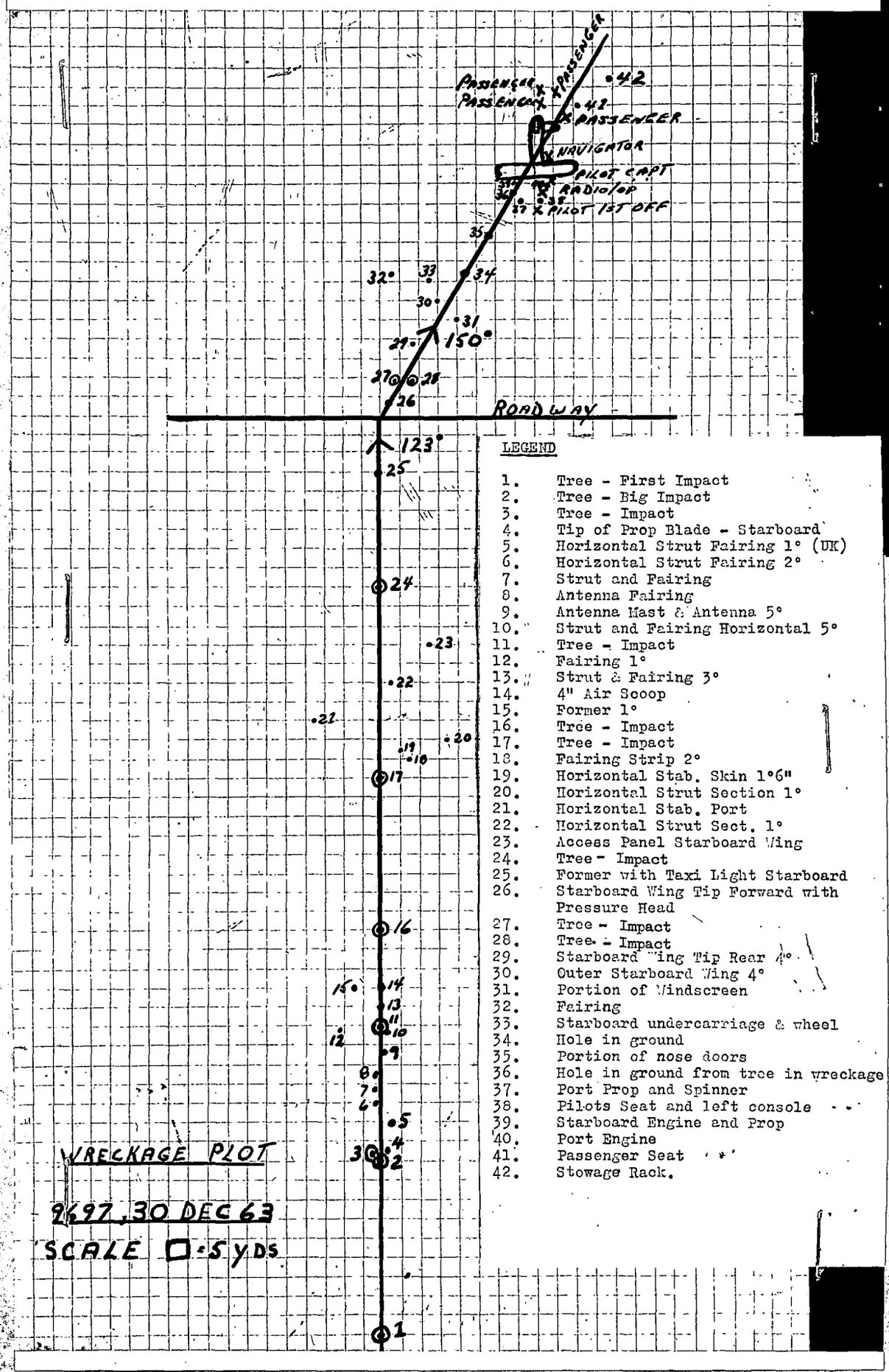
On 30 Dec 63, RCAF Bristol aircraft N° 9697, Service Flight 90 from Gatwick, England to Marville, France, crashed during a GCA approach at Marville. The aircraft was reported by the GCA controller as on the 'glide path' and making a correction in azimuth. Twelve seconds after passing the 1.3/4 mile mark, radar contact on the aircraft was lost. Time 2056Z.

Prior to commencing final approach, the weather at Marville was reported at 200 feet overcast with four miles visibility, but during the approach, a special weather observation was relayed to the pilots which gave the ceiling as 150 feet overcast with three miles visibility. Since contact with the aircraft could not be made, a ground search was started at 2110Z and the wreckage was located at 2345Z, in dense woods, one and one half miles from touchdown on the approach to runway 12. The aircraft was carrying six crew, five passengers and 5516 lbs of freight. There were three survivors.

Appendix "B" to
Board of Inquiry
Convened at 1 Wing RC
Marville, France on
31 Dec 63

WRECKAGE PLOT
(from initial impact)

CONFIDENT



LEGEND

1. Tree - First Impact
2. Tree - Big Impact
3. Tree - Impact
4. Tip of Prop Blade - Starboard
5. Horizontal Strut Fairing 1° (UK)
6. Horizontal Strut Fairing 2°
7. Strut and Fairing
8. Antenna Fairing
9. Antenna Mast & Antenna 5°
10. Strut and Fairing Horizontal 5°
11. Tree - Impact
12. Fairing 1°
13. Strut & Fairing 3°
14. 4" Air Scoop
15. Former 1°
16. Tree - Impact
17. Tree - Impact
18. Fairing Strip 2°
19. Horizontal Stab. Skin 1°6"
20. Horizontal Strut Section 1°
21. Horizontal Stab. Port
22. Horizontal Strut Sect. 1°
23. Access Panel Starboard Wing
24. Tree - Impact
25. Former with Taxi Light Starboard
26. Starboard Wing Tip Forward with Pressure Head
27. Tree - Impact
28. Tree - Impact
29. Starboard Wing Tip Rear 4°
30. Outer Starboard Wing 4°
31. Portion of Windscreen
32. Fairing
33. Starboard undercarriage & wheel
34. Hole in ground
35. Portion of nose doors
36. Hole in ground from tree in wreckage
37. Port Prop and Spinner
38. Pilots Seat and left console
39. Starboard Engine and Prop
40. Port Engine
41. Passenger Seat
42. Stowage Rack.

Appendix "C" to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

5

WRECKAGE PLOT
(main wreckage)

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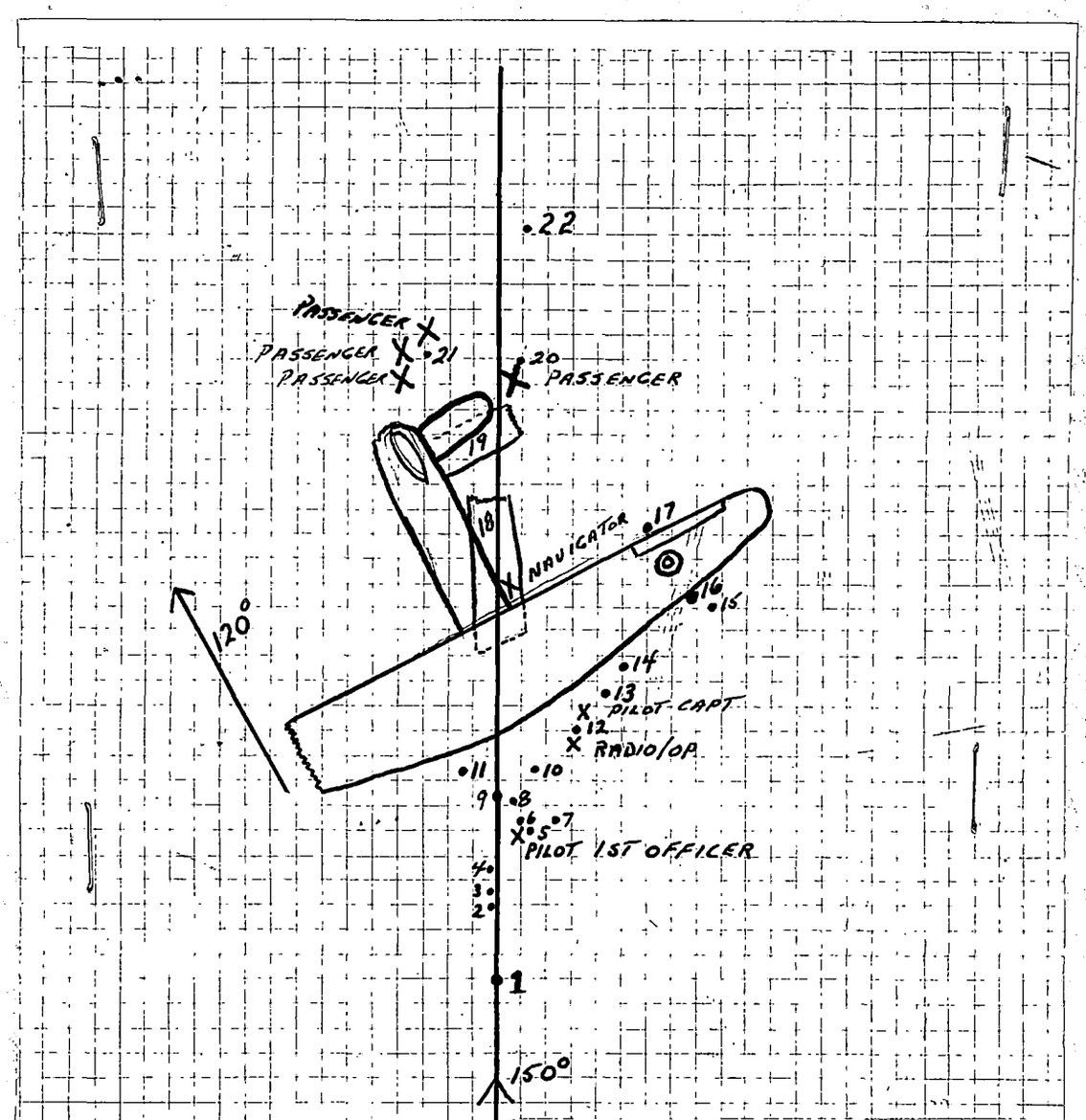

LEGEND

1. Hole in ground (starboard wing)
2. Portion Nose doors
3. Part of Janitrol heater
4. Oil tank starboard & part of Janitrol Heater
5. Turn and Bank indicator and artificial horizon
6. Pilots seat and left console
7. C/O window
8. Port prop and spinner
9. Hole in ground from tree in wreck, Navigator's seat & crew ladder in hole
10. Cockpit area
11. Starboard engine and prop
12. Port engine
13. Top of centre front C/O area
14. Oil tank port
15. Oil cooler port
16. Tree - impact
17. Tree - impact
18. Cargo and 19ft of floor area (overturned)
19. Rear floor area 14ft
20. Stowage rack.
21. Passenger seat
22. Batteries aircraft

WRECKAGE PLOT

9697 30 DEC 63

SCALE □ · 5 FEET

 CONFIDENTIAL

The first witness 216344 F/L MALONEY-CHUMNEY having been called and duly sworn states :

I am 216344 F/L Raymond Patrick MALONEY-CHUMNEY, Pers/AFSec, employed as Wing Security Officer at 1 Wing RCAF, Marville, (Meuse), France.

I reside at the Maple Leaf Trailer Park, just opposite the main entrance to 1 Wing RCAF, At approximately 2105Z, 30 Dec 63, I saw crash trucks going north from the Wing main gate on Highway N405. I reported immediately to the Guardhouse and was advised that an airman was just leaving to call me in. Sgt Hawkes, the duty AFP NCO advised me that a Bristol aircraft had presumably crashed while attempting to land. Sgt Hawkes stated that it was not definitely known whether or not the aircraft had indeed crashed, as it had previously enquired about the weather at Etain AFB and could have diverted there. Sgt Hawkes further stated that the last known position of the aircraft was between Han-les-Juvigny and Juvigny-sur-Loison. I then told Sgt Hawkes that I would control the AFP action.

At 2110Z I dispatched LAC Grady (AFPmn) to instruct all available personnel from single quarters to report immediately to the Guardhouse for ground search duties. At this time I also dispatched all available personnel in vehicles to patrol the roadways between Ire-le-Sec, 1 Wing RCAF, Juvigny-sur-Loison, Han-les-Juvigny and Mon Ire de l'Ambuscade in an attempt to locate the aircraft or any personnel from the aircraft who might find their way to a roadway. I instructed the searchers in AFP radio vehicle N° 61A-23 to move to Ire-le-Sec and all other vehicles were to be advised that radio communication between the search area and 1 Wing RCAF was available from Ire-le-Sec.

Sgt Hawkes then advised me that RAPCON advised that the aircraft had gone off the radar screen in the "BROWN" area (the area we were already searching by roadway). (See Yukon Disaster Plan map).

I then called 5 AMU and was advised that there were six passengers and five crew aboard the aircraft. I called the hospital and gave them these figures so that they could have sufficient personnel etd., available. I then dispatched two additional four-wheel drive vehicles to patrol the highways. I also notified W/C Bodien (COpsO) that I was preparing for a ground search.

RAPCON called and stated that the aircraft had disappeared from the radar screen 1.3/4 miles from the west end of the main runway. I therefore dispatched a number of personnel with one flare pistol to start walking west from the runway lights along the line of approach to the runway. AFPmn accompanying the searchers carried 9mm pistols as signalling devices as the flare pistol would be of little use because of the fog and the dense bush. Additional searchers were obtained from the Maple Leaf Trailer Park. I then ordered sandwiches and coffee for the search parties. I was advised that the Montmedy Gendarmes were sending patrols to the area. I was also advised that Lt. Jausset, OC of the Montmedy Brigade of Gendarmerie was en-route to the Wing. All additional searchers were therefore held pending his arrival.

I then spent my time getting equipment for the search - flare pistols and flares, parkas, lights, transport, food, etc., and instructed all AFPmn of the agreed signalling system.

(RP Maloney-Chumney) F/L

 CONFIDENTIAL

At approximately 2235 hours, Lt Jausset arrived and the details were given to him. I asked him to take command of the field search. It was agreed to establish the field headquarters at the forest ranger tower at Mon Ire de l'Ambuscade and search the area south and south east of the tower and join up with the search then in progress. W/C Bodien arrived and marked the most likely crash area on the Yukon Disaster plan map.

I advised Lt. Jausset that I would move the AFP radio vehicle to the field search headquarters to provide him with necessary communications with 1 Wing RCAF. Lt. Jausset then departed with his gendarmes and about fifty airmen.

I then requested permission from W/C Bodien to move the two four-wheel drive ambulances to the field search headquarters. Permission was given and the ambulances reported with S/L Carriere (SMO) and DR Creighton to the Guardhouse. They were briefed on the situation and asked to transport additional personnel to the search headquarters.

I was then kept busy with briefings, rounding up additional search personnel, etc., until Sgt Hawkes (AFPmn) reported to the Guardhouse that the aircraft was located. He stated that three passengers were alive and it appeared that the remainder were dead. He also stated that there was no fire at the accident scene. I instructed him to give the details to the field search headquarters so that the ambulances could be moved to the crash scene. I passed what limited information I had to the tower (I believe it was to G/C Avant, CO 1 Wing RCAF). Sgt Hawkes returned to the scene to guide the ambulances and W/C Bodien reported to the Guardhouse. I dispatched Cpl Billingham (AFPmn) with W/C Bodien and a supply of accident flares to the scene to mark the area.

I should like to state that the times given above are approximate times. I was too busy to maintain an accurate record. However, just after Sgt Hawkes reported finding the aircraft I was advised that approximately 100 additional gendarmes were being dispatched to assist in the search. I had these people notified that they were not required.

Q 1 At what time approximately were you advised that the crashed aircraft had been located?

A 1 I believe that it would be approximately 2340Z.

Q 2 Is it standard procedure at 1 Wing RCAF, that you, as Wing Security Officer, or your representative, control the ground search party?

A 2 There is nothing laid down specifying that the WSecO will take command of such a search party; however, I feel that the police officer, because of his familiarity with off-wing areas and his liaison duties with local national police officials, is the most suitable person to assume these responsibilities. Almost all the woods in this district are owned by the French Government and Gendarme participation in such a search is mandatory.

Q 3 Who owns the property in which the aircraft crashed?

A 3 As far as I know it belongs to the French Government.

Q 4 Do you know who first found the crash scene?

A 4 I have since been informed that Cpl Zigarlick, AFP was led to the scene by the shouting of an injured person, Miss Middlemiss.

(RP Maloney-Chumney) F/000654

CONFIDENTIAL

Q 5 Is the Yukon Disaster map the only crash map for 1 Wing RCAF?

A 5 No, we do have a more detailed map for on-wing crashes; however, it is the only available map for off-wing crashes.

Q 6 Are there any laid down procedures or plans for initiating a ground search for off-wing crashes?

A 6 Not to my knowledge.

Q 7 Do you have a copy of the Yukon Disaster plan map in your office?

A 7 Yes.

Q 8 Are you satisfied that your section are adequately briefed, trained and equipped to conduct emergency searches for crashed aircraft in the 1 Wing RCAF area?

A 8 I feel that the Air Force Police are as well briefed as they can be on the terrain surrounding 1 Wing RCAF. The AFP conduct off-wing security patrols of the area and so become familiar with the local terrain. I also feel that a formal course of instruction should be made available for Pers/AF Security Officers and AFP Sr NCOs in the conduct of ground searches. This year there have been seven fatal motor vehicle accidents in the 1 Wing RCAF area and the two AFP vehicles available are adequately equipped with rescue equipment. However, communications are inadequate. I recommend that walkie talkies be provided to AFP sections overseas for normal duties.

(RP Maloney-Chumney) F/L

The second witness [redacted] having been called and duly sworn states :

I am [redacted] employed as a GCA controller at the RAPCON unit, 1 Wing RCAF, Marville, France.

I reported for duty at RAPCON at 1530Z on 30 Dec 63, relieving the day crew. I was informed by this crew that the RAPCON was off for routine maintenance until 1530Z. I checked with the GCA radar technician on this matter and was informed by him that it was back in service. I checked the radar and found it to be serviceable and logged it as such. From this time, until approximately 2000Z I remained on duty in the standby room. At approximately 2000Z I was informed by the Tower of an inbound B170. A check was made on the radar, which was found to be serviceable and at approximately 2040 Z I accepted the aircraft in my control and carried out a normal GCA run. At 2056Z the aircraft was lost on radar one and three-quarter miles from touch down - a missed approach was given and the Tower advised.

Q 9 When were you last on duty prior to the 30 Dec 63?

A 9 On 5 Dec 63.

Q 10 Where had you been between the 5 & 30 Dec 63?

A 10 I was in London, England, on leave.

Q 11 Is it normal to return from leave after such an absence and to have your first shift at night?

A 11 I understand that it is normal here, but I haven't been here that long to know the system. The controllers have gone on leave and then gone back to their normal shift.

Q 12 Who is your immediate superior in GCA?

A 12 [redacted] is NCO i/c, Sgt Hughes was Crew Chief for that shift.

Q 13 How long have you been a qualified GCA operator?

A 13 I passed my GCA course in November of last year.

Q 14 That was November 1962?

A 14 Yes, 1962. On completion of the course I was transferred to RCAF Station Greenwood and in that time I got station limits at Greenwood, then I was transferred on 1 Jul 63 to this wing. From 1 Jul 63 I spent approximately two months in the Tower here and in Sep 63 I went to the radar unit. From that time until now, I got the limits. F/L Harvey did the flight check on me on 28 Oct 63.

Q 15 When are you due to have your next flight check?

A 15 28 Jan 64.

Q 16 Can you remember which crew was on duty with you on 5 Dec 63?

A 16 Sgt Murray was Crew Chief and Cpl Duff was also in.

[redacted]

Q 17 You say that the aircraft was lost on radar at one and three quarter miles from touchdown?

A 17 Yes, that's right.

Q 18 Would you describe to the Board exactly what you mean by "lost"?

A 18 At the one and three quarter mile mark, the target was in elevation and azimuth and then what I did during the next few seconds, I do not know, I could have checked the wind and the Tower light. This is automatic and looked back at my scope, I did not see any target. And then to say I did this, I am not sure. My first reaction was to say that I lost radar and I gave missed approach instructions, rather I told him to carry out his missed approach, and this is split seconds afterwards, and then doing an immediate radar check, I found that I had radar. There are four things that you check:

(i) Radio
(ii) Cursors
(iii) Range marks
(iv) Radar intensity.

Q 19 What is your impression of the time, in seconds, that it took for radar contact with the aircraft to disappear from the scope?

A 19 That is a hard question to answer - no more than three seconds.

Q 20 Had you ever previously lost radar contact with an aircraft on final GCA?

A 20 I have with a radar failure.

Q 21 Is that complete radar failure?

A 21 That's complete radar failure.

Q 22 How often have you had radar failure?

A 22 Several times in Greenwood, but as far as I can remember, no more than once here.

Q 23 Would you explain to the Board what happens when you have a radar failure?

A 23 Everything is blanked out on your scope, except the intensity. I have experienced cursor movement and range markers leaving the scope.

Q 24 During control of aircraft N° 9697 on 30 Dec 63, did you use STC (Sensitivity Time Control)?

A 24 Well, I can't say as to this. I can't remember, but 99% of the time I do use it. When it hits four or five miles, your hand automatically hits the switch.

Q 25 You are absolutely positive that at one and three quarter miles aircraft N° 9697 was on the glide path and correcting in azimuth from the left to the on-course?

A 25 Yes sir.

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Q 26 The Board has noted from the tape recording that the aircraft intercepted the glide path at six and three quarter miles. Did this have any particular significance to you as the operator?

A 26 Numerous times the aircraft intercept the glide path from the six and three quarter to the five mile mark.

Q 27 What gain setting do you normally use with an aircraft on GCA final?

A 27 I use high gain and STC (Sensitivity Time Control).

Q 28 On the initial check of your set, what range setting do you usually have on the surveillance scope?

A 28 Usually thirty miles, sir.

Q 29 Do you remember this setting on your check of the scope that afternoon?

A 29 No sir.

Q 30 Do you usually recheck the distance setting prior to a run?

A 30 No sir.

Q 31 Do you remember setting the distance setting on the surveillance radar during your check upon coming on duty on the afternoon of 30 Dec 63?

A 31 I think I did sir.

Q 32 Do you remember changing it at any time in the interval between your initial check and picking up Bristol N° 9697 that same day?

A 33 When I was picking up the Bristol I must have changed the setting at that time. That is, when I was advised of the Bristol, I went to the set and checked in a westerly direction toward Cocoa Hotel (Chatillon NDB 75 NM West), and I am quite sure that I changed it.

Q 33 To what range?

A 33 To the sixty mile.

Q 34 Did you change it back?

A 34 After accepting control I went to thirty miles.

Q 35 Did you hear a play-back of the tape of the Bristol run after the aircraft was missing?

A 35 Yes, before the tape was impounded, I went back and heard the last part of the run.

Q 36 How much of the last part of the run? Eleven miles, five miles?

A 36 Oh no sir, less than that, only far enough back to confirm when I lost the aircraft. Two and one half was what I said, but it was at one and three quarters.

Q 37 Were you alone when you played the tape back?

A 37 Yes sir.

[redacted]

Q 37 Would you normally do this?

A 37 Right at that time there was no indication that the aircraft had crashed.

Q 39 Would you describe to the Board the scope presentation while controlling aircraft N° 9697 on final, in terms of target return or any weather that may have been on the scope?

A 39 There was precipitation on the scope. I don't think it came in too far. I am not sure of this.

Q 40 Was it light or heavy?

A 40 It was moderate and the target return was weak, but a readable and acceptable target.

Q 41 In terms of length, approximately how long a radar return were you getting?

A 41 I can't remember.

Q 42 You came on duty at 1630 hours on 30 Dec 63. Would you explain to the Board what your personal activities were during the previous 24 hours?

A 42 On 29 Dec 63, all afternoon in the Control Tower and talking to the controller on the "B" stand - I went to check the shift over at RAPCON, then I bought a new record and that night I listened to the record. I went to bed roughly 1130 pm to 1200. On 30 Dec I got up at approximately 10 o'clock and went for dinner at 1130 o'clock. In the afternoon, around 1.30 pm - 2 pm, I went to the Snack Bar and had a coffee with one of the Sgts from RAPCON. After this I went back to my room in barracks , got dressed and proceeded to work.

[redacted]

The second witness, [redacted], recalled for further questioning and reminded that he is still under oath, states in answer to questions:

Q 43 Your last transmission to the tower after the crash was "I am going in there and get the precision back on the air again". Would you explain to the Board what you meant by this statement?

A 43 I don't remember exactly, but I think I was trying to impress upon myself that the set was unserviceable.

Q 44 You previously advised the Board that when you lost radar contact your first thought was that you had lost your (A) radar. How soon after losing radar contact with the aircraft did you confirm to yourself that the radar set (A/C) was in fact functioning?

A 44 A matter of seconds.

Q 45 On your flight check for qualification for station limits on the 28 October, was your check conducted on the precision or on the quad radar?

A 45 I had four runs that day. Three were on precision and one was on Quad. That is to the best of my memory.

[redacted]

EXEMPTION/EXCEPTION 19(1)
ACCESS TO INFORMATION ACT/
LOI SUR L'ACCÈS À L'INFORMATION

CONFIDENTIAL

The third witness [redacted] having been called and duly sworn states :

I am [redacted] employed as Crew Chief at the RAPCON unit, 1 Wing RCAF, Marville, France.

Q 46 Are you in charge of all GCA controllers at this base?

A 46 Yes sir.

Q 47 Are you then responsible for the direct supervision of the controller's training and operating techniques and procedures?

A 47 Yes sir.

Q 48 Would you brief the Board on your experience as a GCA operator?

A 48 I have approximately eleven years experience as a qualified GCA controller. Approximately 9060 runs.

Q 49 Would you brief the Board of your assessment of [redacted] ability as a GCA controller?

A 49 [redacted] arrived at the unit for instructional purposes in Aug 63. On arrival at the Air Division all trainees or new personnel are given complete alignment checks of all phases of the operation, i.e. technical operation of the unit plus all local operating procedures before a controller is allowed to operate in any way at all. [redacted] has had over 350 runs at Marville up to this date. Employed on initial training, [redacted] was on straight day shift for approximately five weeks, under direct supervision of the Chief Radar Controller (myself) and a continuation of day and night duty as flying permitted for experience. This was to enable him to acquire maximum experience. Prior to his flight check, [redacted] was supervised and assessed by all controllers at Marville RAPCON. He was flight checked on 28 Oct 63. [redacted] has adequate experience, more so with conventional aircraft than jets. On completion of his flight check he was de-briefed, which was carried out by Wing Instrument Flight, they were even more than pleased with the results. On the flight check, [redacted] was given five completed runs and including emergencies. I would conclude by saying that all controllers who have worked with [redacted] are pleased with his work.

Q 50 Are there any areas in [redacted]s operating techniques that could be improved to your knowledge?

A 50 Not in actual radar operations. He has a minor phraseology problem but it does not affect his overall controlling.

Q 51 Have you noticed that [redacted] consistently uses a higher gain control than required when controlling an aircraft on GCA final?

A 51 No, I wouldn't say so, sir, certainly not the point where it is dangerous.

Q 52 Would you explain to the Board the danger of using too high a gain setting?

[redacted]

 CONFIDENTIAL

A 52 The dangers of too high a gain setting would minimize the target presentation close in at your critical point, say a mile from the touchdown point.

Q 53 Do we take this to mean then, that with an excessively high gain setting that it would be difficult to determine the exact position of the aircraft in relation to the glide path?

A 53 Yes.

Q 54 With your knowledge and experience, have you ever had an aircraft target disappear from the precision scope instantaneously?

A 54 No, not in actual experience, not on precision.

Q 55 Is there any set of conditions that you know of that could cause a target or a return to disappear from a scope?

A 55 No, you either have radar or you don't.

Q 56 What is the interval of time between flight checks on qualified controllers?

A 56 On transfer to a radar unit, there is not setdown breaking-in period, the controller is familiarized with the local operating procedures and when the supervisor is satisfied he is given his initial flight check. After the initial flight check the controller operates for a three month period and then is given another flight check. On successfully passing the second flight check, he is qualified for a period of six months before the next check.

Q 57 Who is your immediate supervisor?

A 57 F/L Ruttle, OC RAPCON.

[redacted]

CONFIDENTIAL

The third witness [redacted] recalled for further questioning and reminded that he is still under oath, states in answer to questions:

Q 58 What was the date of your last proficiency flight check?

A 58 In October 63.

Q 59 Who assessed your proficiency on this check?

A 59 F/L Ruttle.

Q 60 On your previous statement you advised the board that you had approximately 11 years experience as a qualified GCA controller, yet the board notes from your records that you did not complete the course until 17 May 54. Is this date correct?

A 60 Yes.

Q 61 Further to the above question you stated that you had been qualified through this period. Does this mean that you have had station limits continuously since 1954?

A 61 No I haven't ... there were breaks because I was at Command at Trenton employed with the GCA flight check team for approximately a year and a half. This was covering all transport units.

Q 62 Then can you advise the board how many years out of the past ten you had station limits, an approximate answer will do.

A 62 All except 2½ years Sir, approximately 3 years.

Q 63 Can you produce your controllers log book for the Board?

A 63 No Sir, I can't, not my original book. It was lost shortly after I was transferred to Trenton in 1959 or maybe late in 1960 it disappeared I don't know where.

Q 64 Did you report this loss to the RCAF authorities?

A 64 I reported it to the SFCO at Trenton.

Q 65 Have you had a replacement log book since that time?

A 65 I am trying to make a new book from the totals I had in the old book. We get these from the monthly reports.

Q 66 When did you start making up this new book?

A 66 When I came over here.

Q 67 Who has been verifying your proficiency checks and insuring that your monthly runs are recorded properly?

A 67 F/L Ruttle Chief Controller RAPCON and also it is signed by SATCO on the monthly reports.

[redacted]

CONFIDENTIAL

Q 68 On [redacted] initial flight check on 28 Oct 63 was this check on the Quad or Precision radar?

A 68 That was on precision radar.

Q 69 Have any of your superior officers raised adverse criticism of your supervision or management of tho GCA unit here at 1 Wing?

A 69 There was some criticism raised on the last R2llA. This wasn't really directly on/raddr control. It boils down to admin administrative criticism because we never get much opportunity to administer a unit.

Q 70 When was the last time that you were subjected to supervision as a Radar Controller?

A 70 At RCAF Stn Trenton in 1960 and that was strictly as a crew chief.

Q 71 When you completed your GCA course and were transferred to Stn Gimli did you attain Station limits?

A 71 Yes I did Sir.

Q 72 You were transferred to Stn Moose Jaw in Nov 55. While on this Stn were you employed as a GCA operator. Did you attain Station limits there?

A 72 No, there was no GCA there and I was only there a short period and then I was posted overseas.

Q 73 How long did it take you to attain Station limits at 2 Wing after starting work in GCA?

A 73 Approximately 3 to 6 weeks after I started to work in the GCA unit.

[redacted]

CONFIDENTIAL

The fourth witness; 27585 F/O JE Blythe having been called and duly sworn states:

I am 27585 F/O JE Blythe, employed as Deputy Telecommunications Officer at 1 Wing RCAF, Marville, France.

Q 74 The Board understands that the GCA unit here at 1 Wing RCAF was shut down for maintenance on 30 Dec 63. Would you explain to the Board the reason for the shut down and the time this took place?

A 74 The time the unit was closed down was 1200Z to 1530Z. The purpose of this was to carry out preventative maintenance and this is done weekly on the same day at the same time.

Q 75 Would you explain to the Board the maintenance work carried out on this day?

A 75 Yes, I have the daily maintenance log on the unit which indicates the work carried out which I submit to the Board (Exhibit 1).

Q 76 Who carried out this work?

A 76 The work was carried out by Sgt Meisner and LAC Gallay.

Q 77 Was any of the work carried out considered major maintenance?

A 77 No.

Q 78 Did any of this maintenance work involve the antenna systems?

A 78 No.

Q 79 Do minor variations in power fluctuations affect the technical operation of the GCA set?

A 79 No, because the equipment in the trailers is regulated and will stand some tolerance.

Q 80 Was the GCA flight checked after this maintenance?

A 80 No, it never is after weekly maintenance.

JE Blythe
(JE Blythe) F/O

CONFIDENTIAL

CRASH AREA MAP

Appendix "A" to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

HARES HAVE SIDES OF ONE MILE

CONFIDENTIAL

19

Exhibit 1
To The Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

PHOTOSTATIC COPIES OF RAPCON MAINTENANCE FACILITY LOG

FLYING CONTROL LOG BOOK

RAPCON. MAINT. FACILITY DATE DEC. 30. 19.63

TIME	DETAILS	ENTERED BY
0001	Converter generator stoped for no	
	reason!	
0004	Started again	
0006	Unit switched on.	
0015	Unit servicable ~~for~~ BACKUP [illegible]	
0530	Electrician started diesel.	
0600	FDF OFF APU ON.	
0625	RADAR TUNED UP & WORKING OK.	
0720	BACK TO FDF.	
0740	RADAR SERVICEABLE	
0830	Lac Madeau off duty	
0815	Sgt Meisner & Lac Gallays on duty	
0900	Map gen #3 U/S defective	
	range mark on left side of	
	main Bang.	
	changed V 10702 - [illegible]	
	tried in service & OK.	
1300	Weekly Maint	
	PM on 'X' TRANS mod #766	
	Replaced missing bulbs in	
	'S' indicator	
	Tuned S & X radar	
	Working on TACAN	
1130	Radar back on the air	
	Found SCR-2 shorted in Ant Cont.	
	module (TACAN) no spares	
1700	Day Crew off duty	
1630	Budgell on duty. Tuned	
	up "S" & "X"	
1730	Completed PM's on CVG (spare)	
	P.S #745 & SIF decoder	
	#12C. Tried in service and	
	now ok.	
2200	Cpl Days running a	
	aircraft at 2200 and lost	
	radar contact at 2202. Now	
	searching for aircraft.	

FLYING CONTROL LOG BOOK

RAPCON. MAINT. FACILITY DATE DEC. 3[illegible]. 19.63

TIME	DETAILS	ENTERED BY
0001		
0830	Meisner, Epple on, Budgell	
	off.	
1310	Unit Rotator off air JFN.	
	Sgt Birnell	[illegible]
1430	Replaced 15 min timing motor	
	& switch in Alden Recorder &	
	now svble.	[illegible]
	Day Crew off duty	
1700	Gallays on duty.	
	End of day & Year	

CONFIDENTIAL

The fifth witness 212396 LAC JW Marshall having been called and duly sworn states :

I am 212396 LAC JW Marshall employed as a GCA controller at 1 Wing RCAF, Marville, France.

Q 81 Were you on duty at GCA on 30 Dec 63?

A 81 Yes sir.

Q 82 The Board understands that the GCA unit was shut down for maintenance during the afternoon of the 30 Dec 63 and that shortly after the unit was declared serviceable it was flight checked. Who did the fe controlling for this flight check?

A 82 I did. The flight check was done just prior to the unit being back on the air and declared serviceable. I did not consider this run a flight check, it was a normal run because the weather was coming down and the aircraft had to get in. It is only flight checked after annual maintenance.

Q 83 Did the GCA equipment operate satisfactorily in all respects during this run?

A 83 Yes it was satisfactory. I did a scope alignment just prior to the run and everything was satisfactory during the run.

Q 84 To your knowledge, was there any adjustment made to the GCA equipment after this run and the time you went off duty at approximately 1600Z?

A 84 No sir, not to my knowledge.

Q 85 How long have you been a qualified GCA controller at Marville?

A 85 Approximately 2½ years.

JW Marshall

(JW Marshall) LAC

CONFIDENTIAL

The sixth witness 237260 F/L KA Harvey having been called and duly sworn states :

I am 237260 F/L KA Harvey, employed as Officer Commanding, Wing Instrument Flight at 1 Wing RCAF, Marville, France.

Q 86 The Board understands that you were flying a T-33 aircraft and did a GCA run at 1 Wing RCAF at approximately 1545Z on the 30 Dec 63, which was the first run after a maintenance shut down. Could you advise the Board if this run was satisfactory in all respects?

A 86 Yes sir, I even called the GCA operator up to tell him that it was.

Q 87 What were the weather conditions at the time of the run?

A 87 I think they were approximately 1000 ft and six miles.

Q 88 At what point then on the approach, were you VFR?

A At approximately four miles.

Q 89 Are you familiar with the GCA controlling of Cpl Frye?

A 89 Yes, sir, I ~~h~~ gave him his unit check here and it was excellent in all respects.

KA Harvey

(KA Harvey) F/L

The seventh witness 67126 F/L RG Catling having been called and duly sworn states:

I am 67126 F/L RG Catling, employed as Met Officer at 1 Wing RCAF, Marville, France.

On 30 Dec 63 a large scale high pressure area prevailed over France and Germany giving light southerly winds and a marked low level temperature inversion with warm dry air aloft and cool moist air at low levels.

CLOUD AND VISIBILITY: Overcast stratus cloud was based at 1000 to 2000 feet MSL with tops at the base of the inversion 2000 to 2500 feet MSL. The ceiling at Marville lowered from 800 feet at 1600 Z to 100 feet by 2100Z. The lowering from 300 to 100 feet after 2000Z coincided with a visibility change from ½F to 1.5F. At the same time the ceilometer record indicated a ragged variable base and a variable intensity of light return which could be interpreted as an occasional thin overcast condition. It was also noted that at times there was considerable illumination by the moon through the cloud although the light was diffuse and no outline of the moon was visible. This would also indicate that the cloud thickness was variable.

WIND AND TEMPERATURE: The surface wind was southerly at three knots and the temperature - 1.5°C. The temperature aloft decreased to -4C at 2500 feet then increased to 4 at 3000 feet. Winds in the cold air surface to 2500 feet, were light southerly and above the inversion were 240 deg at 20 Kts. The wind shear was 20 Kts per 1000 feet between 2500 and 3500 feet MSL.

ICING: There would have been light rime icing in the stratus cloud with possible occasional light clear icing in the base of the cloud. Carburetor icing should also be considered a possibility.

A copy of the forecast for Marville and actual from 2000Z, 30 Dec 63 is presented to the Board (Exhibits 11 & 111).

Q 90 The weather observation taken at 2045 Z on 30 Dec 63 indicates 100 overcast and three miles visibility. However the weather passed to aircraft N° 9697 at this time was given as 150 feet and three miles. Would you explain how this discrepancy of 50 feet occurred?

A 90 It is possible to read ceilings from the ceilometer tables in degrees of elevation of the ceilometer beam. The corresponding heights of the cloud base in feet are calculated trigonometrically. The observing procedure requires that the ceiling be given to the nearest 100 feet. However, the report to the tower could be the exact reading.

Q 91 Was there any freezing precipitation reported in the 1 Wing area?

A 91 There was none reported or expected.

(RG Catling) F/L

CONFIDENTIAL

EXHIBIT "H"

TO THE BOARD OF INQUIRY
CONVENED AT 1 WING, RCAF,
MARVILLE, FRANCE

31 DEC 63

FORECASTS FOR MARVILLE 30 DEC 1963 DISTRIBUTED BY RCAF MESSAGE TO GATWICK

VALID 06-24Z	C1XO.2L-F	220/05	
	GRADU 10-12Z	C5⊕1.5F	220/06
	GRADU 12-14Z	8⊕C15⊕25⊕03H	220/06
	GRADU 19-22Z	C5⊕25⊕01F	VRBL/03
AMENDED 07-24Z	ADD TEMPO 07-11Z	C3⊕1.0F	CALM
VALID 12-12Z	4⊕C8⊕6	180/03	
	TEMPO 12-20Z	C4⊕8⊕5F	180/05
	GRADU 20-22Z	C1XO.1F	200/05
AMENDED 13-12Z	C8⊕12⊕6	180/05	
	GRADU 17-20Z	1.9F	
	GRADU 00-03Z	C4⊕0.2F	180/05
VALID 18-18Z	C4⊕7⊕6	180/05	
	GRADU 20-22Z	2F	
	GRADU 02-04Z	C2XO.2F	200/03
	GRADU 11-13Z	C4⊕0.8R-F	200/05
	GRADU 16-18Z	10⊕C20⊕3F	220/10

THE FOLLOWING ARE TAFS FOR FRANCE, GERMANY AND BENELUX THAT ARE NEAR ALTERNATE LIMITS.

VALID 301300-302200Z

EDDL	C12⊕2.7	220/05
GRADU 16-20Z	15⊕C8⊕3	180/15
TEMPO 20-22Z	C10⊕2.7R-	

VALID 301200Z-302100Z

LFPO	C12⊕3⊕2.7F
INTER 12-18Z	C20⊕

LFML & LFMN FORECAST ABOVE LIMITS

VALID 301600Z-310100Z

EDDL	C10⊕2.7
TEMPO	4⊕C6⊕1F

EDDK	C15⊕3	180/05
VALID 15-24Z	LFPO	C12⊕3F 180/10
	LFML	GRADU 18-21Z 1.6F
	LFMN	ABOVE LIMITS
VALID 18-03Z	LFPO	FCST BELOW LIMITS
	LFML	BELOW LIMITS
	LFMN	ABOVE LIMITS

VALID 301200Z-302400Z

LFQG	GRADU 15-18Z	C12⊕20⊕2.5HF	240/05
	GRADU 20-24Z	-X 1-0HF	

CONFIDENTIAL

EXHIBIT 111

TO THE BOARD OF INQUIRY
CONVENED AT 1 WING, RCAF
MARVILLE, FRANCE

31,DEC 63

MARVILLE WEATHER

DEC	302000Z	REGULAR	C3⊕4F	
	302005Z	CHECK	C2⊕4F	REQUEST BY TOWER
	302045Z	SPECIAL	C1⊕3F	REQUEST BY TOWER
	302100Z	REGULAR	C1⊕3F	
	302110Z	CHECK	C1⊕3F	CRASH CHECK
	302120Z	SPECIAL	C1⊕1.4F	
	302200Z	REGULAR	C1⊕1.5F	

ALL CEILINGS ABOVE MEASURED

302100Z	LFQE	C7⊕7
	LFQC	C7⊕3F
	EDAW	C7⊕2.5HF
	LFQG	C3⊕1.3F

 CONFIDENTIAL

The eighth witness, 62529 LAC RG Budgell having been called and duly sworn states;

I am 62529 LAC RG Budgell employed as Radar Tech Ground on Navigation Aids at 1 Wing, RCAF, Marville, France.

Q 92 Were you on duty as the GCA Tech on the evening of 30 Dec 63

A 92 I was on duty from 1600 hours until 0830 hours 31st Dec 63

Q 93 Was there any requirement to carry out any technical work of any kind on the GCA equipment during your period of duty

A 93 When I arrived at the unit it was on maintenance at that time and an operator notified me that search was weak and I tuned up both search and precision. Then the Sgt previous to leaving asked me to complete preventative maintenance on some spare chassis. I completed preventative maintenance of such. I set grass level a little higher and an operator requested that it be reduced, which I did. There was no further work carried out by me on the equipment

Q 94 Did [redacted] appear nervous or upset that evening

A 94 No, he didn't show any signs of nervousness. I was wondering why the shift was made up in such a manner that he would be put on nights on completion of leave. That is, why he was by himself and not on days so that a supervisor could check to see that he was qualified or not rusty.

Q 95 Was there another operator scheduled to be on the evening shift that evening to your knowledge

A 95 Previous to this it is normal to have an approach controller and a GCA controller on, but on this particular night I am not sure that another controller was scheduled.

Q 96 Immediately after [redacted] informed you that he had lost the aircraft on radar, did you check the equipment for serviceability

A 96 Yes, he came to the standby room and told me that he had lost his aircraft and immediately went to the operation trailer and checked both precision and search radar and found it to be fully serviceable

Q 97 How long have you been a qualified Radar Technician on CPN4

A 97 Approximately two years

Q 98 During this period have you ever been aware of a radar target that disappeared instantaneously off the scope on precision radar

Budgell
(RG Budgell) LAC

EXEMPTION/EXCEPTION 19(1)
ACCESS TO INFORMATION ACT/
LOI SUR L'ACCÈS À L'INFORMATION

A 98 No, I never have

Q 99 On the 1 Wing RCAF GCA have you ever had it brought to your attention by any of the controllers that the side lobe effect or extensions to the target on the precision radar were bothering their control of the aircraft

A 99 Not during my stay here so far, which has been since the 3 Dec 63

Q 100 Have you noticed the side lobe effect on targets at 1 Wing RCAF

A 100 Yes

Q 101 Does the use of STC on the GCA eliminate these side lobes when the target is close in on final

A 101 I really don't because of lack of experience at this unit

RG Budgell
(RG Budgell) LAC

The ninth witness 206672 FS A Stacey having been called and duly sworn states :

I am 206672 FS A Stacey employed as an Air Traffic Control Assistant at 3 Wing RCAF, Zweibrucken, Germany.

I was advised to report to 1 Wing RCAF to give assistance to the Board of Inquiry into the crash of Bristol Aircraft N° 9697, and as requested, I worked the GCA unit at 1 Wing RCAF, with the following observations.

Four GCA precision runs were completed at Marville using Bristol VC 9700 as test aircraft. Normal radar was used at all times and Sensitivity Time Constant was not used.

On the first run it was noticed that the radar return in elevation was abnormally extended. On close inspection the target extended from the aircraft return predominantly upwards a matter of approximately 50% of aircraft return. This could be partially eliminated by means of the gain control. However, judgement of glide path interception is difficult for anyone inexperienced on this particular set. The gain control was adjusted so that the aircraft return was as small as possible and the antennae were servoed on the aircraft at all times. Even under these conditions the target would extend upwards. This gave the appearance of the aircraft return, dancing above and then on the glide path. Again, a controller used to this unit would ignore this upper lobe through experience. A second normal run emphasized the above. It must be stressed that this shift in the position of the aircraft in relation to glide path was not caused by a faulty scope, video, shifting with the sweep, etc. From a technician's standpoint, the radar was good. On the next run descent was started early in order to keep the aircraft at what was judged to be 200 feet below normal glide path. Again this was made difficult by the upper target extension and the difficulty was augumented by the use of a little more gain than before. This made the upper target extension a part of the aircraft return as it was as strong and sometimes stronger than the main aircraft return. The combination of the two made a target about 2 inches long. Even though the aircraft was judged to be 200 feet below the glide path a good part of the combined aircraft return and target extension was above the glide path.

On the last run, gain was increased a little more, though not to maximum. Again descent was started early so as to keep the aircraft 200 feet below the glide path. The combined target and target extension was greater than before with a large portion of it above the glide path. At approximately 2½ miles the combination return lengthened rapidly to at least 2½ inches and appeared to be almost centered on the glide path. Any accurate determination of altitude from this distance in became impossible ~~to~~ at the gain setting used.

On each run the gain control was progressively decreased as the aircraft approached and the antennae servoed on the aircraft. Increase of gain mentioned is relative to preceding run. Radar returns in azimuth were excellent at all times.

About two hours later three GCA runs were observed. The GCA controller was experienced in the use of this equipment and it was noticed that he kept his aircraft return 2/3 of the way above the glide path. He had been asked to keep gain higher than usual. In my judgement the aircraft were on the glide path when total radar return was 2/3 above.

A Stacey

(A Stacey) FS

s.19(1)

CONFIDENTIAL

CONCLUSIONS :

1 Aircraft returns in elevation are abnormal, caused by an extension to the top of the target. If the gain con rol is not adjusted carefully, this target extension becomes a part of the aircraft return and could be considered as such.

2 If the gain control is not progressively decreased as the aircraft approaches, the length of the return increases rapidly and becomes unmanageable in the case of a large target aircraft such as a Bristol. At 1½ miles such an aircraft could be almost on the ground and still have a good portion of the radar return plus target extension above the glide path. It is realized that a controller is taught to use gain control as the aircraft approaches. This equipment requires more critical adjustment than usual.

Q 102 Did the test runs carried out on the 10 Jan 64 produce any significant difference in your opinion than you have already pointed out in your statement?

A 102 The overall performance was less than on the 8 Jan 64.

Q 103 As requested by the Board, you observed [redacted] controlling two runs, could you give us your opinion of the Cpl as a GCA controller and any discrepancies in techniques noted?

A 103 There were three small errors on the traffic pattern. Twice he assumed that he had positive radar contact with a 30° turn. Now he had scarcely any need to do that because he knew where his aircraft was and a 30° turn is not enough to assure positive radar contact. Another time an aircraft had overshot, he said he had the aircraft one mile from the end of the runway, when in effect the aircraft was two miles N after 140° turn to the left. That was all I noticed about the traffic portion. On the final approach gain control was kept fully up and was kept so until glide path interception. This, to my way of thinking is very difficult to judge with full gain with the extremely large target in elevation. At approximately five miles, Cpl Frye switched on the STC. This reduced the gain from six miles in but not sufficiently so as to reduce the aircraft to workable size. From that point in, I noticed no reduction in IF gain. The aircraft continued to come down the glide path with a two inch return. After the aircraft got to 2½ miles, the elevation servo antenna was not used, which it should be, because the aircraft is rapidly going outside the antenna beam. On the second run, the same operating errors, i.e. no reduction in gain at all occurred.

Q 104 What, in your opinion, is the cause of the poor operating techniques that you observed being used by [redacted]

A 104 If [redacted] was working for me, I would insist that he keep the gain control at the minimum to produce a positive well-defined target.

A Stacey

(A Stacey) FS

EXEMPTION/EXCEPTION 19(1)
ACCESS TO INFORMATION ACT/
LOI SUR L'ACCÈS À L'INFORMATION

CONFIDENTIAL

The tenth witness 16644 F/L WJ Carpenter having been called and duly sworn states :

I am 16644 F/L WJ Carpenter, employed as a Chief Controller, RAPCON, 3 Wing RCAF, Zweibrucken, Germany.

I was advised to report to 1 Wing RCAF to give assistance to the Board of Inquiry into the crash of Bristol Aircraft N° 9697. On 8 Jan 64, in company of the Board, I observed GCA approaches at 1 Wing RCAF and made the following comments :

1st Approach - Controller - FS Stacey - Bristol Aircraft

The manipulation of the IF gain and antenna servo control was judged to normal and adequate. The presentation of the aircraft on the azimuth precision indicator was good throughout the approach. Target extension development was not apparent on the azimuth indicator. However, the target extension development on the elevation precision indicator was considered too great for the selected gain level on this and subsequent approaches. The upper target extension was on occasion equal to, or greater than the main aircraft target return in terms of intensity.

2nd Approach - Controller - FS Stacey - Bristol Aircraft

This approach was carried out with the purpose of utilizing minimal IF gain settings through the approach. The results were satisfactory, with the exception that the target on the elevation indicator was observed to be slightly broken and distorted in relation to the azimuth target. With both antennae trained directly on the aircraft, it was noted that the elevation return was weaker than the azimuth return.

3rd Approach - Controller - [redacted] - T33 Aircraft
4th Approach - Controller - [redacted] - T33 Aircraft

Both approaches were carried out with an excessive IF gain setting. As a direct result of this, there were very large elevation returns with large vertical target extensions. The ground return from the tree area at approximately one mile from touchdown obscures the glide path presentation at this IF ~~fa~~ gain setting. In addition, similar ground return from the approach lights obscures the glide path presentation from one half mile to the touchdown point. Since the aircraft target is large in the final portion of the approach, it is virtually impossible to determine the actual position of the aircraft within the target presented, when the target is all or partially obscured by ground returns. Therefore, accurate glide path control cannot be accomplished. Nevertheless, during both of these approaches, the pilot was assured that his aircraft was on the glide path while passing through the obscurations.

5th Approach - Controller - FS Stacey - Bristol Aircraft
6th Approach - Controller - FS Stacey - Bristol Aircraft

These approaches were carried out with the purpose of placing the upper target extension of the elevation target on the glide path, and to thus ascertain the true path of the aircraft in relation to the glide path. The IF gain was high but not at the full extent of its capability. Glide path interception occurred at six and three quarter miles from the touchdown point. Descent was established at five hundred feet per minute, and the aircraft was observed to track well below the actual glide path. At two and one half miles from touchdown, the target had such a vertical extent that, with the upper target extension placed on the glide path, the aircraft was judged to be at an altitude of approximately

(WJ Carpenter) F/L

EXEMPTION/EXCEPTION 19(1)
ACCESS TO INFORMATION ACT/
LOI SUR L'ACCÈS À L'INFORMATION

one hundred and seventy five feet below the glide path. Both approaches were discontinued at approximately one and one half miles from touchdown as the aircraft became dangerously low.

7th Approach - Controller - LAC Marshall - C45 Aircraft

During the two-hour interval between the last approach by FS Stacey and the commencement of this approach, there was a marked decrease in the video presentation level on the precision indicators. This was probably due to a not unusual deterioration in the radar system during these two hours. Still, the presence of a target extension development was apparent at high gain settings. The antennae were deliberately trained away from the aircraft target to determine whether the aircraft target or the target extension faded first. This experiment showed the aircraft target to disappear first, but by only a slight margin in time. This controller was observed to use good operating techniques throughout.

8th Approach - Controller - LAC Marshall - C47 Aircraft

Similar experiments were conducted on this approach to determine the difference between the C45 aircraft and the C47 aircraft. A slight increase in radar target we strength was noted but the video presentation level on the precision indicators was similar to that of the immediately preceding approach with the C45 aircraft. Again, proper operating techniques were used by the controller.

9th Approach - Controller - LAC Marshall - Bristol Aircraft

In the interval between the approach of the C47 aircraft, the video presentation level on the precision indicators was improved. A marked increase in target return was observed with associated increase in target extension, upper and lower. During this approach, as in all preceding approaches, there was a persistent shifting of the elevation target in the vertical plane. At a point approxim tely three miles from touchdown, the IF gain was placed at a high level briefly, with the result that - the actual position of the aircraft within the entire vertical target was seen to be in the lower third of that target. Subsequent to this check, normal control procedures were applied throughout the remainder of the approach.

Q 105 Would you advise the Board of your qualifications as a GCA controller?

A 105 For seven of the nine years since 1954 I have been a qualified GCA controller and at the present time, I am qualified to station limits at 3 Wing. I have controlled approximately 6300 approaches.

Q 106 During the past few days you have observed several 1 Wing GCA controllers in operation. Would you advise the Board of any shortcoming noted, particularly in operating techniques?

A 106 Two out of the four controllers that I have observed used proper operating techniques and conducted their approaches in a safe manner, however, the other two were observed to use improper operating techniques and conducted all of their approaches in a manner which is considered unsafe.

(WJ Carpenter) F/L

CONFIDENTIAL

Q 107 Did the test runs carried out on the 10 Jan 64 produce any significant difference in your opinion than you have already pointed out in your previous statement?

A 107 Yes, there was a difference. The video presentation of the target was considerably lower, i.e. the overall performance of the set was less than on the 8 Jan 64.

Q 108 As requested by the Board, you observed [redacted] controlling two runs, could you give us your opinion of the Cpl as a GCA controller and any discrepancies in techniques noted?

A 108 On the basis of his operating techniques that I have seen I would not consider him acceptable as a GCA controller on this unit. Although he has been trained in the proper use of the associated controls of the precision radar, he did not use them or make any attempt to use them. The approaches to the runway at Marville mandatorily dictate the use of precision controls to execute a safe approach.

Q 109 What, in your opinion, could be the cause of the operating techniques that you observed being used by [redacted]

A 109 The basic cause is apparent dismissal of the operating techniques that he has been trained to use and there appears to be a lack of qualified supervision.

Q 110 In the Air Division, at Wing level, who is directly responsible for the supervision and training of GCA controllers.

A 110 The Chief Controller GCA at each Wing as far as I know, who is always a WO or SR NCO, is responsible for their training and supervision.

Q 111 In the chain of command, to whom is the supervisor responsible for the operational proficiency of the GCA controllers?

A 111 The Chief Controller RAPCON, who is an officer.

Q 112 Is the Chief Controller RAPCON necessarily either qualified in, or familiar with, the GCA operation?

A 112 No.

(WJ Carpenter) F/L

s.19(1)

CONFIDENTIAL

The eleventh witness 27277 F/L WL Ruttle having been called and duly sworn states:

I am 27277 F/L WL Ruttle employed as Air Traffic controller at 1 Wing, RCAF, Marville, France.

Q 113 Are you the Senior Air Traffic Controller at 1 Wing RCAF

A 113 In seniority only, yes

Q 114 Are you the Chief Controller RAPCON

A 114 No, on the 5th January 1964 I relinquished that position

Q 115 How long had you been Chief Controller RAPCON

A 115 From approximately May 1963

Q 116 Were you on duty on the night of the 30th December 1963

A 116 No, but I had been scheduled for duty

Q 117 What caused the schedule to be changed

A 117 Lack of traffic to put it very briefly. We anticipated more traffic during the Christmas period and it was found that one controller could handle it all. I reported for duty that evening but because of lack of traffic I was released by SAFCO

Q 118 Would your air traffic and GCA controller strength permit you to operate around the clock on a continuous basis

A 118 Yes

Q 119 Under normal traffic situation how many approach controllers and GCA controllers are on duty on the evening and night shifts

A 119 The answer would be at RAPCON when no scheduled night flying is laid on or we are not being used as a weather alternate by another wing carrying out night flying, we reduce to minimum crew. Minimum crew is one officer and one qualified GCA controller as per Air Traffic Control Orders

Q 120 As Chief Controller RAPCON, who is responsible to you for the operating proficiency of the GCA controllers

A 120 At Marville the term used is Chief Controller GCA, who is a Sr NCO

Q 121 Who is the Sr NCO here

A 121 [redacted]

Q 122 Have you as Chief controller been satisfied with [redacted] management and supervision of the GCA controllers

A 122 His administrative capability has been questionable for some time. I have not had occasion to question his proficiency in checking on GCA operator proficiency

(WL Ruttle) F/L

CONFIDENTIAL

Q 123 Are you yourself or have you ever been a qualified GCA controller

A 123 No

Q 124 Did the Chief Controller GCA ever bring to your attention re the operating proficiency of [redacted]

A 124 Not that I recall

Q 125 At the time that [redacted] was flight checked what assessment did you make of his ability as a GCA controller

A 125 When the check was given it was completed in a very satisfactory manner. Subsequent de-briefing by WIF pilot rated him as I recall as above average potential. It is standard practice for either myself of the SATCO to monitor the flight check and in this case I monitored Cpl Frye

Q 126 Is it standard practice at 1 Wing for the Chief Controller (RAPCON) to receive the ground training assessment (PT2) on GCA controllers transferred to the unit

A 126 I would say not necessarily. As SATCO, you would normally check the files on the newly transferred person to the unit. As Chief Controller RAPCON, I only recall seeing PT2s on personnel that had been here and had taken some type of course and returned.

(WL Ruttle) F/L

CONFIDENTIAL

The twelfth witness: having been called and duly sworn states:

I am Keneth J. O'Brien employed as Gilfillan Corporation field service representative for 1 Air Division.

The following statement covers my technical investigation at the 1 Wing unit since its reported unserviceability.

On 2 Jan 64 I came to 1 Wing to evaluate the technical status of the GCA (or RAPCON) Radar Unit. The unit had been shut down and was awaiting a flight check. Previous to the flight check, I examined the unit concentrating mainly on the precision system because of obvious reasons.

The following things were checked. Siting, Transmitter Frequency and power output, Frequency Spectrum and Voltage standing wave ratio, cursor alignment (I checked the elevation cursor alignment very closely). I then checked the PRF and receiver sensitivity. I checked the primary AC power and all the DC power supplies. The antenna system was checked for correct installation and alignment, both electrical and mechancial. At this point it must be noted that the circular polorization grates were in the "out" position on both antennae. The right hand co secant plates were installed on the elevation antenna. While checking the site the trailer leveling was also checked. On 2 Jan I checked the maintenance log book and nothing was done that could have changed the accuracy of the precision system. It was my opinion at that time (and now) that this set is well maintained. In my opinion the 1 Wing GCA unit was aligned and operating correctly previous to the 2 Jan 64 flight check, as far as could be determined by examining the system without seeing any airplanes on the indicator. After watching Sgt Hughes operate a Bristol Aircraft, I thought everything looked normal. At this point I thought the 1 Wing GCA radar was in very good condition.

On 9 Jan 64 I was called back to 1 Wing to have another look at the radar. The last thing I did at 2 Wing before coming to 1 Wing was observe a Bristol GCA approach. The targets I saw at 1 Wing that very same day were definately abnormal. The targets on the Elevation Indicator were much larger than normal, by as much as four times in the vertical direction. I must admit that I had never seen such large targets before. It also appeared to me that Sgt Hughes was able to control this target, by using his radar controls, to workable dimensions. Although at times the target seemed to break up a bit. This condition was not consistent. After observing several approaches with different types of aircraft on 9 and 10 Jan I was convinced we had an abnormal condition. On Sat 11 Jan I did several tests with the radar. The left hand plates were installed, the transmitter, receiver, pre canceller and power supplies were changed in the precision system. Each time something was done an approach was observed and none of these things made any change to the radar. On Sunday 12 Jan a different Elevation Antenna was installed. This antenna was flown over from Canada on a UOA supply demand from Canada. Previous to this it had been overhauled by Gilfillan Bros and tested at a special site built for this purpose. It had not been installed in a unit after this overhaul and test; to the best of my knowledge.
The weather was bad on 12 Jan so we were unable to do any flight checking.

Kenneth J. O'Brien

(K.J. O'Brien) Mr

CONFIDENTIAL

On Monday 13 Jan the weather was again bad but a CL-106 (Yukon) did an approach. After this approach I thought that there had been a great improvement but further check revealed that the receiver sensitivity had been low. After this was rectified the ground targets once again took on their former appearance. No further flights were observed but I again gave the whole system a check-out both mechanical and electrical and could find nothing amiss.

Tuesday 14 Jan we again did several checks. This time we rotated the unit from one end of the runway to the other and also we tried two different points other than on a runway that looked clear. In other words we simulated an approach in a clear area. The targets were still larger than normal but everyone agreed they no longer borke up when using gain controls. We did a couple of approaches with an American H-34 helicopter at slow speeds and the target looked reasonable with the gain controlled properly.

Wednesday 15 Jan. F/L Mike Campbell a GCA controller expert was called in to look at the radar. He did several approaches and declared the radar was safe to operate. He liked the radar best of all when the circular polarization was in the "In" position because this definately makes the elevation targets smaller. In fact now with this circular polarization in, I am of the opinion these targets are very close to normal. However, today a demand for a new reflector was submitted and will be installed when it arrives. This reflector along with the antenna make up the pattern that is transmitted and in my opinion could completely repair this set. If the reflector is at fault I have no way that I know of determining when it started.

Kenneth J. O'Brien

(K.J. O'Brien) Mr

 CONFIDENTIAL

The 13th witness having been duly sworn states that I am 13318 S/L G.S. Hogg employed as Officer Commanding of 109 KU Flt 2 Wing Grostenquin. The following are my narrative assessments on the ability and qualifications of F/L Clouthier and F/L Hamlin.

F/L VI Clouthier has been flying the Bristol aircraft since he reported to 137(T) Flt in Langar in Aug 60 and to the best of my knowledge had approximately 1800 hrs on type. I have been impressed with his ability as a pilot from my first association with him in Aug 63. He formerly was a CEPE pilot and has had some engineering background at University. As he was keenly interested in the Bristol a/c, he was appointed as the Unit Bristol project officer and had produced some worthwhile changes regarding cockpit arrangements, etc. When aircraft 9850 was being modified at the contractors and fitted with TACAN and RDRID, F/L Clouthier was instrumental in suggesting the new cockpit layout which was required. In addition, he was also a UICP. This officer was held in the highest regard by his fellow Bristol pilots, both for his flying ability and his technical knowledge of the aircraft. At any time I flew with him, I was impressed with his attention to detail and the intelligent and careful planning that he put into his flights. He was the first to come to me with complaints on inefficiency regarding any aspect of flying; maintenance, servicing, meteorology, Air movements or GCA.

F/L Clouthier was tested by the Air Standardization Unit in Oct-Nov 63, both as a Bristol a/c captain and as a checking officer. His reports in both positions were very good. His green instrument rating was valid until 28 Jun 64.

F/L Hamlen joined 109 Com Flt as a Dakota pilot in Oct 61 and has almost 1500 hrs on that type. Prior to the move of 137(T) Flt from Langar to 2 Wing, this officer expressed an interest in the Bristol a/c and reported to 30 AMB for his initial training on the aircraft on the 28 May 63. Although I never flew with this officer, the training officers were impressed with his ability as a pilot from the outset. Of the three that reported for conversion training at that time, he is the only one who has obtained his captaincy on the aircraft. He received his proficiency and captain's check from the Bristol pilot leader on SF 85/86 on the 13 to 16 of Nov inclusive. At that time, he had close to 250 hrs on type. Both the Dakota and Bristol pilot leaders speak highly of his pilot ability, noting particularly that he was always careful and meticulous in all details of pre-flight preparation and flying.

This officer was not rated by the Air Standardization Unit. His green instrument rating was valid until 5 Mar 64.

G.S. Hogg

(G.S. Hogg) S/L

CONFIDENTIAL

Q./27 Who authorized the flight of Bristol 9697 on 30 Dec 63 from Grostenquin - Marville - Gatwick and return?

A./27 This was a regular Schedule flight initialy authorized by 1 Air Division Headquarters. An ops order for such flight is prepared by the Unit Despatcher outlining all pertinent details for the Captain who subsequently authorizes the flight himself on the F17 prior to departure and in this case was F/L Hamlin. This is in accordance with 109 KU Flying Order #16.

Q./28 Is there a standard Cockpit procedure in 109 KU whereby the pilot of the aircraft is warned that he has reached minimum approach altitude?

A./28 No, there is not, however the pilot flying the aircraft should have studied his letdown chart prior to descent and should be thoroughly familiar with the minimum altitude to which he is authorized to descend to. In addition it is the practice within the flight for the first officer or second pilot to place his left hand firmly on the shoulder of the pilot flying the aircraft as soon as the airfield or the lead in lights are seen.

Q./29 Is it standard practice in 109 KU for the pilot to note the altimeter error prior to take-off?

A./29 This is a question which has been discussed among the Bristol pilots for sometimes and to the best of my knowledge most Bristol pilots are in the habit of obtaining the forecast altimeter setting for destination prior to departure so that it is available in the event of radio failure. It is also standard practice prior to obtaining taxi for the pilot to obtain the QNH from the tower. This is set on the subscale of the altimeter if the altimeter is then out more than .05 millibars or 50 feet the altimeter is unserviceable and in any event the error is noted.

Q./30 Have you any other information you would like to contribute that might assist the board in the inquiry?

A./30 No

G.S. Hogg

(G.S. Hogg) S/L

CONFIDENTIAL

STATEMENT BY THE MEDICAL MEMBER

I am 244784 F/L A Savoie, Medical Member of the Board of Inquiry.

I have examined all relevant medical documents concerning F/L V Clouthier and F/L JK Hamlen (pilots of the crashed aircraft) and the following information has been extracted :

(a) Annual Aircrew Examinations :

F/L Clouthier, 9 December 1963
F/L Hamlen , 3 September 1963

(b) Last entry in ISM 16 :

F/L Clouthier, 18 December 1963 (sore throat)
F/L Hamlen , 12 December 1963 (sinnsites) nil.

(c) Neither suffered from any chronic health condition that could suddenly have constituted a hazard in flight.

(d) The persons acquainted with the two officers and who were interviewed at 2 Wing RCAF, Grostenquin, acknowledged that the two officers were acting quite normally during the immediate period prior to the accident and that they had passed a quiet evening at home.

(e) It is therefore concluded that :

(i) both officers ere in good mental and physical health at the time of their last flight;

(ii) that no aeromedical factor was involved in the accident prior to departure.

Since the results of the autopsy on F/L Clouthier (pilot) did not produce any significant factors, the autopsy report has not been included in these proceedings and was sent under separate cover to the Surgeon General. An autopsy on F/L Hamlen was not performed because the body was badly burned and charred.

I have examined all the bodies of the persons mentioned on the death certificates, to a total of eight, and agree that they have obviously died from the injuries listed.

I have also examined the survivors, to a total of three, and found them to be as described on the adjoining R78A.

André Savoie F/L

(JAOA Savoie) F/L

Exhibit IV to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

DEATH CERTIFICATE - F/L CLOUTIER

CONFIDENTIAL

D E A T H C E R T I F I C A T E

The Undersigned Medical Officer

NAME ....[illegible]....

RANK....[illegible]....

QUALITY..[illegible]....

ADDRESS..1 Wing RCAF....

Certifies That:

NAME .....[illegible]....

CHRISTIAN NAMES ..[illegible]....

RANK OR DUTIES....Pilot Lieutenant....

MATRICULE.....[illegible]....

BORN ON.....[illegible]....

AT.....[illegible]....

SON OF.....[illegible] (Father)....

AND OF.....

(1)
Husband/Wife
(Strike Off Unapplicable)

SON OF..... NAME .....

DAUGHTER OF..... RANK OR DUTIES .....

ADDRESS...1 Wing RCAF.....

DIED ON....20 December 1963..... TIME ...2156.....

AT.....1 Wing RCAF.....

CAUSES OF THE DEATH.....Head Injuries and Fractured Legs.....

Signature of Medical Officer

CERTIFIED TRUE COPY

(Stamp) JAS

(H CARRIGAN) S/L

(1) For dependents

CERTIFIED TRUE COPY

President

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Exhibit V to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

DEATH CERTIFICATE - F/L HAMLIN

CONFIDENTIAL

D E A T H C E R T I F I C A T E

The Undersigned Medical Officer

NAME ..... [illegible] .....

RANK ..... Squadron Leader .....

QUALITY ..... Medical officer .....

ADDRESS ..... 1 Wing RCAF .....

Certifies That:

NAME ..... HAMLIN .....

CHRISTIAN NAMES ..... John Kenneth .....

RANK OR DUTIES ..... Flight Lieutenant .....

MATRICULE ..... 23004 .....

BORN ON ..... 16 Sep 1931 .....

AT ..... Toronto, Ontario .....

SON OF ..... Mr. M.B. Hamlin (Father) .....

AND OF .....

(1)
Husband/Wife
(Strike Off Unapplicable)

SON OF ..... NAME .....

DAUGHTER OF ..... RANK OR DUTIES .....

ADDRESS ..... 2 Wing RCAF .....

DIED ON ..... 30 Dec 63 ..... TIME ..... 0156 .....

AT ..... 1 Wing RCAF .....

CAUSES OF THE DEATH ..... Severe Burns .....

Signature of Medical Officer

[illegible] Squadron) S/L

CERTIFIED TRUE COPY

(Stamp)

(1) For dependents

President

CONFIDENTIAL

Exhibit VI to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

DEATH CERTIFICATE - F/L WALSHE

D E A T H C E R T I F I C A T E

The Undersigned Medical Officer

NAME ..... N Carriere .....

RANK ..... Squadron Leader .....

QUALITY ..... Medical Officer .....

ADDRESS ..... 1 Wing RCAF .....

Certifies That:

NAME ..... WALSHE JAS .....

CHRISTIAN NAMES ..... ~~David~~ EDWARD John .....

RANK OR DUTIES ..... Flight Lieutenant .....

MATRICULE ..... 130045 .....

BORN ON ..... 4 October 1929 .....

AT ..... MacLeod Alberta .....

SON OF ..... Mr. R.F. Walshe (Father) .....

AND OF .....

(1)
Husband/Wife
(Strike Off Unapplicable)

SON OF ..... NAME .....

DAUGHTER OF ..... RANK OR DUTIES .....

ADDRESS ..... 2 Wing RCAF .....

DIED ON ..... 30 December 1963 ..... TIME ..... 2156 .....

AT ..... 1 Wing RCAF .....

CAUSES OF THE DEATH ..... Severe Burns .....

Signature of Medical Officer

(N Carriere) S/L

CERTIFIED TRUE COPY

(Stamp) JAS

(1) For dependents

CERTIFIED TRUE COPY

President

CONFIDENTIAL

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Exhibit VII to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

D E A T H C E R T I F I C A T E

The Undersigned Medical Officer

NAME ..... N Carriere

RANK ..... Squadron Leader

QUALITY ..... Medical Officer

ADDRESS ..... 1 Wing RCAF

Certifies That:

NAME ..... JOHNSTON

CHRISTIAN NAMES ..... Britton Lyall

RANK OR DUTIES ..... F/L

MATRICULE 30440

BORN ON ..... 5 Jan 25

AT ..... Lennoxville P.Q.

SON OF ..... Willard N. Johnston

AND OF ..... Ruby Johnston

(1)
Husband/Wife
(Strike Off Unapplicable)

SON OF ..... NAME .....

DAUGHTER OF ..... RANK OR DUTIES .....

ADDRESS ..... 1 Wing RCAF .....

DIED ON ..... 30 Dec 63 ..... TIME ..... 2156 .....

AT ..... 1 Wing RCAF .....

CAUSES OF THE DEATH ..... Head Injuries .....

Signature of Medical Officer

(N Carriere) S/L

CERTIFIED TRUE COPY

(Stamp) JCS

(1) For dependents

President

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Exhibit VIII to
Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

DEATH CERTIFICATE - SGT BACH

CONFIDENTIAL

DEATH CERTIFICATE

The Undersigned Medical Officer

NAME .... N Carriere

RANK..... Squadron Leader

QUALITY.. Medical Officer

ADDRESS.. 1 Wing RCAF

Certifies That:

NAME .... BACH

CHRISTIAN NAMES ... Peter Anton George

RANK OR DUTIES.... Sergeant

MATRICULE..... 26307

BORN ON..... 13 May 1922

AT..... Winnipeg, Manitoba

SON OF..... Not Known

AND OF..... Not Known

(1)
Husband/Wife
(Strike Off Unapplicable)

SON OF..... NAME .....

DAUGHTER OF..... RANK OR DUTIES .....

ADDRESS 30 AMB Langar

DIED ON.... 30 December 1963 TIME 2156

AT 1 Wing RCAF

CAUSES OF THE DEATH Head Injuries

Signature of Medical Officer

CERTIFIED TRUE COPY

(N Carriere) S/L

(Stamp)

(1) For dependents

President

44

CONFIDENTIAL

Exhibit to the Board of Inquiry Convened at 1 Wing RCAF Marville, France on 31 Dec 63

[illegible] CERTIFICATE - SEE BACK

DEATH CERTIFICATE

The Undersigned Medical Officer

NAME N Carriere

RANK Squadron Leader

QUALITY Medical Officer

ADDRESS 1 Wing RCAF

Certifies That:

NAME BACH

CHRISTIAN NAMES Hazel Mary

RANK OR DUTIES Housewife

MATRICULE

BORN ON 7 December 1926

AT Topcliffe York Co, England

Daughter ~~SON~~ OF George Henry Reed

AND OF Iris Reed

(1) Husband/~~Wife~~ (Strike Off Unapplicable)

Wife ~~SON~~ OF 26307 NAME BACH F.A.G.

DAUGHTER OF RANK OR DUTIES Sergeant

ADDRESS 30 AMS Langar

DIED ON 30 December 1963 TIME 2156

AT 1 Wing RCAF

CAUSES OF THE DEATH Head Injuries & Fractured Legs

Signature of Medical Officer

(N Carriere) S/L

CERTIFIED TRUE COPY

(Stamp)

(1) For dependents

CERTIFIED TRUE COPY

000692

45

Exhibit X to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

DEATH CERTIFICATE - MASTER BACH

CONFIDENTIAL

DEATH CERTIFICATE

The Undersigned Medical Officer

NAME N Carriere

RANK Squadron Leader

QUALITY Medical Officer

ADDRESS 1 Wing RCAF

Certifies That:

NAME BACH

CHRISTIAN NAMES Donald George

RANK OR DUTIES

MATRICULE

BORN ON 23 September 1957

AT Winnipeg, Manitoba

SON OF

AND OF

(1)
Husband/~~Wife~~
(Strike Off Unapplicable)

SON OF 26307 NAME BACH P.A.G.

DAUGHTER OF RANK OR DUTIES Sergeant

ADDRESS 30 AMB Langar

DIED ON 30 December 1963 TIME 2156

AT 1 Wing RCAF

CAUSES OF THE DEATH Head Injuries

Signature of Medical Officer

(N Carriere) S/L

CERTIFIED TRUE COPY

(Stamp) JAS

(1) For dependents

CERTIFIED TRUE COPY

President

CONFIDENTIAL

Exhibit XI to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
31 Dec 63

DEATH CERTIFICATE - MRS MIDDLEMISS

D E A T H C E R T I F I C A T E

The Undersigned Medical Officer

NAME ..... M. Carney .....

RANK ..... Squadron Leader .....

QUALITY ..... Medical Officer .....

ADDRESS ..... 1 Wing RCAF .....

Certifies That:

NAME ..... Middlemiss .....

CHRISTIAN NAMES ..... Hazel Leonora .....

RANK OR DUTIES ..... Housewife .....

MATRICULE .....

BORN ON ..... 21 October 1921 .....

AT ..... Montreal P.Q. .....

Daughter
SON OF ..... Mr. A.E. Mrs. Johns .....

AND OF .....

(1)
Husband/Wife
(Strike Off Unapplicable)

Wife
SON OF ..... NAME Middlemiss D .....

DAUGHTER OF ..... RANK OR DUTIES W/C .....

ADDRESS: 1 Wing RCAF .....

DIED ON ..... 30 December 1963 ..... TIME 2300 .....

AT ..... 1 Wing RCAF .....

CAUSES OF THE DEATH ..... Head Injuries .....

Signature of Medical Officer

M. Carney

(M Carney) S/L

CERTIFIED TRUE

(Stamp)

Department
National Defence
CANADA
MEDICAL SERVICES

(1) For dependents

CERTIFIED TRUE COPY

President

Exhibit XII to the Board of Inquiry Convened at 1 Wing RCAF Marville, France on 31 Dec 63

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

CANADA

47

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

CONFIDENTIAL

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

Certified True Copy: (J Savage) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
CLOUTHIER	VERNER ISADORE	30752

RANK	AGE	TRADE	UNIT
F/L	12 Nov 24		2 Wing

30 Dec 63 2156 Hours
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Head Injuries and fractured legs

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

(Signed)
(M Carriere) S/L

2 Jan 64
DATE

1 Wing
UNIT

SIGNATURE OF MEDICAL OFFICER

C000695

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER.....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY? √

	(i)		(ii)		(iii)
BOARD OF INQUIRY		COMMANDING OFFICERS INVESTIGATION		UNDERWRITERS ADJUSTMENT BUREAU	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit XIII to the Board of Inquiry Convened at 1 Wing RCAF Marville France on 31 Dec 63

CANADA

48

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

CONFIDENTIAL

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

Certified True Copy (J Savage) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
HAMLIN	JOHN KENNETH	2330074

RANK	AGE	TRADE	UNIT
F/L	18 Sep 34		2 Wing

30 Dec 63 2156 Hours
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Severe Burns

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

2 Jan 64
DATE

1 Wing
UNIT

(Signed)
(M Carriere) S/L
SIGNATURE OF MEDICAL OFFICER

000697

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER.....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY?	√		(i)		(ii)		(iii)
		BOARD OF INQUIRY		COMMANDING OFFICERS INVESTIGATION		UNDERWRITERS ADJUSTMENT BUREAU	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit XLV to the Board of Inquiry Convened at 1 Wing RCAF Marville France on 31 Dec 63

CANADA

CNS 2557 (Rev. 1/59)
CABB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

CONFIDENTIAL

49

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

Certified True Copy: (J SAVAGE) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
WALSHE	EDWARD JOHN	130045

RANK	AGE	TRADE	UNIT
F/L	4 Oct 29		2 Wing

30 Dec 63 2156 Hrs
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Severe Burns

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

2 Jan 64 — DATE
1 Wing — UNIT
(M CARRIERE) S/L — SIGNATURE OF MEDICAL OFFICER

C000699

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY? √

	(i)		(ii)		(iii)
BOARD OF INQUIRY		COMMANDING OFFICERS INVESTIGATION		UNDERWRITERS ADJUSTMENT BUREAU	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b) (i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit XV to the Board of Inquiry Convened at 1 Wing RCAF Marville France on 31 Dec 63

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

CONFIDENTIAL

CANADA

50

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

Certified True Copy [illegible] S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1 JOHNSTON [illegible] LYALL 30445

SURNAME GIVEN NAMES NUMBER

RANK	AGE	TRADE	UNIT
F/L	5 Jun 27	[illegible]	1 Wing

30 Dec 63 2100 Hrs
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE DATE SIGNATURE OF INJURED PERSON DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Head Injuries

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

(Signed)

2 Jan 64 — DATE

1 Wing — UNIT

[illegible] O/C — SIGNATURE OF MEDICAL OFFICER

000701

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? Yes

(ii) NATURE OF DUTY:

Flying

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? N/A

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER N/A

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? N/A

(Vi) WAS ANY ONE TO BLAME? Not known

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? Yes IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY?	√	BOARD OF INQUIRY (i)		COMMANDING OFFICERS INVESTIGATION (ii)		UNDERWRITERS ADJUSTMENT BUREAU (iii)	
			Yes				

6 Jan 64	1 Wing, Marville	(Signed) (J Savage) S/L for COMMANDING OFFICER
DATE	UNIT	

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit XV1 to the Board of Inquiry Convened at 1 Wing RCAF Marville France on 31 Dec 63

CANADA

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DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

CONFIDENTIAL

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

CERTIFIED TRUE COPY (J SAVAGE) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
BACH	PETER ANTON GEORGE	26307

RANK	AGE	TRADE	UNIT
SGT	13 May 22		30 AMB

30 Dec 63 2156 hours — DATE AND TIME OF ACCIDENT

1 Wing — PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Head Injuries

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

2 Jan 64 — DATE

1 Wing — UNIT

SIGNATURE OF MEDICAL OFFICER

000703

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY? √ BOARD OF INQUIRY (i) [ ] COMMANDING OFFICERS INVESTIGATION (ii) [ ] UNDERWRITERS ADJUSTMENT BUREAU (iii) [ ]

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b) (i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

CANADA

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

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REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

CONFIDENTIAL

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

Certified True Copy: (J Savage) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
BACH	HAZEL MARY	

RANK	AGE	TRADE	UNIT
MRS	7 Dec 26	Housewife	30 AMB

30 Dec 63 2156 Hrs
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Head Injuries and Fractured Legs

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

2 Jan 64 — DATE
1 Wing — UNIT
(Signed) (M Carriere) S/L — SIGNATURE OF MEDICAL OFFICER

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY?	√		(i)		(ii)		(iii)
		BOARD OF INQUIRY		COMMANDING OFFICERS INVESTIGATION		UNDERWRITERS ADJUSTMENT BUREAU	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit XVIII to the Board of Inquiry Convened at 1 Wing RCAF Marville, France on 31

CANADA

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

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REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

CERTIFIED TRUE COPY (J SAVAGE) S/L

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
BACH	DONALD GEORGE	

RANK	AGE	TRADE	UNIT
	23 Sep 57		30 AMB

30 Dec 63 2156 hours
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE — DATE — SIGNATURE OF INJURED PERSON — DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Head Injuries

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

2 Jan 64
DATE

1 Wing
UNIT

SIGNATURE OF MEDICAL OFFICER

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY?	√	BOARD OF INQUIRY (i)		COMMANDING OFFICERS INVESTIGATION (ii)		UNDERWRITERS ADJUSTMENT BUREAU (iii)	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit XIX to the Board of Inquiry Convened at 1 Wing RCAF Marville, France on 31 Dec 63

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CANADA

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF/R-78A (Rev. 1/59)
7530-21-562-1920

CONFIDENTIAL

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

Certified True Copy: (J SAVAGE) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
MIDDLEMISS	HAZEL LEONORA	

RANK	AGE	TRADE	UNIT
MRS	21 Oct 21	Housewife	3 Wing

30 Dec 63 2156 hours — DATE AND TIME OF ACCIDENT

1 Wing — PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Aircraft Accident Fatality

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

Head Injuries

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" N/A

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? N/A

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? N/A
(NAME OF HOSPITAL)

DATE	UNIT	SIGNATURE OF MEDICAL OFFICER
2 Jan 64	1 Wing	(M Carriere) S/L

000709

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY? √ BOARD OF INQUIRY (i) ☐ COMMANDING OFFICERS INVESTIGATION (ii) ☐ UNDERWRITERS ADJUSTMENT BUREAU (iii) ☐

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit XX to the Board of Inquiry Convened at 1 Wing RCAF Marville France on 31 Dec 63

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CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

CONFIDENTIAL

CANADA

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

CERTIFIED TRUE COPY (J SAVAGE) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
MIDDLEMISS	ROBERT	20037

RANK	AGE	TRADE	UNIT
W/C			3 Wing

30 Dec 63 2156 hours
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Injured in Aircraft Accident
Unable to relate circumstances or to sign name

F.B. Smith Cpl

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

3

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

1 Exposure and shock

2 Comminuted fracture L. ankle

3 IDK (R. knee)

4 Deep laceration scalp

5 Multiple contusions and abrasions

6 Impaired circulation L. foot

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" Yes

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? 2¼ hours

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? 1 Wing hospital
(NAME OF HOSPITAL)

2 Jan 64 | 1 Wing | SIGNATURE OF MEDICAL OFFICER

DATE | UNIT

000711

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY? √

	(i)		(ii)		(iii)
BOARD OF INQUIRY		COMMANDING OFFICERS INVESTIGATION		UNDERWRITERS ADJUSTMENT BUREAU	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

Exhibit A1 to the Board of Inquiry Convened at 1 Wing RCAF Marville France on 31 Dec 63

s.19(1)

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CANADA

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

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CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

CERTIFIED TRUE COPY (J SAVAGE) S/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

SURNAME	GIVEN NAMES	NUMBER
MIDDLEMISS	DALE	

RANK	AGE	TRADE	UNIT
Miss	[redacted]	Student	3 Wing

30 Dec 63 2156 hours
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

INJURED PERSON'S STATEMENT

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Injured in aircraft accident
Unable to relate circumstances or to sign name

F.B. Smith Cpl

WITNESS TO SIGNATURE | DATE | SIGNATURE OF INJURED PERSON | DATE

MEDICAL OFFICER'S STATEMENT

(a) DESCRIPTION OF INJURIES (IN DETAIL)

1 Shock and exposure

2 Multiple bruises and superficial lacerations

3 Deep lacerations forehead

4 Possible internal (abdominal) injuries

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" Yes

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? 2½ hours

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? 1 Wing Hospital
(NAME OF HOSPITAL)

2 Jan 64
DATE

1 Wing
UNIT

SIGNATURE OF MEDICAL OFFICER

EXEMPTION/EXCEPTION 19(1)
ACCESS TO INFORMATION ACT/
LOI SUR L'ACCÈS À L'INFORMATION

000713

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY?	√	BOARD OF INQUIRY (i)		COMMANDING OFFICERS INVESTIGATION (ii)		UNDERWRITERS ADJUSTMENT BUREAU (iii)	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b) (i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

CONFIDENTIAL

CANADA

57

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN FORCES

REPORT ON INJURIES OR IMMEDIATE DEATH THEREFROM

CNS 2557 (Rev. 1/59)
CAFB 371 (Rev. 1/59)
RCAF R 78A (Rev. 1/59)
7530-21-562-1920

CERTIFIED TRUE COPY (J SAUVE) C/L

TO BE COMPLETED IN ACCORDANCE WITH (GO 24-01/5 RCN), (CAO 63-5 ARMY), (AFAO 24-01/02 RCAF)

1

SURNAME	GIVEN NAMES	NUMBER
COUGLE	B	207746

RANK	AGE	TRADE	UNIT
LAC		AFTech	2 Wing

30 Dec 63 2156 hours
DATE AND TIME OF ACCIDENT

1 Wing
PLACE OF ACCIDENT

2 **INJURED PERSON'S STATEMENT**

(WHEN PRACTICABLE)

I HEREBY DECLARE THAT THE FOLLOWING IS A TRUE STATEMENT OF HOW THE INJURIES WERE SUSTAINED BY ME:

Injured in aircraft accident
Unable to relate circumstances or to sign name

B.B. Smith Cpl

WITNESS TO SIGNATURE — DATE — SIGNATURE OF INJURED PERSON — DATE

3 **MEDICAL OFFICER'S STATEMENT**

(a) DESCRIPTION OF INJURIES (IN DETAIL)

1 Shock and exposure
2 Fracture L. femur
3 Multiple contusions and abrasions

(b) ARE THE INJURIES LIKELY TO CAUSE A PERMANENT DISABILITY? STATE "YES" OR "NO" Yes

(c) HOW LONG BEFORE INITIAL TREATMENT WAS GIVEN? 2½ hours

(d) ADMITTED TO HOSPITAL OR SICK IN QUARTERS? 1 Wing Hospital
(NAME OF HOSPITAL)

2 Jan 64
DATE

1 Wing
UNIT

SIGNATURE OF MEDICAL OFFICER

000715

COMMANDING OFFICER'S STATEMENT

4

(a) WAS THE INJURY SUSTAINED:

(i) IN THE PERFORMANCE OF MILITARY DUTY? .....

(ii) NATURE OF DUTY:

(iii) WAS IT INCURRED IN A GAME OR OTHER FORM OF PHYSICAL RECREATION ORGANIZED BY OR IN ACCORDANCE WITH ANY SERVICE ORDERS OR INSTRUCTIONS? .....

(iV) IF ANSWER TO (iii) IS "YES", IDENTIFY ORDER .....

(V) IF IT WAS INCURRED ON LEAVE, WAS SUCH LEAVE WITH OR WITHOUT PAY? .....

(Vi) WAS ANY ONE TO BLAME? .....

(Vii) WERE THERE ANY WITNESSES TO THE ACCIDENT? ..... IF "YES" THEIR STATEMENTS INCLUDING NAMES AND PARTICULARS SHALL BE ATTACHED.

(Viii) ANY FURTHER REMARKS HAVING A BEARING ON THE ACCIDENT.

(b) IS THE ACCIDENT BEING INVESTIGATED BY?	√	BOARD OF INQUIRY (i)		COMMANDING OFFICERS INVESTIGATION (ii)		UNDERWRITERS ADJUSTMENT BUREAU (iii)	

DATE _____ UNIT _____ COMMANDING OFFICER _____

NDHQ STATEMENT

PROCEEDINGS MENTIONED IN PARA 4 (b)(i) OR (ii) ABOVE ARE FILED ON NDHQ FILE NUMBER .....

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TECHNICAL MEMBERS STATEMENT

The technical member of the Board arrived at the scene of the crash at 0650Z 31 Dec 63, which was approximately one and one half miles from touchdown on the approach to runway 12 at 1 Wing RCAF. The crash truck from 1 Wing RCAF was still at the scene, in addition to guards ensuring that the crash area would not be disturbed. Investigation into the course and path that the aircraft had taken was immediately undertaken. (Reference Wreckage Schematic at Appendices B & C) The aircraft first made contact with a ground obstacle in the form of tree tops. The tops of the trees in the area are about 140 feet above runway level at approximately 1½ miles from the runway. The aircraft travelled some 305 yards from first contact to its final resting place in a dense wooded area. By tracing broken branches and tree tops, it was determined that the aircraft was flying a heading of 123°. The runway at Marville being used for this landing being 120°. After the initial contact and 45 yards distant, another tree top was struck, at the base of which was found a 3" portion from the tip of the starboard propellor. Between Figure 2 and Figure 11 (Appendix B), were found parts of the structure from the port undercarriage, antenna mast with five feet of antenna attached. Since several trees of the same approximate height along the flight path showed no signs of impact, it indicated that the aircraft gained some altitude for a short distance. Sixty yards further along the flight path, contact was made with a large tree (Item 17 Appendix B). Fifteen yards forward and 25 yards to the left of the flight path the port horizontal stablizer complete with port elevator was found standing against a tree with the inboard end on the ground. (Item 21 Appendix B) Examination of the port horizontal stabilizer showed that the leading edge had suffered heavy impact, such as would be administered by contact with a heavy tree branch. Further along and to the right of the flight path parts from the aircraft undercarriage in the form of a strut, fairing strips, etc., were found. Another fifty yards along the flight path and some 195 yards after initial contact, another tree top was struck (Item 24, Appendix "B"), but examination around the area of the tree revealed no parts of the aircraft. After striking this tree (Item 24, Appendix "B") and 45 yards further along the path of flight, the aircraft changed course to 150 degrees striking two large trees and breaking them off approximately 35 feet above the ground (Items 27 and 28 Appendix B). Five yards in front of these trees the leading edge part of the starboard wing tip with the pressure head for the automatic course pitch was found. Ten yards past the tree and to form the left of the flight path the rear part of the starboard wing tip measuring approximately four feet in length was located. Fifteen yards further on was a four foot portion of the outer starboard wing. Ten yards to the left and forward of the wing section was the starboard oleo leg and wheel complete. After striking the two trees (Items 27 & 28 of Appendix B) and 35 yards along the flight path, a large hole approximately 2 feet deep and three feet in diameter was made by the stubbed part of the starboard wing. (Item 34, Appendix B). This was the first actual contact the aircraft made with the ground. Examination of the starboard wing showed ragged tearing and evidence of earth, confirming that the above mentioned hole was made by the starboard wing. At the time of contact with the ground, it appeared that the aircraft was in a bank of about 90°. From this position the aircraft cartwheeled onto the nose doors and port propellor, which buried one blade completely in the ground, snapping off the

(GJ McDowell) F/O
Technical Member

spinner and propellor. At this time it was apparent that a tree 30 inches in diameter at the base was struck. The fuselage and cockpit area broke up. The forward part of the floor, 19 feet, with cargo attached, landed with the underside up. Fourteen feet of the rear floor broke away and turning 90°, landed in an upside down position. The mainplane followed, coming to rest with the port wing between two trees and on top of the forward fuselage area. (Appendix C). The aircraft had turned almost 180° to its direction of flight. (Appendix "C").

The starboard engine, complete with propellor broke off. The port engine broke away and burnt. On finding the aircraft, 2 hours 50 minutes after the crash, the searchers reported that the engine was glowing red, but no actual fire burning.

The empennage came to rest with the starboard stabilizer, complete with elevator, standing vertical and the vertical stabilizer, complete with rudder, turned 90° to the left of its normal position in relation to the aircraft.

The damage to the fuselage and cargo section was primarily caused from contact with the tree that was uprooted and remained in the main wreckage. The force from contact with the tree apparently broke the fuselage open, snapping the floor into two pieces of 19 feet and 14 feet lengths respectively. This caused the passengers and crewman, who were seated in the after part of the aircraft, to be thrown out to the area behind the aircraft.

MAINTENANCE RECORDS

The Maintenance Records for this aircraft were scrutinized and found to be basically correct. Flying time records commence on 9 Nov 54 with 1780 hours brought forward, all special inspections and modifications had been recorded up to date. However, in some cases on the L14/1B change of serviceability and repair log entries regarding the use of the travelling copy of the L14 have not been signed for in the Certified Serviceable column by an authorized officer or NCO as per EO 00-15-1 para 16, page 6 dated 9 Oct 62 and revised 16 Aug 63. Entries regarding above have on occasion been signed by a Cpl or LAC only and not certified as per the above mentioned EO.

FLUID, OIL & DE-ICING FLUID STATE

From perusal of the L14/1 Daily Maintenance form (Travelling copy) it was determined that the aircraft used only two gallons per engine during approximately three hours flight from 2 Wing RCAF to Gatwick. Oil state on departing Gatwich shows the oil state as 22 gallons per engine.

From dipping the fuel tanks it was determined that the aircraft had at least 215 gallons of fuel remaining. The inner port main tank (350 gallon capacity) had broken open and was therefore empty. Fuel state on departing Gatwick indicates 680 gallons of fuel at the beginning of the flight.

The Daily Maintenance form showed that each de-icer tank had 35 gallons for a total of 70 gallons. Each pump separately will produce a flow rate of 14.5 gallons per hour. The maximum flow rate to the propellor de-icing system is 5.25 gallons per hour. With the aircraft being airborne for approximately two hours, the de-icing

(GJ McDowell) F/O
Technical Member

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system even if operating at maximum flow rates, would still have not used more than the 70 gallons carried.

The following exhibits are introduced, Exhibits XXIII covering photos of the crash scene and Exhibit XXIV with photostatic copies of the Maintenance Records.

(GJ McDowell) F/O
Technical Member

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Exhibit XXIII
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

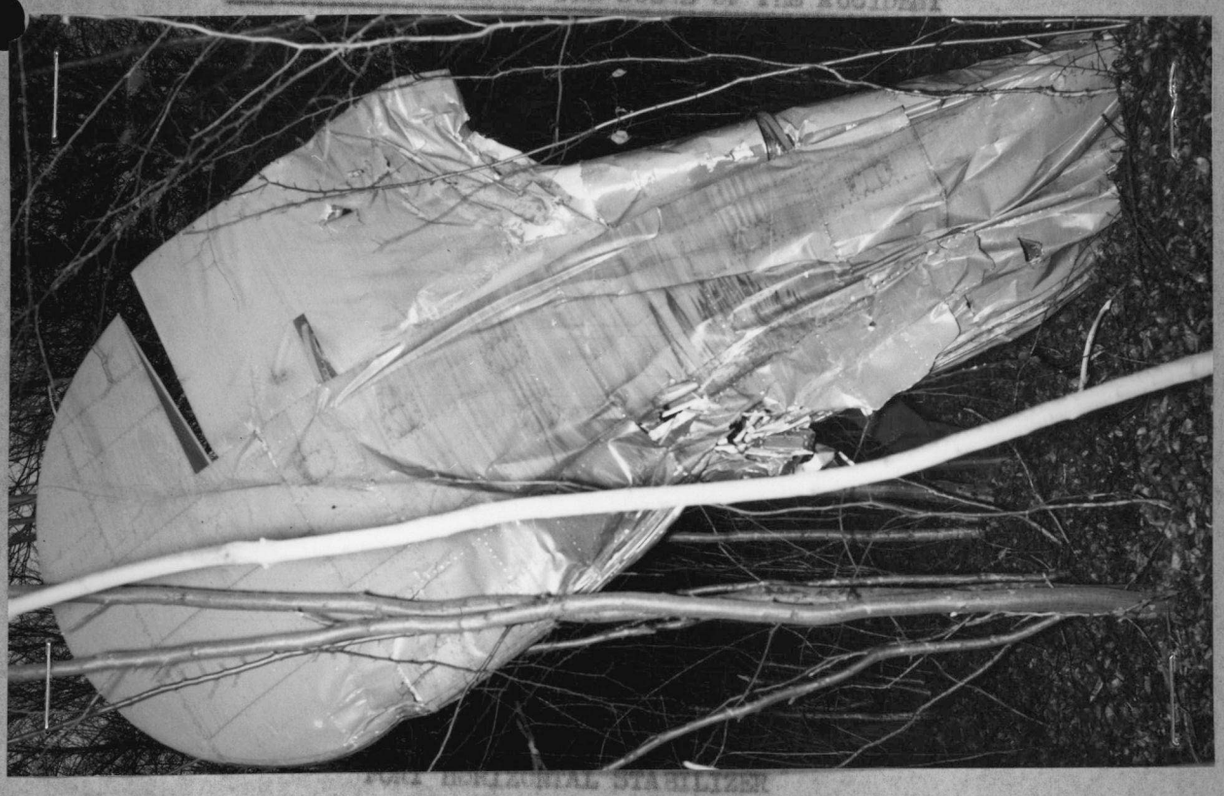
CRASH PHOTOS

T POSITION "2" ON WRECKAGE PLOT (FROM INITIAL IMPACT)

VIEW OF TREES FROM FINAL POSITION OF WRECKAGE

Exhibit XXIII
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

PHOTOGRAPHS TAKEN AT THE SCENE OF THE ACCIDENT



TOP HORIZONTAL STABILIZER

VIEW OF COMPLETE WRECKAGE

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Exhibit XXIII
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

CRASH PHOTOS

STBD ENGINE AND PROPELLER

PORT ENGINE

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64 Exhibit XXIII
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

CRASH PHOTOS

VIEW OF WRECKAGE LOOKING AFT

TAIL SECTION OF AIRCRAFT LOOKING FORWARD

64

RCAF L14/1 (Rev. 11-62)
7530-21-502-6004

DAILY MAINTENANCE FORM

A/C Type: BRISTOL 170 | Reg. No.: 9697 | Date: 30 Dec 63 | Ser. No.:

Sect. 1 — SERVICING—FUEL CERTIFICATE

Tank Loc.

Added	Total	Added	Total	Added	Total	Added	Total	Added	Total	Added	Total	Added	Total	Added	Total
/	100	/	135	/	160	/	160	/	135	/	100				
/	75	/	165	/	165	/	165	/	165	/	70				
55	100	55	135	35	105	25	105	45	135	45	100				

FUEL CERTIFICATE

A/C Total	Checked Time	Checked Date	Signature
780	1120	29 Dec 63	BAYERS
655	1515	30 Dec 63	Bingle
680	1415	30 Dec 63	Bingle

Sect. 1A — OIL STATE

Tank Loc.

1 Added	1 Total	2 Added	2 Total	3 Added	3 Total	4 Added	4 Total	Time	Signature
/	21	/	21					1120	BAYERS
/	21	/	21					1515	Bingle
3	22	3	22					1405	Bingle

COOLANT/WATER INJECTION

1	2	3	4	Signature
Pts. Added				
/ 25	/ 35			DYER
/ 35	/ 35			Bingle
/ 35	/ 35			Bingle

ANTI/DE-ICER FLUID

Pts. Ad.	Signature
/	DYER
/	Bingle
/	Bingle

HYDRAULIC FLUID

Pts. Ad.	Signature
/	DYER
/	Bingle
/	Bingle

OXYGEN

State	Time Date	Signature

Sect. 2 — ARMAMENT STATE

GUNS State	Load	Time	Signature	ROCKETS State	Load	Time	Signature	BOMBS State	Load	Time	Signature	OTHER State	Load	Time	Signature

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Exhibit XXIV
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

PHOTOSTATIC COPY OF DAILY MAINTENANCE FORM (TRAVELLING COPY)

Sect. 3 PRIMARY INSPECTION CERTIFICATE

Primary Inspection Completed			Primary Inspection Valid Until			
Time	Date	Signature NCO i/c	Time	Date	Signature NCO i/c	This information is to be transcribed to subsequent daily maintenance forms until validity expires. Sheet bearing names of inspection personnel is to be retained between primary inspections.
1920	29 DEC 63	G Boyd SGT.	1430	31 Dec 63	[signature]	

Item	Airframe 1	Airframe 2	Airframe 3	Airframe 4	Instrument	Electrical	Photo
Signature							
Item	Engine 1	Engine 2	Engine 3	Engine 4	Comm.	Radar	Safety Equipment
Signature							
Item	Arm. M & W	Arm. Systems					
Signature							

Sect. 4 POST FLIGHT/BEFORE FLIGHT INSPECTION CERTIFICATE

Airframe	Engines	Instrument	Electrical	Photo	Safety Equipment	Telecomm. Comm.	Telecomm. Radar	Armament M & W	Armament Systems	Inspection Completed Type	Inspection Completed Time	Inspection Completed Signature
Certified all PIs are signed for in Base L14/1										30 DEC 63	0645	[signature]

Sect. 5 PILOTS ACCEPTANCE AND HAND-OVER CERTIFICATE

CERTIFIED AIRCRAFT SERVICEABLE Time	Rank	Signature	CERTIFIED FORMS L14-1, -1A, -1B, -1C CHECKED Time	Pilots Signature	TIME Up	TIME Down	BROUGHT FORWARD 7644 25 Duration of Flight		STATE ON LANDING, S, MD, U/S (Enter defects in forms -1A or -1B) State	Pilots Signature	MINUTES	Certified Oil Dilution carried out. SIGNATURE
			1330	[signature]	1310	1405		55	S	[signature]		
			1600	[signature]	1455	1725	2	30	MD	[signature]		
			1845	[signature]								

Total Flight Time

Certified all required data transcribed to Log Set.

Date	Signature	Rank

PHOTOSTATIC COPY OF DAILY MAINTENANCE FORM (TRAVELLING COPY)

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Exhibit XXLV
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

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Date / Time	Put U/S By / Trade	Nature of Unserviceability	Rectification	Rectified By	Inspected and passed: NCO i/c	Certified Serviceable	Date / Time
20 Dec. 1600	WOLOSCHUK AFT	1/16" CRACK FOUND ON LOWER OLEO ATTACHMENT WHICH HOUSES AXLE PORT-U/C	PORT U/C OLEO ACC-17-64 REMOVED NEW OLEO STRUT REPLACED SERIAL ACC-1-55-61R	Boudreau 2110 22 Dec 63	[signature] 2130 23 DEC 63	[signature] Sgt	23 Dec 12-20
24 Dec 1300	SEIDLITZ INST	STB'D FUEL PRESS. TRANS. SER# 9916/26 U/S REMOVED	NEW FUEL PRESS TRANS. SER# 6484/42 INSTALLED.	[signature] 1530 24 Dec 63	[signature] 1935/24	[signature] FS	24 Dec 63 16 30
30 Dec 63 0645	[signature] AET	TRAVELLING COPY NOW IN USE					

Impounded at 2330 hrs. 30 Dec 63 [signature] DOTCO

PHOTOSTATIC COPY OF CHANGE OF SERVICEABILITY AND RECTIFICATION LOG

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Exhibit XXIV
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

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Exhibit XXIV
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

PHOTOSTATIC COPY OF THE WEIGHT AND BALANCE OF AIRCRAFT

ROYAL CANADIAN AIR FORCE
WEIGHT AND BALANCE CLEARANCE
— TRANSPORT —

RCAF Form F. 115C
7530-21-800-6592
Cross Reference
RAF Form 2870
USA Form DD 365F

DATE	AIRPLANE TYPE	FROM	HOME STATION
30 DEC. 63.	B170	FCKK	
MISSION/TRIP/FLIGHT/NUMBER	**SERIAL NUMBER**	**TO**	**PILOT**
SF80	9697	LFOM	

LIMITATIONS

CONDITION	TAKE OFF	LANDING	LIMITING WING FUEL
2/ ALLOWABLE GROSS WT	44000		
TOTAL AIRPLANE WT (Ref. 11.)	37447	XXXX	XXXX
OPERATING WT PLUS ESTIMATED LANDING FUEL WT	XXXX	XXXX	XXXX
OPERATING WT (Ref. 8)	XXXX	XXXX	
ALLOWABLE LOAD (Ref. 12) (use SMALLEST figure)	6553		

3/ PERMISSIBLE C.G. TAKE OFF	FROM	TO (% M.A.C. or IND.)
4/ PERMISSIBLE C.G. LANDING	FROM	TO (% M.A.C. or IND.)
5/ LANDING FUEL WT		

REMARKS
MPL 6553
PL 6551
LITE 2
PAP 6-935
66 100

TOTAL FREIGHT	5516
TOTAL MAIL	
COMPUTER PLATE NUMBER (If used)	

1/ ENTER CONSTANT USED
2/ ENTER VALUES FROM CURRENT APPLICABLE T.O
3/ APPLICABLE TO GROSS WEIGHT (Ref. 15)
4/ APPLICABLE TO GROSS WEIGHT (Ref. 18)
5/ REF. 9 MINUS REF. 17

REF	ITEM	WEIGHT	I/INDEX OR MOM/
1	BASIC AIRPLANE (From Chart C)	30239	864
2	OIL (Gals)	396	49 0
3	CREW (No.)	1006	38 4
4	CREW'S BAGGAGE		
5	STEWARD'S EQUIPMENT	120	7 1 9
6	EMERGENCY EQUIPMENT	85	4 4 3
7	EXTRA EQUIPMENT	150	4 3 1
8	OPERATING WEIGHT	31940	4 3 1
9	TAKE-OFF FUEL (650 Gals)	4656	6 5 3
10	WATER INJ. FLUID (Gals)	777	4 3 3
11	TOTAL AIRPLANE WEIGHT	37447	4 3 3

12 DISTRIBUTION OF ALLOWABLE LOAD (PAYLOAD)

COMPT	UPPER COMPARTMENTS PASSENGERS NO.	UPPER COMPARTMENTS PASSENGERS WEIGHT	UPPER COMPARTMENTS CARGO	COMPT	LOWER COMPARTMENTS PASSENGERS NO.	LOWER COMPARTMENTS PASSENGERS WEIGHT	LOWER COMPARTMENTS CARGO	WEIGHT	I/INDEX OR MOM/
A				1			700	700	3 1 2
B									
C				2			600	600	2 3 9
D									
E				3			1000	1000	1 6 0
F									
G				4			1000	1000	1 4 2
H									
I				5			1116	1116	1 7 1
J									
K				6			900	900	2 5 1
L									
M				7			200	200	2 7 0
N									
O				8	4	595	100	695	3 8 3
P									
FWD	BELLY			9	2	340		340	4 5 3
AFT	BELLY								

CORRECTIONS (Ref. 14)

COMPT	ITEM	CHANGES (+ or −) WEIGHT	CHANGES (+ or −) 1/INDEX OR MOM/
TOTAL WEIGHT REMOVED		−	−
TOTAL WEIGHT ADDED		+	+
NET DIFFERENCE (Ref. 14)			

13	TAKE OFF CONDITION (Uncorrected)	43998	4 5 3
14	CORRECTIONS (If required)		
15	TAKE OFF CONDITION (Corrected)		
16	TAKE OFF C.G. IN % M.A.C. OR IND.		86.1 INDS.
17	LESS FUEL		
18	LESS AIR SUPPLY LOAD DROPPED		
19	MISC. VARIABLES		
20	ESTIMATED LANDING CONDITION		
21	ESTIMATED LANDING C.G. IN % M.A.C. OR IND.		

COMPUTED BY _____ SIGNATURE _____

WEIGHT & BALANCE AUTHORITY W/O MURPHY SIGNATURE _____

PILOT F/L HAMELIN SIGNATURE _____

NOTE:—THIS DOCUMENT HAS RESULTED FROM TRIPARTITE AGREEMENT AND NO FURTHER CHANGES MAY BE MADE TO IT WITHOUT PRIOR CONSIDERATION BY TRIPARTITE AUTHORITIES.

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FLIGHT SAFETY MEMBER'S STATEMENT

The Flight Safety Member arrived at the scene of the crash at 1000 hours on 31 Dec 63. The impact evidence and the wreckage was studied in detail at the site in collaboration with the AIB representative, and the power plants and various aircraft components were inspected in a hangar at 1 Wing, whereby assistance was afforded by Mr. Stone of the Bristol Aero Engine Co., as well as AIB.

The general indications of the wreckage are included in the Technical Member's statement. Since the evidence of the GCA control and two of thesurvivors suggested that the major problem was an unexplained loss of some 250 feet of altitude the detailed investigation of the aircraft was concentrated upon the power plants, the fuel system, the engine controls, and the flight controls.

DETAILED STUDY OF POWER PLANTS :

Both power plants had broken away from the wing at the time or just before it came to rest in its final position. The power plants thus faced the reverse direction of the flight path, and were located under their proper side of the wing.

Starboard Power Plant :

The starboard engine had not been subjected to any fire and the propellor was still attached. Except for the oil tank which had been torn off, the power plant was complete, although the rear section had been damaged. The following components were subjected to minute inspection :

(a) SUMP OIL FILTER - found clean and there were no excessive metal particles on the magnetic plugs.

(b) FUEL PUMP - free to rotate, quill drive intact, pump contained residual fuel.

(c) The hold-down studs for all cylinders were found secure.

(d) PROPELLOR - the spinner was crushed and folded around the propellor blades, which were free to rotate in the pitch angle. All four blades were at different pitch angles. Three blades had the leading edge towards the rear of the engine, one blade had the leading edge forward. The tips of two propellor blades (N°'s 3 & 4) were broken off and curled forward. N°'s 1 and 2 blade tips had no curl. There was some rotational damage to the cooling fin blade tips. All four propellor blades had broken free from the bevel rotating gear, and the shims were visible from the front and slightly displaced.

The reduction gear casing had cracked and was pulled away approximately 1/2 an inch from the engine on the front inboard side. The propellor reduction gear was driven into the engine housing front at impact, and the teeth marks

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show that there was no rotation at that time.

The propellor dome indicates that the propellor was at 27° pitch. The starboard engine rotary shutter was jammed in the ram position. The CSU was 6/32" from the full fine stop.

Port Power Plant :

The port power plant had suffered considerable fire damage. The fire appeared to have been confined to the oil initially; later magnesium parts such as the entire engine housing had been ignited. Despite the proximity to the wing and the fact that N° 1 tank on the port wing had been torn open at the impact, which permitted the fuel to escape, the fire was entirely confined to the engine and its immediate neighbourhood (including the second pilot and his seat). The auxilliary section of the engine had been reduced to rubble by the fire. Detailed inspection was only feasible as regards :

(a) CYLINDER HOLD-DOWN BOLTS - all found secure.

(b) PROPELLOR - the propellor and the reduction gear had separated from the engine. The reduction gear had been driven into the engine hub/section at impact, and similarly to the starboard engine - the teeth marks indicated only very little rotation of the gear (anti-clockwise).

One propellor blade tip was curled forward, while three were curled backwards. N°'s 1, 2 & 3 blades were still attached to the bevel gears, while N° 4 blade had broken free; the shims had piled up and the bronze bearing race had broken. The entire dome was contaminated with bronze particles from the bearing or cogs. There was still oil in the reduction gear housing. The bevel pinion thrust races were free to rotate.

There was no rotation damage to the cooling blades.

While the port engine CSU was in the coarse position (pulled by wires), the port propellor dome indicates that the propellor was at 26° pitch (i.e. full fine).

STUDY OF THE FUEL SYSTEM :

Five of the wing fuel tanks contained fuel after the impact. The N° 1 port tank was found empty, however, the main spar had broken directly in front of that tank. The tank appears to have burst at impact.

The individual OFF-ON cocks for all starboard tanks and N° 1 port tank were located in the wing. They were intact and all lockwired open. The collector tank and booster pumps in the starboard nacelle

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were intact and serviceable, and still contained fuel. The port collector tank and booster pumps were squashed under the wing at impact and were inaccessible.

The main fuel cocks were both located and were both found in the open position. The crossfeed cock was located and found in the closed position. The engine isolating cocks were both in the open position.

ENGINE CONTROLS :

The centre pedestal was located and subjected to minute study. The fact that the pedestal had been shielded to some extent by the cockpit floor (cockpit was upside down), and that the impact force had been transversal to the pedestal made it possible to determine the position of all control handles by scrape marks, etc., with accuracy.

THROTTLES & PITCH CONTROLS	- deep marks made by the micro-switch operating arms on the pulley cams showed that both throttles were fully forward at impact, and that both pitch controls were at full fine (fully forward) at that time.
FUEL COCKS	- very pronounced bending of the hooks that lock the handles at the rear position shows conclusively that both cocks were "ON" (i.e. fully aft).
CROSSFEED COCK	- a mark on the surface of the handle quadrant made by the spring connecting the two fuel cock locking hooks shows clearly that the crossfeed was "OFF" (i.e. "ON").
FEATHERING BUTTONS	- the filaments of the bulbs in both feathering buttons indicate that the bulbs were not burning when they were broken.
AUTO COARSE PITCH	- the Auto Coarse Pitch test bulb filaments were not burning when broken.

STUDY OF FLIGHT CONTROLS :

The trim settings on the centre pedestal were all within 1/2" of neutral :

Aileron - 1° port wing heavy
Elevator - 1½° nose up
rudder - neutral (zero)

The flap lever was in the half position.

Particular attention was paid to the elevator control system. The complete control cable was recovered. Although it had broken in some places at the impact, all breaks were of the tension type with flossy ends. There were no cuts or signs of fouling, no kinks or abrasive strand failures. The elevator trim cables were also traced and were completely serviceable still from the trim tab up to the entry point into the cockpit. There were no signs of fouling in the entire system.

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Study of the broken-off port stabilizer showed that the elevator had been in the full up (or very nearly so) at the time of impact with the treetop that broke off the stabilizer. The flight path of the aircraft from the time of first contact with treetops and until the starboard wingtip contacted the ground (at which time the aircraft had a right bank of at least 90°) is commensurate with full elevator-up condition. Loss of the port stabilizer with the elevator near neutral can be expected to induce a left roll. However, if the port stabilizer is torn off immediately after the pilot has imparted negative lift to the stabilizer by full elevator-up movement, a right roll can be expected.

CONCLUSION

The evidence proves beyond a reasonable doubt that :

(a) the starboard engine functioned correctly and delivered high power;

(b) both propellors functioned properly and their position was commensurate ith full power setting;

(c) the pilot had taken no feathering action on either engine;

(d) there was adequate fuel onboard and it was being fed properly to the engines;

(e) there were no C of G or other trim problems;

(f) The flap position was correctly half down, commensurate with the stage of flight.

The evidence indicates circumstantially that :

(a) the port engine operated correctly.

On the basis of the technical evidence it is concluded that there were no problems existing in the aircraft as regards power plants and elevator controls at the time of the impact.

GOH. Poulsen
Flight Safety Member.
(GOH Poulsen) F/L

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STATEMENT BY THE BOARD

The Board of Inquiry arrived at 1 Wing RCAF, Marville, France at 0600Z 31 Dec 63, to investigate the circumstances which resulted in the accident to Bristol aircraft N° 9697. The accident occurred at 2056Z, 30 Dec 63, at approximately 1½ miles from the touchdown during a GCA.

Preliminary discussions with the CO of 1 Wing RCAF established that the aircraft was SF 90 from Gatwick, England, carrying six crew, five passengers and 5516 lbs of freight. Eight of the personnel on board were found dead at the scene of the crash. There were three survivors. No eye witnesses to the accident had been located. A copy of the CO's 24-hour report is attached as Appendix "D".

The Board proceeded to question witnesses, examine the wreckage and peruse relevant documents and data to establish the pertinent events and facts which resulted in the accident.

INFORMATION

Bristol aircraft N° 9697, as SF 90, departed Gatwick for Marville at 1858Z, 30 Dec 63. A copy of the Flight Plan is attached as Appendix "E". The initial portion of the flight was flown at 7000 ft, which was above all cloud and was apparently uneventful. Perusal of the tape recording transcription from Gatwick and London radar indicated departure from the UK was normal. No aircraft problems were reported by the pilots and two of the survivors with considerable air experience, 200637 W/C RJ Middlemiss and 200748 LAC E Cougle considered the flight normal in all respects up to the point of impact. Approaching Marville, the aircraft was instructed to descend to 4000 ft and was passed from Moselle Control to Marville Approach Control at approximately 22 miles distance. GCA established contact with the aircraft, and proceeded with a straight-in approach to runway 120. The tape recording of the GCA is clear, and indicates that no aircraft problems were reported by the pilots up to the point where the aircraft started final approach at nine miles. From this point on, no further transmissions were required from the aircraft, and none were given. A copy of the tape recording transcription is attached as Appendix "F".

This transcription indicates that the aircraft was on the glide path at 2¼ miles from touchdown, and had made a correction in azimuth, and was regaining the centre line from the left hand side. At 1⅝ miles, the approach was still apparently satisfactory, but twelve seconds later radar contact with the aircraft was lost. Time 2056Z.

The Search and Rescue facilities were alerted at 2110Z and because the GCA operator advised that contact was lost at 2½ miles, the search commenced in that vicinity. Since contact was actually lost at less than 1⅝ miles, and as there was no major fire or explosion to guide the searchers, the crash was not located until 2345Z.

To brief the Board members on GCA operating procedures and techniques, the services of 16644 F/L Carpenter and 206672 FS Stacey of 3 Wing RCAF were obtained. These personnel acted in the capacity of specialist advisors to the Board and were subsequently called as witnesses (Witnesses N° 10 and 9).

GCA EQUIPMENT MPN 501 (V)

The GCA unit was shut down for normal weekly maintenance at 1200Z 30 Dec 63 (4th Witness). The maintenance was completed at about 1530Z and a GCA on a T33 flown by F/L Harvey, OC WIF, took place at about

1545Z. The GCA run was controlled by LAC Marshall (5th Witness) and was reported as completely satisfactory by both the pilot and controller.

Immediately following the accident, the GCA unit was quarantined. Unfortunately, because of low cieling and visibility the- in fog, it was not possible to flight check the unit until 2 Jan 64. Mr. K. O'Brian, Gilfillan Technical Representative, stationed at 2 Wing RCAF, Grostenquin proceeded to Marville, and together with the Board and GCA Maintenance personnel checked the unit for technical defects. No defects were found and the subsequent flight checks indicated that all aspects of the unit, glide scope, antennae, calibration, etc., were operating correctly. Further, the experienced controller on duty considered the set was operating normally. The GCAunit was released from quarantine at 1600Z, 2 Jan 64.

METEOROLOGICAL CONDITIONS

The reported weather conditions at Marville at the time of the accident were below GCA limits. The weather was reported to the Tower and subsequently to the aircraft as 150 ft overcast with three miles visibility. The altimeter settings obtained from the 1 Wing RCAF Meteorological Section for 2000Z and 2100Z, 30 Dec 63, were 30.32 and 30.30 respectively. The weather report states specifically that airframe icing would not be encountered.

EFFECT OF METEOROLOGICAL CONDITIONS ON RADAR (GCA)

The effect of weather on the GCA radar was thoroughly discussed with specialist radar personnel, both controllers and technical and the Gilfillan Technical Representative. The Board was satisfied that the weather which prevailed at the time would not affect the GCA equipment adversely.

THE GCA OPERATOR

The Board determined that [redacted] GCA controller for the crashed aircraft reported for duty at 1530Z, 30 Dec 63. Inquiries into this NCO's habits during the preceding 24 hours did not produce any relevant factors.

The Board determined that [redacted] had done his last GCA on the 5 Dec 63 and then proceeded on leave. He reported for duty on 30 Dec 63 for the evening shift which commenced at 1600Z and was alone in the GCA van while controlling aircraft N° 9697. This was the first GCA in twenty-five days done by [redacted]

A perusal of this NCO's R1 indicated that he completed the radar controller (GCA) course on 23 Nov 62. The assessment report states that he had difficulty with all phazes of the training and was assessed as a "below average" in operating and practical proficiency. The assessment concludes with a statement that "with field experience he should become an average controller". The statements of the third and sixth witnesses indicate that [redacted] is considered a satisfactory GCA controller.

With respect to experience, it was established that this NCO was qualified to station limits (200½) on 28 Oct 63 (3rd witness) at which time he had controlled a total of 1248 approaches. At the time of the accident this total had increased to 1326. He is due for his first flight check since qualifying on 28 Jan 64.

On 2 Jan 64, after the GCA had been flight checked and declared serviceable, the Board observed [redacted] while he controlled a Bristol on three GCAs. It will be appreciated that this NCO was noticeably nervous under the circumstances, nonetheless, significant observations on his operating techniques were made as follows :

(a) A high gain control was used on all runs and the gain was not decreased appreciably as the target approached touchdown.

(b) The STC control was not used on any run.

(c) It was difficult to see how the exact position of the aircraft in relation to the glide scope could be determined, particularly when the target extension merged with the ground return at about 1¼ miles.

(d) As the target moved closer to touchdown, particularly inside four miles, little or no attention was paid to the servo control with the consequence that the set was not servoed accurately on the target.

It was apparent that either inexperience, lack of supervision or a combination of both factors had resulted in the operator not using the GCA equipment efficiently. The proficiency demenstrated was considered unsafe by the Board.

GCA TAPE RECORDING

The GCA tape recording (transcription attached as Appendix "F") was studied in detail. The following observations are pertinent :

(a) While on surveillance radar, the GCA operator erred in that he had the 60 mile range rather than the 30 mile selected. While this was not significant, on this particular approach, it could be with respect to other traffic and safety altitude.

(b) By timing the interval between range markers on final the aircraft ground speed on approach was established at a steady 109 knots. Although the pilot reported the speed would be 100 knots, the normal speed on final for a Bristol is 100/105 knots. Wind and temperature effect satisfy the 109 knots obtained.

(c) The aircraft did not advise that the cockpit check was complete and the GCA did not query this fact.

(d) The GCA operator advised that the aircraft was at 7½ miles and when it was actually at 8¼ miles.

(e) The aircraft intercepted the glide path at 6¼ miles whereas it should have been six miles with the aircraft at 2500 feet ASL.

(f) Minor changes in azimuth to regain the centre line were given as the aircraft approached, whereas it is considered better technique to regain the centre line as far out on final as possible.

(g) The GCA operator did not advise the tower of the aircraft's position until 2¼ miles. This information should be passed approaching three miles.

(h) No confirmation of undercarriage down at three miles was requested.

(j) Last mention of the glide path by the GCA operator was at 2¼ miles, yet it was twenty six seconds later before radar contact was lost.

(l) The GCA operator lost radar contact twelve seconds after the aircraft was reported at 1¼ mile.

(m) The GCA operator advised the tower that contact was lost at 2½ miles (actually lost at 1¾ miles).

WRECKAGE

It was evident from viewing the impact path of the aircraft in the trees, that the aircraft struck the first few trees at a relatively flat angle. While it was impossible to establish the correct angle, subsequent tests with a Bristol aircraft descending at 500 feet per minute and flown approximately 200 feet below the GCA glide path indicated that the test aircraft would have made contact with the trees at approximately the same angle indicated by the path of the crashed aircraft.

From examination of the wreckage (Flight Safety Member's statement) the Board concluded that the aircraft was in a serviceable and controlled state immediately prior to the impact. Further, the evidence associated with the impact path of the aircraft indicated that when the pilot realized he was low on the approach (either by first contact with the tops of the trees or when levelling at minimum approach altitude) he pulled back on the control column and applied full power. Rotating the aircraft at that point caused the port stabilizer to contact a large tree which sheared the stabilizer from the aircraft, and consequently all control was lost.

No pertinent factors with respect to aircraft operating procedures were revealed.

AIRCREW

Although there were six aircrew authorized on this flight (F17, Appendix "E"), only the pilots were considered possible factors.

F/L Hamlen was assigned as Captain of the aircraft and duly authorized the flight in accordance with existing regulations. This officer was an experienced and qualified pilot, holding a valid instrument rating. A perusal of all relevant documents, R1, Confidential File, Training File and Pilot's Log Book substantiated his OC's assessment (13th witness). No significant factors were revealed that might have contributed to the accident. A photostatic copy of the last page of this pilot's log book is attached as Appendix "G".

F/L Clouthier was assigned as first pilot (co-pilot) for this flight. It was established by the Board from the position of the bodies and by the pilot's seat, that F/L Clouthier was at the controls of the aircraft at the time of the accident. This officer was also an experienced and qualified pilot, with considerable experience on Bristol aircraft and holding a valid instrument rating. Perusal of this officer's relevant documents did not produce any pertinent factors. The autopsy report on this officer did not reveal any medical cause factor. A photostatic copy of the last page of this officers Pilot's Log Book is attached as Appendix "G".

SURVIVORS

LAC Cougle was interviewed in hospital. It was determined this airman was sitting with the passengers at the rear of the aircraft for the intended landing (normal crewman position), listening through a head set to the approach transmission. He considered that everything was normal and that the first awareness he had of impending danger was something hitting the sides of the fuselage (assumed to be the tops of the trees). Immediately thereafter he lost all awareness until some time later when he was lying on the ground. Since this airman could not remember anything abnormal during the approach (no sensation of a sudden loss of altitude or

change of power etc), it was not considered necessary by the Board to obtain a statement).

Additionally, W/C Middlemiss also sitting at the rear of the aircraft could not remember any peculiarities in the approach except that he was aware of something hitting the fuselage. He does, however, seem to remember engine power being applied which was followed by a "jar thudding shock". The next thing he remembers is being on the ground beside his daughter. Again no statement from this witness was considered necessary.

PASSENGERS

The passengers as listed on the front dover of these proceedings were authorized by Air Division Message MVP 600 dated 24 Dec 63. They are not considered a factor in the cause of the accident.

SEATING ARRANGEMENTS

Passenger seats in the Bristol aircraft are installed facing aft immediately inside and forward of the entrance door which is at the rear of the fuselage on the left hand side. Seats are installed two on each side of the centre aisle, side by side. At the time of the crash the crew and passengers were seated as shown in Appendix "J".

CLAIM AGAINST THE CROWN

It was not possible to establish through the French authorities the exact amount of the claim against the Crown. However, it appeared likely that a claim would be submitted in the order of approximately $300.°°. It should be noted that the aircraft crashed, in so far as can be determined, on French government property. The only damage incurred were a few trees destroyed. Access to the crash was via a farmer's field, with the only effect being numerous wheel ruts.

SEARCH AND RESCUE FACILITIES

The search and rescue plans and facilities were found adequate with the exception of communication equipment. It was evident that communications between Tower, Operations, AFP and CE vehicles was not adequate. In addition the search parties were hampered because of inadequate field communications equipment. This aspect was considered outside the terms of reference of the Board and it was apparent that a separate study of the communications facilities is required.

DETERMINATION OF THE CAUSE

It was apparent that whatever caused this accident occurred after the aircraft started final GCAapproach. Yet the GCA tape recording indicates that the approach was normal and that radar contact was lost 12 seconds after passing the 1¾ mile mark. Assuming the aircraft was on the glide path at this point, the aircraft should have been 350 feet above the trees or 1395 feet ASL (Appendix "H"). The GCA controller was adamant that radar contact was lost almost instantaneously (12 seconds later, after 1¾ miles). At this point the aircraft should have been 240 feet above the trees. Since a full radar sweep on precision is once per second, this effectively means that the aircraft suddenly (in one to two seconds) increased its rate of descent from 400 to 500 feet per minute to about 12,000 feet per minute. As this is impossible for obvious reasons, the glide scope, GCA equipment and operator and pilot techniques were immediately suspect.

Nevertheless, the aircraft wreckage was thoroughly investigated, but it was established that the aircraft was technically sound in all respects with no evidence of even a minor aircraft malfunction. Both

aircraft cockpit altimeters were found with the correct settings and no special problems could be associated with this area. An aircraft radio failure was considered, but since this should have resulted in an automatic overshoot it was disregarded as a factor.

Although the weather was marginal, the crash occurred before the aircraft reached the point where GCA limits are encountered. Had the aircraft reached GCA minimum, at 200 feet, and one half mile, and not been visual, it is assumed a missed approach procedure would have been initiated by the pilot. Since it is unlikely that an experienced instrument pilot would attempt to obtain visual contact in the weather that prevailed - the weather conditions were not considered a factor.

However, it was evident that the aircraft was descended slightly below minimum approach altitude. Minimum approach altitude of 1106 feet ASL (200 feet above aerodrome elevation of 906 feet) should normally be reached at one half mile from touchdown. At the point of first impact at 1,1/3 miles, tops of the trees are about 140 feet above aerodrome height or 1046 feet ASL. During the hour between weather sequences, altimeter setting had changed from 30.32 to 30.30 which would account for a slight unknown error to the pilot of 20' and which would have put the tops of the trees at 1066 feet ASL on the aircraft altimeter. (Most altimeters have some slight error which is normally noted by the pilot prior to takeoff, but since there was no way to establish this error, this factor was disregarded). Therefore, since the minimum approach altitude at Marville is 1106 ft ASL it was evident that for some reason the aircraft had descended below the minimum approach altitude by approximately 40 feet at the point of impact.

While all evidence indicated that the aircraft was pulled up and power applied when initial contact with the trees was made, it is possible that this occurred simultaneously with the pilot's realization that he had descended to or below minimum approach altitude.

Notwithstanding that the aircraft was slightly below the minimum approach altitude, the fact that this altitude was attained at 1.1/3 miles from touchdown on an apparently normal GCA approach, rather than 1/2 mile, was puzzling.

The GCA operation was investigated and several pertinent factors became evident. The RAPCON and GCA controllers were observed in operation and it was noted that several controllers did not use the equipment in an efficient manner to produce an acceptable target return. The major errors in operating techniques were :

(a) Use of excessive gain.

(b) Not observed on the target particularly when the target was inside three miles.

(c) Not being able to assess the relation of the target to the glide path accurately (because of high gain) and particularly when the target merged with the ground clutter at about $1\frac{3}{4}$ miles.

(d) One controller had acquired a habit of continuously glancing at the surveillance scope for short periods while controlling an aircraft on final approach when his full attention should have been on the precision scope.

(e) On three occasions it was noted that the current weather posted was not up to date, and in fact had changed considerably.

The general impression of the RAPCON organization was one of "sloppiness" and a general lack of professionalism. At the same time two of the observed controllers displayed very satisfactory operating proficiency.

[redacted]s difference in the operating proficiency of the controllers indicated clearly how an accident might occur because of inefficient controlling. Further it was noted that the target return obtained by the controllers differed considerably and the Board was of the opinion that an equipment problem might be associated with the controlling problem, even though the equipment had been cleared by technical specialists. The services of the 9th and 10th witnesses were obtained and both these witnesses on first observing and working the equipment commented that the target return was neither normal nor satisfactory. Further investigation of this aspect was carried out, specifically working a Bristol aircraft, but including all types, which revealed that at times an extension of the target return was being obtained, which was more noticeable upwards than downwards. Although this extension of the target was inconsistent in that it was not always present, it gave a return sometimes equal to or greater in intensity than the main target return. Further, it was most noticeable when a relatively high gain setting was used. It was noted that with experienced controllers, using a low gain setting, that this target extension was reduced to the point where the target return was acceptable. In fact, it was apparent that proficient controllers were unconsciously, by efficient use of the equipment, controlling the target return so that the referenced extensions were not readily apparent.

Since the reason for this peculiarity in the equipment was not evident to the Board, it was demonstrated to the technical personnel, along with the Gilfillan field service representative (12th witness) who are investigating this problem further. At the time of adjournment of the Board this technical investigation was still continuing.

Further tests were conducted in an attempt to relate this target extension to the cause of the accident. It was established that by using a moderate to high gain setting the radar return from a Bristol aircraft would intercept the glide path at 6 3/4 miles with the aircraft flying at 2500 feet AEL. This corresponded to the information obtained from the GCA tape recording. (Glide path interception should have been at six miles). Descending the aircraft at a steady 400 to 500 feet per minute from this point, using the bottom of the upward target extension and the top of the actual target return as the approximate centre of the return, the test aircraft would have flown into the trees at the same point as the crashed aircraft. Six consecutive GCAs confirmed this fact.

As a final experiment, the controller of the crashed aircraft, [redacted] was asked to control a Bristol aircraft on two approaches. On both approaches the high gain setting previously noted was used unconsciously by the operator, the target extensions were noticeable and [redacted] used the upper part of the main target return where it merged with the target extension as the centre of the radar return. Although the aircraft was not in danger on these runs, it was in fact established approximately 50 - 75 feet below the glide path with the Cpl calling the aircraft as on the glide path. Again, because of the high gain setting, when the target merged with the ground return at 1 3/4 miles it was virtually impossible to be certain of the aircraft's position in relation to the glide path. It was further noted that after the aircraft passed the three mile mark the servo control was not used.

RELATED ASPECTS

The Board determined that the RAPCON unit at 1 Wing was organized basically as per CAP 342, Volume 11. Under the Chief Controller RAPCON there is a Chief Controller GCA, and the radar GCA controllers

e organized under shift supervisors who are responsible to the Chief Controller GCA. The Board noted apparent weaknesses in CAP 342 in this area which applied to the 1 Wing staff as follows :

(a) Chief Controller (RAPCON). CAP 342, Volume II, para 201.32 states that "the Chief Controller shall be a qualified terminal controller and responsible for the supervision and efficient operation of the RAPCON. In addition he is to conduct such training and supervision as necessary to ensure a satisfactory standard of operational proficiency". Since this controller does not necessarily require experience or qualification on GCA he is dependent on the Chief Controller (GCA) to ensure that the responsibilities are satisfied. It was apparent to the Board that unless the Chief Controller RAPCON h_d some experience with the GCA that the necessary supervision particularly with reference to GCA controller's proficiency, could be non-existent. At 1 Wing the Chief Controller RAPCON had no experience with the GCA equipment (11th witness).

(b) Chief Controller (GCA). CAP 342, Volume II, para 201.23 states that "the Chief Controller shall be a qualified radar controller, normally the senior in rank." This situation exists at 1 Wing in that [redacted] is the senior GCA controller. This NCO was observed controlling aircraft on precision GCA and it was noted that he did not use the equipment in a proficient manner.(10th Witness). In fact it was considered that because of the high gain setting used, along with inaccurate use of the servo control that this controller could not accurately determine the position of the aircraft in relation to the glide path close in on final. He repeatedly advised the pilot that he was on the glide path when, because of the high gain setting used the target return could not be seen clearly as it merged with the ground clutter. Proficient use of controls would have eliminated this problem. Yet, this NCO is responsible for the supervision, training and practical proficiency of the other controllers. In this respect four qualified controllers observed while operating aircraft under GCA were considered unsafe. These controllers used the equipment in the same manner as [redacted]. One of these controllers was [redacted] who controlled the crashed aircraft.

The statement of the witness (3rd) states that his last proficiency check was assessed by F/L Ruttle, the Chief Controller RAPCON. With reference to previous discussions in this statement, F/L Ruttle was not in the Board's opinion, qualified to assess this controller's ability in a professional manner. Further, it was finally ascertained that this NCO had actually only been qualified to station limits for about five of the last ten years, and that the last time his controlling was supervised by a knowledgeable supervisor was at Trenton in 1960.

The subject of [redacted]s log book was thoroughly investigated. It is obvious that when the original was lost as submission through the proper channels would have produced a new book at that time. The Board brought to the attention of this witness the requirements of CAP 342, Volume II, para 206.06 with regards to the Chief Controller (GCA) responsibilities of endorsing log books re qualifications. That he had no log book of his own demonstrated a lack of responsibility to the Board. It also indicated that the Chief Controller RAPCON had not administered his responsibilities properly.

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It was the Board's opinion that [redacted] should be removed from his responsible ~~duties and~~ position and given further GCA training under adequate supervision.

In addition, it was the Board's firm opinion that while it is prefereable that the senior in rank should be the Chief Controller GCA, adequate qualifications are also necessary. To this extent, some manner of measuring the qualifications, probably by a required number of IFR GCAs along with a written examination on technical and operating techniques appeared necessary.

(c) Shift Supervisors (GCA) - CAP 342, Volum II, para 201.32 indicates that a shift supervisor is to be in charge of the controllers on shift and he is to ensure that the equipment operates satisfactorily during his tour of duty. Para 201.41 further states that the shift supervisor should be a qualified controller. This indicates that any qualified controller regardless of experience could be made a shift supervisor. Since there are times when only one GCA controller is required to be on duty (minimum traffic), the Board studied and discussed this aspect carefully. It was apparent that controllers with minimum experience may be qualified to station limits. It was equally apparent a qualified controller with limited experience may not be aware of how satisfactorily the equipment is working. Consequently, it seemed that some method of determining the qualifications necessary for shift supervisors should also be established, i.e. experience level.

(d) GCA Controllers - CAP 342, Volume II, para 203.31 gives the authority for initiating radar controller ~~pfe~~ proficiency checks. On these checks it is apparently standard practice for the controller to be assessed by the local chief controller (GCA). Since the assessor is assessing the proficiency of personnel they have supervised in training, it appeared that a higher standard could be obtained for if the assessment was conducted by an independent and unbiased assessor.

It was concluded that the best means of accomplishing this would be for the chief controller GCA from some other unit or qualified command staff to conduct these checks.

The Board concluded that the proficiency and experience of some RAPCON personnel at 1 Wing was not adequate, and that this situation must apply to other units of the Air Division. Further, the responsibilities and necessary qualifications for these personnel is not adequately defined in CAP 342. It was the Board's opinion that in addition to specific areas mentioned, the classification of GCA controllers as either qualified or not qualified was not realistic. Some measure of a controller's experience and proficiency is obviously required, and it was concluded that this should be accomplished in stages, i.e. qualified from VFR to Surveillance limits and then from Surveillance limits to Station limits.

In addition, the Board realized that further investigation of the SATCO organization could have been undertaken since it was clear that the professional discharging of responsibilities was to say the least, inadequate. However, it was considered that the major problems had been uncovered and that further action would be taken as necessary by the local authorities as a result of these proceedings.

The GCA controller, [redacted] was a victim of circumstances in this accident in that because of poor operating proficiency he did not recognize an unsatisfactory condition on the radar scope.

The Board is of the opinion that this NCO should be declared "unqualified", transferred to another unit and given further training under adequate supervision before being requalified as a GCA controller.

In the interests of safety and to assist the pilots in determining required altitude on GCA approaches, it was considered that two additional mandatory transmission be added to the GCA patter. First, prior to final approach, the pilot should be advised the correct range for the altitude being flown, that glide path interception should take place. Secondly, at three miles on approach when a transmission break is made, for the pilot to confirm "undercarriage down", the GCA controller should add in his transmission the correct altitude for the aircraft at that range. This should direct the pilot's attention to the altimeter and provide him with the information and means of assessing descent progress.

With reference to the statement of the 13th Witness, it was noted that the co-pilots at 109 KU are not in the habit of monitoring the approach altitude, particularly when the critical minimum approach altitude is reached. The Board considered that in transport operations, with two pilots available, the co-pilot's primary function when on either a GCA or using other approach systems, should be to advise the pilot that the minimum approach altitude is about to be reached, and then to look ahead and advise when visual flight has been attained.

Since this inquiry established that the operating proficiency of several controllers at 1 Wing were unsafe, it was the Board's opinion that a possible hazard in this respect might also be evident at other Wings in the Air Division. Consequently, as a safety precaution an inspection of all Air Division RAPCON controllers is warranted.

The question of controllers conducting GCA after having been away for some period of time was discussed. It was revealed that most experienced controllers preferred to carry out a few runs under known VFR conditions if they have been off controlling for more than a week. While there are no existing orders covering this aspect, the Board considered that good supervision would ensure that no controller would be permitted to run GCAs after an extended lay-off without first having some practice. However, since the Chief Controller GCA at 1 Wing admitted to the Board that he did not think this action necessary because qualified controllers do not get out of practice in short periods of time, it was evident that some yardstick in this area is necessary. Discussions with personnel in the operating field indicated that after a seven to ten day lay-off a few practice runs in VFR conditions are warranted.

It was noted that controllers at 1 Wing did not always allow for a transmission break at three miles for the undercarriage check when controlling Bristol aircraft. The reason for this is obvious since this aircraft does not have a retractable undercarriage. However, as this procedure might lead to an oversight when controlling other aircraft it was considered by the Board that this three mile check should be mandatory with all GCAcontrollers regardless of the aircraft type or configuration.

SUMMARY

In summarizing it was evident that the GCA radar return produced on this equipment was abnormal because of some undetermined technical defect. The relatively inexperienced controller misinterpreted this defect, which was displayed as a target extension of the actual return, and unwittingly descended the aircraft on a glide path approximately 160 - 175 feet below the normal glide path. Adequate supervision and training of controlling techniques would have precluded this error. Finally, the pilot descended the aircraft slightly (approximately 40 feet) below the minimum approach altitude. This sequence of events resulted in the crash.

In the Board's opinion, the factor of greatest magnitude was caused by the GCA controller, who, because of lack of proficiency, accepted an unsatisfactory target return as an acceptable target.

The Board adjourned at 1300 hours, 17 Jan 64.

Signature of the Board.

(OB Philipp) W/C
President

(SE Mayer) F/L
Member

(GJ McDowell) F/O
Member

(JAOA Savoie) F/L
Member

(GOH Poulsen) F/L
Member

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Findings :

The Board found that :

(a) The primary cause of the accident was - "Ground".(Flying Control)

(b) There were three major contributing causes :

(i) Briefing (Supervision)
(ii) Aircrew (Carelessness)
(iii) Material (Undetermined)

(c) All flying and aircraft maintenance orders were complied with.

(d) The following personnel were killed in the accident :

(i) F/L Clouthier - pilot
(ii) F/L Hamlen - pilot
(iii) F/L Walshe - Navigator
(iv) F/L Johnson - Navigator
(v) Sgt Bach - passenger
(vi) Mrs Bach - passenger
(vii) Master Bach - passenger
(viii) Mrs Middlemiss - passenger

(e) The following personnel were injured in the accident :

(i) W/C Middlemiss - supernumerary crew
(ii) LAC Cougle - crewman
(iii) Miss Middlemiss - passenger.

(f) The following personnel were on duty at the time of the accident :

(i) F/L Clouthier - pilot
(ii) F/L Hamlen - pilot
(iii) F/L Walshe - navigator
(iv) F/L Johnson 9 navigator
(v) W/C Middlemiss - supernumerary crew
(vi) LAC Cougle - crewman.

(g) The operating proficiency of the GCA controller, [redacted] was not satisfactory.

(h) The operating proficiency and supervision of the Chief Controller (GCA), [redacted] was not satisfactory.

(j) The GCA equipment MPN 501 (V) produced an unsatisfactory radar return. (The cause of this defect had not been determined when the Board adjourned).

(k) The qualifications defined in CAP 342 as required for a Chief Controller (RAPCON) are not adequate.

(l) The qualifications defined in CAP 342 as required for a Chief Controller (GCA) are not adequate.

(m) The qualifications defined in CAP 342 as required for a Shift Supervisor (GCA) are not adequate.

(n) The GCA controller, [redacted] did not conduct an approach for twenty-five days.

(o) The Chief Controller (GCA) was not proficiency checked by a qualified GCA supervisor.

(p) The Chief Controller (GCA) conducts proficiency checks on his unit's GCA controllers.

(q) It is possible that because of the inadequacies of CAP 342, the conditions specified in Findings g, h, k, l, m, o and p exist at other units.

(r) The cla sification for GCA controllers as either qualified or unqualified is not adequate.

(s) The altitude information transmitted to the aircraft on GCA is not adequate.

(t) The co-pilots at 109 KU are not in the habit of monitoring the descent during approach for the minimum approach altitude.

(u) The L14/1B entries were not properly certified in accordance with EO 00-50-01.

(v) There will be a claim or claims against the Crown.

(w) The search and rescue facilities were adequate with the exception of communications facilities.

Recommendations :

The Board recommends that :

(a) [redacted] GCA controller 1 Wing, be declared unqualified but retained as a GCA controller, transferred to another unit and given adequate supervision and training.

(b) [redacted], Chief controller (GCA) 1 Wing, be declared unqualified and given adequate supervision under training as a GCA controller, and further, this NCO not be employed in a supervisory capacity.

(c) The cause of the unsatisfactory radar return produced by the GCA equipment be established by technical investigation.

(d) Chief Controllers (RAPCON) who are respon ible for the supervision, training and operational proficiency of GCA controllers be qualified in the proficient use of GCA equipment, at least to surveillance limits.

(e) Chief Controllers (GCA) be qualified for this responsible position by some measurable means, i.e. minimum number of IFR approaches, yearly examinations on technical and operating techniques and semi-annual proficiency checks.

(f) Shift Supervisors (GCA) be qualified by some measurable means, i.e. minimum number of IFR GCAs, examinations on technical and operating techniques and semi-annual proficiency checks.

(g) GCA controllers after a seven-day absence from controlling be given at least three practice approaches before being permitted to control IFR traffic.

(h) Proficiency checks on GCA controllers be conducted by the Chief Controller GCA from some other unit, or by qualified Command or Division staffs.

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(j) The proficiency of GCA controllers at all units in Air Division be checked for safe operating techniques.

(k) GCA Controllers be classified and trained in stages from VFR to Surveillance limits and then to station limits, with a specified time period between stages.

(l) Two additional GCA transmissions be added as standard and mandatory, as follows :

(i) Before final approach the pilot be advised the correct distance for glide path interception for the altitude being flown.

(ii) At three miles when the GCA controller breaks the transmission for confirmation of undercarriage down, the transmission to include the correct altitude for that distance.

(m) It become standard procedure for co-pilots at 109 KU to monitor the descent during an approach and to advise the pilot ~~fe~~ of the minimum approach altitude being reached.

(n) The requirements of EO oo-50-1 re certification of entries in the L14/1B be brought to the attention of the OC, 109 KU.

(o) The communications requirements at 1 Wing between Tower, Operations, AFP and CE vehicles and ~~for~~ field ~~searchers~~ be examined by a separate study.

Signature of the Board :

(OB Philp) W/C
President

(SE Mayer) F/L
Member

(GJ McDowell) F/O
Member

(JAOA Savoie) F/L
Member

(GOH Poulsen) F/L
Member

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Appendix "D" to
Board of Enquiry
Convened at 1 Wing RCAF,
Marville, France on
30 Dec 63

FM : 1 WG MARVILLE

TO CANAIRHED

INFO CANAIRDIV
2 WG GROSTENQUIN A 0650 31 Dec

COS PERSONAL 24 HOUR REPORT PD FURTHER TO CRASH MESSAGE AO 649 FROM 2 WG 31 DEC PD BRISTOL AIRCRAFT 9697 WAS ENROUTE GATWICK TO MARVILLE ON SF90 PD AIRCRAFT PASSED FROM MOSELLE CONTROL TO MARVILLE APPROACH AT 22 MILES AND ALTITUDE 4000 FEET PD GCA GAVE IDENTIFICATION TURN AND SUBSEQUENT APPROACH INSTRUCTIONS PD AIRCRAFT ON STRAIGHT IN APPROACH TO RUNWAY 12 PD APPROACH NORMAL PD AIRCRAFT ON GLIDE PATH AND GIVEN MINOR CORRECTIONS ONLY IN AZIMUTH PD SHORTLY AFTER ONE AND THREE QUARTER MILES FROM TOUCHDOWN AIRCRAFT DISAPPEARED FROM RADAR SCOPE PD CONTROLLER GAVE OVERSHOOT INSTRUCTIONS PD TIME 2056Z PD WEATHER AT BEGINNING OF APPROACH 200 FEET OVERCAST AND 4 MILES VISIBILITY PD DURING APPROACH SPECIAL WEATHER OBSERVATION OF CEILING 150 FEET VISIBILITY 3 MILES PASSED TO PILOT PD GROUND SEARCH INITIATED AT 2100Z AND WRECKAGE LOCATED IN DENSE WOOD AT 2345Z PD DOCTORS ON SCENE REMOVED THREE SURVIVORS IMMEDIATELY AND CASUALTIES REMOVED APPROXIMATELY 0900Z PD SURVEY OF CRASH SCENE SHOWS AIRCRAFT STRUCK TREES AT ONE AND ONE HALF MILES FROM RUNWAY PD PORT STABILIZER AND SUNDRY BITS FELL OFF OVER 200 YARD DISTANCE PD AIRCRAFT SLEWED INTO TREES COMING TO REST OVER A FIFTEEN INCH DIAMETER TREE WHICH CRUSHED FUSELAGE PD PORT ENGINE BURNED BUT NO EXTENSIVE FIRE PD IMPOSSIBLE TO ESTABLISH CAUSE PD INVESTIGATION IN PROGRESS

Drafter's Name : (AF Avant) G/C
(CO)

Releasing Officer's Signature :

(R Lowry) S/L

CERTIFIED TRUE COPY

President - Board of Inquiry

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Appendix "E"
To the Board of Inquiry
Convened at 1 Wing RCAF
MarvilleFrance on
31 Dec 63

PHOTOSTATIC COPY OF FLIGHT PLAN AND F-17

CA48 / R.A.F. F.2919 — FLIGHT PLAN — PILOT'S COPY — Flight Plan No.

PRIORITY INDICATOR | ADDRESSEE(S) INDICATOR(S)

NOTES:- 1. Use BLOCK CAPITALS
2. Pilot to complete sections A to P in all cases

ORIGINATOR INDICATOR
SPECIFIC IDENTIFICATION OF ADDRESSEE(S)

TYPE OF MESSAGE	TYPE OF FLIGHT	AIRCRAFT IDENTIFICATION — RADIO IDENTIFICATION — FLIGHT IDENTIFICATION	TYPE OF AIRCRAFT	TIME OF DEPARTURE PROPOSED	TIME OF DEPARTURE ACTUAL
	A IFR	B CANADIAN 9697	C B170	D 1830Z	

POINT(S) OF DEPARTURE EN ROUTE AND LANDING	TRUE AIRSPEED	CRUISING LEVEL(S)	ESTIMATED ELAPSED TIME	POINT(S) OF DEPARTURE EN ROUTE AND LANDING	TRUE AIRSPEED	CRUISING LEVEL(S)	ESTIMATED ELAPSED TIME	POINT(S) OF DEPARTURE EN ROUTE AND LANDING	TRUE AIRSPEED	CRUISING LEVEL(S)	ESTIMATED ELAPSED TIME
E EGKK	145K	ASC	+06	2 7 OAKS	145K	ASC	+04	3 MALLING	145K	70	0416
4 DVR	145K	70	1100	5 B3 CH	145K	70	+25	6 RIO LFQM			
7				8				9			
10				11				12			
13				14				15			

ALTERNATE AERODROME(S)	TOTAL EET TO FIRST LANDING	FUEL ENDURANCE	OTHER INFORMATION (Military Pilots' Instrument Rating. Rank, name and appointment of any V.I.P. aboard)
F	G [illegible]50	H 5+15	I GREEN

RADIO TRANSMITTING FREQUENCIES	ILS	DECTRA	DECCA	DME	VOR	GEE	LORAN	RAD COMPAS	OTHER	TOTAL No. OF PERSONS ON BOARD	NAME OF PILOT-IN-COMMAND	IDENTITY OF OPERATOR
J RLT VHF/UHF	K 1	2	3	4	5	6	7	8	SIF	L 6 CREW + 3 PAX	M HAMLEN	N RCAF

NOT FOR TRANSMISSION

EMERGENCY AND SURVIVAL EQUIPMENT

FREQUENCY PORTABLE RADIO	TYPE OF EQUIPMENT	LIFE JACKETS	WITH	WITH	RADIO FREQUENCY	DINGHIES	WITH	COLOUR	NUMBER	TOTAL CAPACITY	OTHER EQUIPMENT
O 121.5 243 500 8364	P Polar Desert Maritime Jungle	20 Jackets	Light	Fluorescein	Mc	Dinghies	Cover				

Signature of Pilot or his designated representative: [signature]
Signature of ATS officer: [signature] At: 1750
Handed in for transmission at:

SHEET 3

FLIGHT PLAN GATWICK TO MARVILLE

STATION: 2 WING
UNIT: 109 KU

ROYAL CANADIAN AIR FORCE

DAILY FLYING LOG AND FLIGHT AUTHORIZATION FORM

SERIAL NO. 647
DATE 30 Dec 63

AIRCRAFT TYPE (1)	REG. NO. (2)	CREW NO. RANK NAME DUTY (3)	PASSENGERS NO. RANK NAME STATUS (4)	DUTY TO BE PERFORMED (5)	TIME TO TAKE OFF (6)	DURATION OF FLIGHT (7)	Flight Authorized (Initials) (8)	Flight Acknowledged by Captain (Initials) (9)	UP (10)	DOWN (11)	TOTAL DURATION (12)	SINGLE ENGINED DAY DUAL (13)	SINGLE ENGINED DAY PILOT (14)	SINGLE ENGINED NIGHT DUAL (15)	SINGLE ENGINED NIGHT PILOT (16)	MULTI-ENGINED DAY DUAL (17)	MULTI-ENGINED DAY 1st PILOT (18)	MULTI-ENGINED DAY 2nd PILOT (19)	MULTI-ENGINED NIGHT DUAL (20)	MULTI-ENGINED NIGHT 1st PILOT (21)	MULTI-ENGINED NIGHT 2nd PILOT (22)	INSTRUMENT FLYING SIMULATED (23)	INSTRUMENT FLYING ACTUAL (24)	OCO OR ONCO (25)	CAPTAIN'S SIGNATURE AND RANK (26)
B170	9697	23560 F/L HAMLEN J/K CAPT		SF 89-90			[illegible]	[illegible]																	
		3752 F/L CLOUTIER V 1ST OFF																							
		13005 F/L WALSH E J NAV																							
		207748 LAC CASTLE EM CREW																							
		25318 FS McWILLIAMS JJ TT	FROM LFQM AND RETURN																						
		138267 CPL MURPHY RD TT	FROM LFQM AND RETURN																						
		30490 F/L LAWSON BL RO	FROM LFQM AND RETURN																						
		20037 W/C MIDDLEMISS RE SUP CREW	GATWICK TO LFQM																						

Superseded [illegible]

CHECKED

D—FOR TD, POSTING, TRANSFER, AIR EXPERIENCE FLIGHTS
L—FOR LEAVE, PASS

TOTAL
CERTIFIED CORRECT
OC FLIGHT OR UNIT

DAILY FLYING LOG AND FLIGHT AUTHORIZATION FORM

Appendix "F" to
Board of Inquiry
Convened at 1 Wing RCAF
Marville, France on
30 Dec 63.

TRANSCRIPT OF GCA TAPE RECORDING -
APPROACH OF VC 9697 - 30 DEC 63

CONFIDENTIAL

GCA WHERE IS HE COMING FROM, CHARLEY HOTEL?

TWR CHARLEY HOTEL, YEAH, HOW DO YOU WANT HIM, OVER THE BEACON?

GCA IF I CAN PICK HIM OUT, I CAN DO A STRAIGHT-IN ON HIM.

TWR YEAH, OK.

GCA BUT I HAVEN'T GOT ANYTHING ON HIM YET.

TWR OK ADVISE ME THEN, OTHERWISE WE'LL PUT HIM OVER THE BEACON.

TWR HELLO

GCA IV'E GOT ONE NOW, 17 MILES, WHAT'S HIS ALTITUDE?

TWR HE'S NOT UNDER OUR CONTROL, HE'S DESCENDING TO FOUR THOUGH.

GCA OK, WHEN HE IS UNDER OUR CONTROL, I'LL TAKE HIM.

TWR YEAH, OK.

GCA TELL HIM YO SQUAWK, IS HE SQUAWKING NOW?

TWR NO, HE IS NOT SQUAWKING YET, OK I'LL GET HIM TO SQUAWK, WHAT DO YOU WANT? HIM TO SQUAWK?

GCA 325 NORMAL.

TWR OK I'LL SEND HIM OVER TO YOU, WHAT CHANNEL DO YOU WANT HIM, CHANNEL 10? 299.2?

GCA OK CHANNEL 10.

TWR 9697 IS CLEARED TO THE AIRPORT FOR A RANDOM RADAR APPROACH, RUNWAY 12, ALTIMETER 3032, CONTACT RADAR ON FREQUENCY 299.2, MAINTAINING FOUR THOUSAND.

A/C CLEARED TO THE AIRPORT FOR A RANDOM RADAR APPROACH, RUNWAY 12, MAINTAINING FOUR THOUSAND, CONTACT RADAR ON FREQUENCY 299.2.

A/C MARVILLE GCA, CANADIAN 9697, GOOD EVENING.

GCA 9697, LOUD AND CLEAR, HOW ME?

A/C FIVE BY FIVE.

GCA 9697, PAINTING YOUR SQUAWK 15 MILES TO THE WEST OF THE STATION, TURN LEFT 020 MAINTAIN 4000, OVER.

A/C 9697 LEFT TURN TO 020 MAINTAINING 4

GCA 9697, HAVE YOU IN YOUR TURN, YOU CAN COMMENCE YOUR DESCENT TO 2.5, MAINTAIN HEADING 020, OVER.

A/C 9697 MAINTAINING 020, OUT OF 4 FOR 2.5

GCA ROGER 9697, IF NO TRANSMISSION RECEIVED FOR 1 MINUTE DURING TRAFFIC OR 5 SECONDS ON FINAL, ESTABLISH AN ALTITUDE OF 2.5 ON YOUR LAST ASSIGNED, RE-HOME THE MMY BEACON, CONTACT MARVILLE APPROACH FOR FURTHER, OVER.

A/C 9697, WILCO

GCA 9697, YOU'RE MAKING A RIGHT HAND APPROACH TO RUNWAY 12, 8,000 FEET LONG, 150 FEET WIDE, TOUCHDOWN POINT 100 FEET FROM THE END, OVER.

A/C 9697.

GCA 9697, THERE IS NO CHANGE IN THE WEATHER SINCE GIVEN TO YOU BY THE TOWER, THE ALTIMETER IS 30.32, DO YOU WISH ANY PART OF IT REPEATED?

A/C ROGER, WE CHECK IT'S STILL 200 OVERCAST 4 MILES IN FOG, IS THAT CORRECT?

GCA AFFIRMATIVE.

A/C THANKS MUCH, I ASSUME THE APPROACH LIGHTS ARE ON?

GCA I'LL CHECK WITH TOWER, I THINK THEY ARE.

A/C THANKYOU.

TWR YEAH, THEY'RE ON.

GCA OK THANK YOU.

GCA 9697, YOUR RANGE 14 MILES, CORRECTION 22 MILES TO THE WEST OF THE STATION.

A/C 97

GCA 97, GCA, TURN RIGHT HEADING 090, MAINTAINING 2.5 ON REACHING, OVER.

A/C ROGER, 9697 IS NOW 2500 FEET AND WE'RE TURNING RIGHT TO 090.

GCA (TO TOWER) OK MY SCOPE WAS ON THE 60 MILE AND HE IS 25 MILES OUT.

TWR 25 OUT EH? THAT'S A TERRIBLE THING.

GCA YEAH, I KNOW.

TWR OK.

GCA 9697, I READ THE SCOPE WRONG, I WAS ON THE 60 MILE RANGE YOUR RANGE IS 24 MILES TO THE WEST OF THE STATION NOW.

A/C OK, I WOULD LIKE YOU TO CHECK THAT, OUR ESTIMATE IS FIVE ZERO, THAT SHOULD PUT US AT ABOUT OH -- 15 AT THE MOST.

GCA 96, I AM ON THE 30 MILE RANGE NOW, THE RANGE IS 22 MILES AT THIS TIME.

A/C OK WE CHECK.

GCA 9697 GCA, YOUR CONTROLLER ON TRAFFIC AND FINAL WILL BE NUMBER 14, HOLDING STATION LIMITS, OVER.

A/C 697 CHECKS.

GCA 97 GCA, YOUR RANGE IS NOW 17 MILES TO THE WEST OF THE STATION, TRACKING IN NICELY TO THE ON COURSE.

A/C 97

GCA 97, CONFIRM FULL STOP LANDING, REQUEST SPEED ON FINAL.

A/C 9697 WILL MAKE A FULL STOP AND 100 KNOTS ON FINAL.

GCA GCA.

TWR YEAH, MET JUST TAKEN A CHECK, CEILING MEASURED 150 OVERCAST, 3 MILES IN FOG.

GCA RICHTO, THANKYOU

TWR OK.

GCA 97 GCA, TOWER JUST REPORTED THE WEATHER NOW 150 OVERCAST, THREE MILES IN FOG.

A /C 97

GCA 97, YOUR RANGE NOW 14 MILES PERFORM YOUR COCKPIT CHECK ADVISE.

A/C 97

GCA 97 ✗ TURN RIGHT HEADING 110 MAINTAINING 2.5, OVER

A/C ROGER, 97 RIGHT 110 MAINTAINING 2.5.

A/C GCA, 9697.

GCA 97, GO AHEAD.

A/C OK, IN CASE WE DON'T MAKE THIS, WONDER IF YOU HAVE THE 2 WING WEATHER HANDY AND MAYBE PHONE MET AND GET US AN ALTERNATE.

GCA ROGER, WE WILL HAVE THE TOWER DO THAT - CHECK WHAT POWER?

TWR OK

GCA 97, NOW RIGHT TO 115, NOW.

A/C 97, ROGER 115.

GCA 97, YOU ARE ON FINAL NOW, THIS IS YOUR FINAL CONTROLLER, HOW DO YOU READ?

A/C 5 x 5.

GCA ROGER 97, YOU NEED NOT ACKNOWLEDGE FURTHER TRANSMISSIONS UNLESS REQUESTED TO DO SO, 9 MILES FROM TOUCHDOWN. YOUR ALTITUDE NO THE 2.5, 115 YOUR HEADING CORRECTING TO THE ON COURSE SIGNAL, NOW GO RIGHT HEADING 120, 120 YOUR HEADING, JUST FAVOURING SLIGHTLY THE RIGHT HAND SIDE, CORRECTING OVER VERY NICELY, ALTITUDE 2.5, YOU'RE ON COURSE THIS TIME, 120 YOUR HEADING 120, HOLDING VERY NICELY TO THE ON COURSE, 7½ MILES FROM TOUCHDOWN, RIGHT FOUR DEGREES TO 12 , 12 YOUR NEW HEADING, PICKING UP A LITTLE DRIFT, GOING TO THE LEFT, COMING BACK, ONE MILE FROM THE GLIDE PATH, 124 IS YOUR HEADING, FURTHER RIGHT HEADING 120, 128 PICKING UP A DRIFT, GOING TO THE LEFT, 120 YOUR HEADING, ALTITUDE 2.5, 128 YOUR HEADING, GOING TO THE LEFT OF THE ON COURSE, 120 BRINGING YOU BACK SLOWLY NOW, 120 YOU'RE SEVEN MILES FROM TOUCHDOWN, 128 YOUR HEADING, INTERCEPTING GLIDE PATH AT THIS TIME, commence YOUR DESCENT NOW AT 500 FEET PER MINUTE, 500 FEET PER MINUTE YOUR RATE OF DESCENT, 128 IS YOUR HEADING, HOLDING YOU LEFT OF THE ON COURSE, BRINGING YOU BACK SLOWLY, 128, GO RIGHT

4 DEGREES TO 132, 132 at 6 MILES FROM TOUCHDOWN, 132 YOUR HEADING, COMING BACK SLOWLY, 6 MILES FROM TOUCHDOWN, YOU'RE ON THE GLIDE PATH, A GOOD RATE OF DESCENT, 132 IS YOUR HEADING, STILL HOLDING LEFT OF THE ON COURSE, COMING OVER VERY NICELY NOW, 132, 5½ MILES FROM TOUCHDOWN, YOU ARE ON THE GLIDE PATH, COMING OVER TO THE ON COURSE FROM THE LEFT HAND SIDE VERY NICELY, 132 IS YOUR HEADING, TRACKING OVER VERY NICELY, ON THE GLIDE PATH, A GOOD RATE OF DESCENT SO FAR ALL THE WAY IN, 132 IS YOUR HEADING, BRINGING YOU OVER VERY NICELY NOW, MAINTAIN YOUR HEADING 132, WIND REPORTED AT THE SOUTH AT 5 MILES PER HOUR, 132 IS YOUR HEADING, 4½ MILES FROM TOUCHDOWN, YOU ARE ON THE GLIDE PATH, COMING OVER TO THE ON COURSE VERY NICELY, 132 IS YOUR HEADING, 4¼ MILES, 4¼ MILES, COMING OVER VERY NICELY, 132 IS YOUR HEADING, LEFT 2 DEGREES TO 130, 130, 3⅝ MILES, NICE RATE OF DESCENT SO FAR ALL THE WAY IN, YOU ARE ON THE GLIDE PATH 130, COMING UP TO THE ON COURSE VERY NICELY NOW, 130 IS YOUR HEADING, HOLDING JUST SLIGHTLY LEFT NOW, 130 IS YOUR HEADING, 3½ MILES, YOU'RE ON THE GLIDE PATH, AN EXCELLENT RATE OF DESCENT, 130 YOUR HEADING, COMING OVER TO THE ON COURSE, STILL HOLDING A SHADE TO THE LEFT, 130, 2¾ MILES FROM TOUCHDOWN, 130 YOUR HEADING, STILL HOLDING LEFT TO BRING YOU OVER SLOWLY, 130, 2½ MILES, YOU ARE ON THE GLIDE PATH, EXCELLENT RATE OF DESCENT ALL THE WAY IN.

GCA (TO TWR) 2¼ NOW.

GCA (CONTINUING TO A/C) CLEARED FULL STOP LANDING, CHECK YOUR GEAR DOWN, 2¼ MILES, 130 IS YOUR HEADING, HOLDING ON GLIDE PATH, COMING OVER TO THE ON COURSE FROM THE LEFT HAND SIDE, 130 IS YOUR HEADING, COMING OVER SLOWLY BUT NICELY, 130 STILL HOLDING LEFT 1¾ MILES FROM TOUCHDOWN, 130 IS YOUR HEADING, STILL COMING OVER TO THE ON COURSE ON THE LEFT HAND SIDE, 130, COMING OVER SLOWLY BUT NICELY, 130 STILL HOLDING LEFT, 1¾ MILES FROM TOUCHDOWN, 130 IS YOUR HEADING, BRINGING YOU OVER SLOWLY, 130, 130, GCA JUST LOST YOU ON PRECISION, THE PRECISION WENT, GCA JUST LOST YOU, CARRY OUR OUT YOUR MISSED APPROACH, CARRY OUT YOUR MISSED APPROACH, GCA STANDING BY.

GCA I JUST LOST HIM ON PRECISION, TOWER,

TWR SAY AGAIN.

GCA I JUST LOST HIM ON PRECISION, IT WENT.

TWR YOU'RE STILL TALKING TO THE AIRCRAFT?

GCA I JUST GAVE HIM OVERSHOOT, STANDBY.

GCA 9697, GCA DID YOU CARRY OUT YOUR MISSED APPROACH, OVER.

GCA 9697, GCA, DO YOU READ?

TWR DO YOU SEE ANYTHING ON AH----

GCA HAVEN'T GOT A DAMN THING TOWER.

TWR WHAT DO YOU FIGURE HAPPENED?

GCA AT 3½ MILES I LOST HIM, AT 2½ RATHER, AT 2½ MILES I LOST HIM.

GCA 9697, 9697, GCA, DO YOU READ?

GCA HAVE YOU GOT HIM TOWER?

TWR NEGATIVE.

GCA OH CHRIST!

GCA 9697, GCA, 9697, GCA, DO YOU READ?

TWR DO YOU HAVE HIM ON SURVEILLANCE AT ALL (PAUSE) DO YOU HAVE HIM ON SURVEILLANCE AT ALL?

GCA 9697, GCA, DO YOU READ?

GCA GO AHEAD TOWER.

TWR ANYTHING ON SURVEILLANCE AT ALL?

GCA NOT A DAMN THING.

TWR NOT A THING EH?

GCA NO.

TWR OK.

--- HOLY CHRIST, WHERE IS HE GONE?

TWR WE HAVE MOSELLE ON HIM NOW.

GCA GO AHEAD TOWER.

TWR YOU NEVER SAW HIM ON SURVEILLANCE AT ALL?

GCA NO, I'VE NOT SEEN A THING ON SURVEILLANCE.

TWR WHAT HAPPENED OUT THERE?

GCA AT 2½ MILES I LOST HIM, HE JUST DISAPPEARED OFF THE PRECISION SCOPE.

TWR OK, WE ARE GOING TO TREAT THIS AS AN OFF STATION CRASH AT 2½ MILES, OK?

GCA RIGHTO.

TWR OK.

TWR GO AHEAD.

TWR (REPEATS) GO AHEAD.

GCA ANYTHING SIR? DO YOU HAVE ANYTHING ON HIM?

TWR NOTHING AT ALL.

GCA YEAH, I'M GOING IN THERE AND GET THE PRECISION BACK ON THE AIR AGAIN.

- END -

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Appendix "G"
to the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

PHOTOSTATIC COPIES OF PILOTS' LOG BOOKS

Month	Date	Aircraft Type	Aircraft No.	Pilot, or 1st Pilot	2nd Pilot, Pupil or Passenger	Duty (Including Results and Remarks)	Single-Engine Day Dual (1)	Single-Engine Day Pilot (2)	Single-Engine Night Dual (3)	Single-Engine Night Pilot (4)	Multi-Engine Day Dual (5)	Multi-Engine Day 1st Pilot (6)	Multi-Engine Day 2nd Pilot (7)	Multi-Engine Night Dual (8)	Multi-Engine Night 1st Pilot (9)	Multi-Engine Night 2nd Pilot (10)	Passenger (11)	Instr/Cloud Flying Dual (12)	Instr/Cloud Flying Pilot (13)	Link Trainer (14)
YEAR 1963		—	—	—	—	— Totals Brought Forward	243/05	1078/45	13/00	66/15	131/10	2016/.00	198/55	11/30	227/05	19/10		219/50	183/15	
Nov	4	B170	9698	F/L STAMMET	SELF	AIR TEST						45								
	5	"	"	F/L NELSON	"	DF 89/90 - 2W-1W-GAF-1W-2W						600			45				100	
	8	"	9699	F/L BIDEWELL	"	AF707 " " " " "						550							100	
	13	"	9698	F/L SOUCALE	"	SF 83 2W-1W-DECI-PISA						930							100	
	15	"	"	"	"	SF 86 - PISA DECI						210								
	16	"	"	"	"	SF 86 DECI-1W-2W (ATT)						520			45					
	19		9699	SELF	F/L BIDEWELL	SF 89 - 2W-1W						100								
	20	"	"	"	"	SF 90 1W-GAF-1W-2W						535			100				100	
	26	"	"	"	F/L ELLIOTT	SF 87 2W-1W-DECI						630								
	27	"	"	"	"	SF 88 DECI-1W						630								
	29					SF 89/90 1W-GAF-1W-2W						430			55					
CERTIFIED CORRECT				B170	- 58 25	MONTHLY 58 25	-	-	-	-	-	55 00	-	-	3 25	-	-	-	4 00	-
				C47	-															
O.C. 109 Comm. Flt.						GRAND 4059 20	243 05	1078 45	13 00	66 15	131 10	2067 00	198 55	11 30	230 30	19 10		210 50	187 15	
Dec	2	B170	9700	F/L BIDEWELL	SELF	AF724 2W-GAF-4W-2W						650			100					
	4	C47	441	F/L LEVITT	"	2W-1W-3W-4W-2W						430							30	
	11	C47	665	F/L DICKSON	"	SF101 2W-1W-3W-4W-2W						340							30	

GRAND TOTAL [Cols. (1) to (10)] ______ Hrs. ______ Mins. TOTALS CARRIED FORWARD

F/L HAMLEN (CAPTAIN)

Month	Date	Aircraft Type	Aircraft No.	Pilot, or 1st Pilot	2nd Pilot, Pupil or Passenger	Duty (Including Results and Remarks)	Single-Engine Day Dual (1)	Single-Engine Day Pilot (2)	Single-Engine Night Dual (3)	Single-Engine Night Pilot (4)	Multi-Engine Day Dual (5)	Multi-Engine Day 1st Pilot (6)	Multi-Engine Day 2nd Pilot (7)	Multi-Engine Night Dual (8)	Multi-Engine Night 1st Pilot (9)	Multi-Engine Night 2nd Pilot (10)	Passenger (11)	Instr/Cloud Flying Dual (12)	Instr/Cloud Flying Pilot (13)	Link Trainer (14)
YEAR 1963	—	—	—	—	—	— Totals Brought Forward	61:35	766:55	9:25	27:25	236:40	3746:20	586:40	519:55	47:35	47.35	617:05	145 15	555:25	109:50
Nov	21	B-170	9699	Self	F/L Stemmer	Deci - Soellingen						1:05			4:30					
"	"	"	"	"	" "	Soellingen - Gros Tenquin									1:00					
"	27	"	9700	"	" "	Gros Tenquin - Marville						:40								
"	28	"	"	"	" "	Marville - Deci						4:50								
"	"	"	"	"	" "	Deci - Pisa						3:00								
"	29	"	"	"	" "	Pisa - Deci						2:15								
"	30	"	"	"	" "	Deci - Marville						5:00								
"	"	"	"	"	" "	Marville - Zweibrucken						1:10								
Dec	1	B-170	9700	Self	F/L Stemmer	Zweibrucken - Gros Tenquin						:35								
"	14	"	"	"	F/L Elliott	Gros Tenquin - Marville						1:00								
"	"	"	"	"	" "	Marville - Deci						4:25								
"	"	"	"	"	" "	Deci - Marville						1:35			3:55					
"	"	"	"	"	" "	Marville - Gros Tenquin									:50					
"	13	"	9698	"	" "	Air Test						:30								
"	23	"	9700	"	Hill	Gros Tenquin return Engine failure						:30								

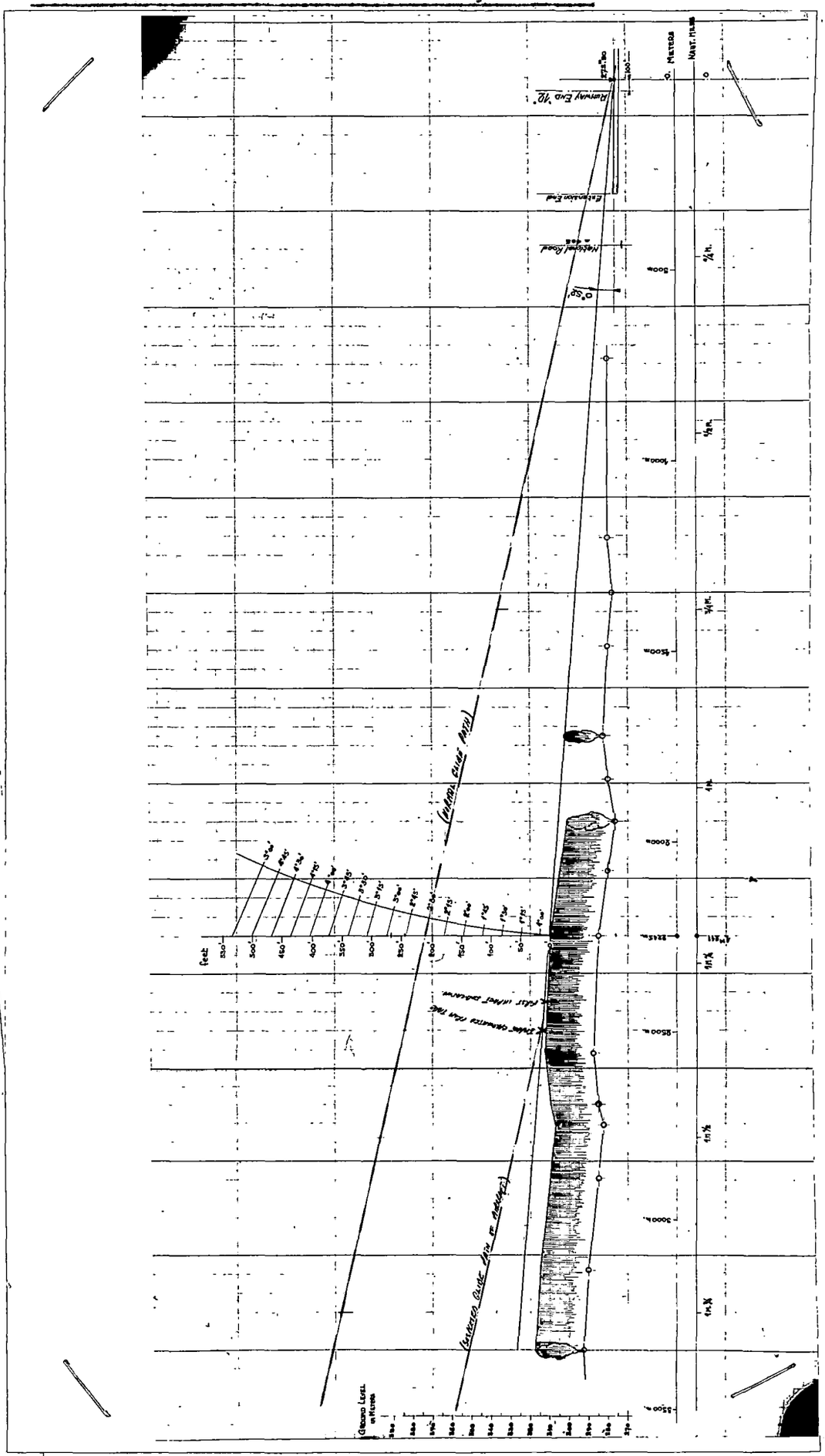
GRAND TOTAL [Cols. (1) to (10)] ______ Hrs. ______ Mins. TOTALS CARRIED FORWARD

F/L CLOUTHIER (1st OFFICER)

CONFIDENTIAL

Appendix "H"
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

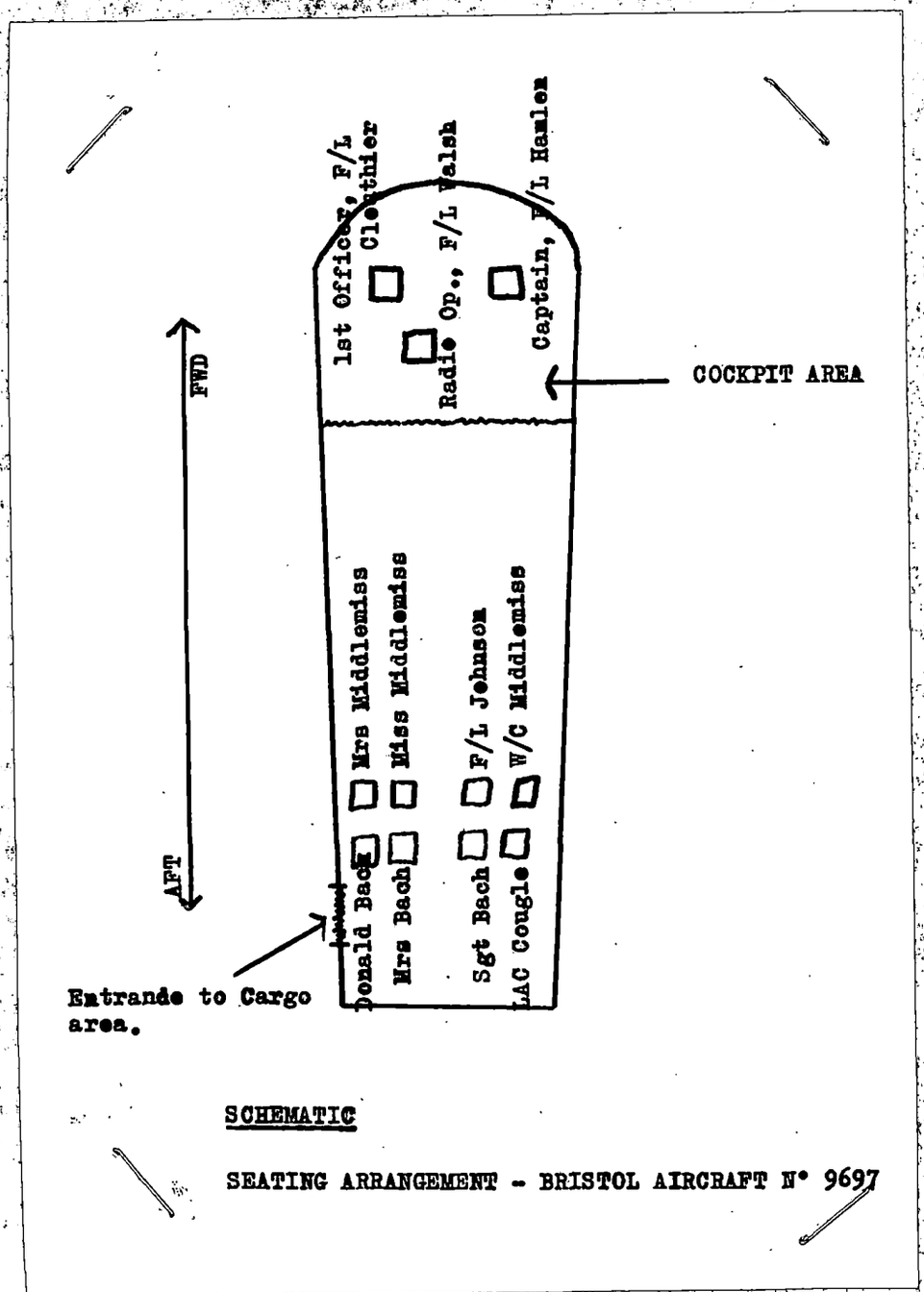
SCHEMATIC OF GCA GLIDE PATH RUNWAY 12, MARVILLE



CONFIDENTIAL

Appendix "J"
To the Board of Inquiry
Convened at 1 Wing RCAF
Marville France on
31 Dec 63

SCHEMATIC OF SEATING ARRANGEMENT, CREW AND PASSENGERS



SCHEMATIC

SEATING ARRANGEMENT - BRISTOL AIRCRAFT N° 9697

CO's Remarks (CO 1 Wing - Command of Occurrence).

This Board of Inquiry has been carefully reviewed. The following remarks will be in three parts - the first part discussing the Board's Findings, the second part discussing the Board's Recommendations, the third part discussing corrective and disciplinary action, to which general observations will be added.

Part I - The Commanding Officer 1 Wing disagrees with Findings (a) and (b) of the Board. In his view the primary cause of the accident was Material - (faulty material). (This is using the Cause Factor Code at Appendix "C" to AFAO 21.56/01). The reason for this conclusion is that it is believed that a faulty GCA set is the root cause, the basic underlying factor in this tragic sequence of events. If the operator, Cpl Frye, had been operating completely serviceable equipment, properly tuned up, no accident would have occurred. Cpl Frye was conscientiously doing his job; were his equipment functioning properly, he would have not had a spurious radar return to mislead him. In this respect the evidence of the ninth witness is relevant, on page 27 in the fourth paragraph of his statement he states : "the gain was adjusted so that the aircraft return was as small as possible ..... even under these conditions the target would extend upwards..... the use of a little more gain .....made the upper target extension a part of the aircraft return as it was as strong and sometimes stronger than the main aircraft return." In these circumstances, the primary cause cannot be attributed to the operator of the GCA set, but must rest with the equipment he was operating.

The Commanding Officer 1 Wing gives as contributing causes :

(i) Ground - Flying Control - poor technique by GCA operator;

(ii) Aircrew - Carelessness;

(iii) Briefing - Supervision - RCAF Orders inadequate (not necessarily in that order of importance).

The Board has discussed these aspects at some length, and, in the main, no disagreement can be found with their observations. With respect to the aircrew it is hard to reconcile that both pilots would allow the aircraft to proceed below established minimums especially at 1½ - 2 miles from touchdown. This is perhaps the key part of the approach sequence ; aircrew must not go below minimums. To do so at 1½ - 2 miles on the approach is to court disaster.

The Commanding Officer 1 Wing agrees with Findings (c) to (w) inclusive. Finding (c) is interpreted to preclude flying discipline as such but to refer to authorization formalities. Finding (v) might use the permissive "may" rather than "will". The Commanding Officer 2 Wing can comment with more authority on Finding (t).

Part II - The Commanding Officer 1 Wing concurs in Recommendation (a). With respect to Recommendation (b) while concurring in this statement, further amplification should be given. [redacted] as a controller, has no doubt developed poor operating techniques. These have not come to notice owing in part to the shortcomings of the procedures and regulations set out in CAP 342. With training and supervision FS Martynuk could easily requalify as a controller; with supervision he could continue to control. As a supervisor, and as a senior NCO it is recommended that he be reverted in rank to a Sergeant, a rank for which his supervisory abilities more closely qualify him. This is likely his plateau as an NCO.

Recommendation (c) is concurred in. Various components including a new precision elevation antenna have been installed, adjustments have been made and the complete unit has been thoroughly checked. During this work, one undesirable characteristic was eliminated. Specifically, the tendency for the top lobe to remain, when gain was reduced, at which time the lower lobe disappeared, has now no longer exists. Rather, both top and lower lobe (is part of the overall radar return) diminished equally with lowering of gain, as they should. The technical staff still claim that the overall size of the radar return at maximum gain is abnormally large and are continuing investigations into this phenomenon. The operating staffs are satisfied however, that the radar return is manageable in all respects, and are prepared to accept this abnormality. In passing it can be stated that a large radar return is usually a desirable characteristic.

Recommendation (d), (e) and (f) are concurred in. Recommendation (g) in principle but a time lapse of 15 days is suggested as more practical. On occasion weather itself and operational requirements can preclude the practicability of a seven day period. Recommendation (h) is supported only if Recommendation (e) is not accepted. A station Chief Controller (GCA) should check operators on his station, much as a unit instrument check pilot gives proficiency checks to pilots for their instrument flying. No comment is warranted on Recommendation (j).

Recommendation (k) is not endorsed. Controllers are trained initially in stages now. A controller who does not qualify to station limits is not employable without supervision, therefore, intermediate limits are valueless. Recommendation (l) part (i) is not concurred in; pilot's flying accuracy at this range is not usually accurate enough to warrant this step. Part (ii) is endorsed; this is an excellent recommendation. Recommendation (m) is concurred in; Commanding Officer 2 Wing will no doubt comment further. Pilots should be aware of the range-altitude relationship, ie, the approach distance at which minimum altitude should be reached. There is no comment on Recommmndation (n). Recommendation (o) is concurred in, this is being done.

Part III - The following corrective action or disciplinary action is being done or is contemplated. Referring to Recommendation (a), [redacted]'s qualification has been withdrawn. He is receiving further training. His transfer to another unit must await 1 Air Division authority. No disciplinary action against him is proposed or recommended. Referring to Recommendation (b), [redacted] has been removed from his supervisory duties, his controlling qualification has been withdrawn; he is receiving further training. It is recommended that he revert to Sergeant rank. This and his transfer await 1 Air Division action. Recommendation (c) is covered in Part II. Recommendations (d), (e) and (f) await policy decision. Respecting Recommendation (g) this wing has introduced a mandatory check after 15 days absence from controlling. See remarks in Part II on Recommendation (h); this wing has appointed a senior NCO as a standards supervisor who is examining all controllers. An outside controller will be asked to check him. There is no comment or no further comment on recommendations (j), (k), L (l), (m), (n) and (o). With respect to recommendation l(ii) this has been incorporated in this unit's GCA procedure.

General - The Commanding Officer 1 Wing is pleased with the thoroughness of the Board's investigation. It is felt that the sequence of events of the accident has been accurately described.

The Board has gone to some lengths to set out shortcomings in CAP 342; while these may exist, they cannot excuse the omissions of responsible officers and NCOs who are charged with the execution of certain operations.

The Board was critical of the RAPCON organization; the harshness of this criticism is not felt to be warranted by station authorities, who, in the course of their duties, enquire into these affairs every week of the year. They feel that the disruption of work procedures by the Board members and maintenance technicians in a so confined space may, in part, have created this impression.

It will be recalled that [redacted]'s predecessor was removed for incompetence. [redacted] has been at the unit about one year; his shortcomings are recognized and are a matter of record.

It is pertinent to note that no specific criteria exist that describe a serviceable operating CCA set. Whereas each operator accepts or rejects his set when he comes on duty, as with most equipments, it is a matter of individual judgement in each case to determine if a specific machine is performing properly. This is a function of training; experience and supervision. CCA sets have been modified over the years; each seems to be taken at face value with its individual idiosyncracies. Some of these are tolerated; most are accepted. In this case an idiosyncracy developed into a dangerous condition wherein a relatively inexperienced operator was unknowingly able to falsely interpret his radar presentation. This has been rectified. Constant supervision will be exercised to ensure that it is not repeated.

If a Command CCA Check Controller is established, one of his functions might well be to compare CCA units at different stations to bring to attention significant differences in presentation between sets.

(AP Avent) C/C
CO 1 Wing RCAF

CO's Remarks (CO 2 Wing - Command of Ownership)

Re Findings

Re Findings (a) and (b) - I have less argument with the Board's findings (a) and (b) than does the CO 1 Wing. I share what I believe to be his concern for the impact on [redacted] of whatever cause appraisal is approved. Notwithstanding this, when one takes into account the fact that the judgment concerning the adequacy of the equipment was an integral part of the decision to control the aircraft, then I am forced to the conclusion that Ground Flying Control, must be the primary cause, if I am restricted to the format set out in AFAO 21.56/CL (App C). It can be argued, however, that [redacted] was the victim of a set of circumstances in which he failed because of reasons which were beyond his control. I agree absolutely with the CO 1 Wing's decision that no disciplinary action should be considered against the Corporal.

A case can be made to say that each of the related causes requires equal attention as far as corrective action is concerned. Therefore I would prefer to deviate from the format restriction imposed by AFAO 21.56/CL (App C) and state the primary cause to be - Misinterpretation of the height display on the GCA radar.

Contributing causes which require corrective action can then be considered to be:

(a) Material - the peculiarity of the radar display of elevation created a condition conducive to misinterpretation.

(b) Ground -

(1) Poor operating techniques on the GCA Controller's part enhanced the possibility of a false interpretation of height information.

(2) The identical shortcomings in operating technique exhibited by the chief controller (GCA) whose responsibility it was to train and supervise the radar control staff.

(c) Briefing - Administration. The inadequate administrative system which permitted the situation in (b) to exist. (As the Board points out it is entirely possible that similar situations exist elsewhere).

(d) Aircrew - Training and operating techniques. There is no formalized method whereby the Captain of the aircraft cross-checks the validity of the GCA Controller's statement that the aircraft is on glidepath.

Re Findings (e) to (s) inclusive - I agree.

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Re Finding (t) - There is no doubt in my mind that the co-pilots in 109 SU are in the habit of specifically monitoring the minimum altitude permitted on a IFR approach. There is, however, no standard procedure for communicating this information to the Captain. (I have reached this opinion through a written questionnaire and from individual discussion.) In addition, however, I believe it is true to say of most 109 pilots, and of many other pilots, that there is no systematic thought process in effect to monitor altitude versus range to the end of the runway, for the purpose of checking the validity of the controller's statement that the aircraft is on glidepath. Having talked to a cross-section of pilots and taking my own behavior into account, I believe that most pilots have been inclined to accept without question the Controller's statement concerning vertical elevation in respect to the glidepath.

In this instance the Captain could be given the benefit of doubt:

(a) that he intended to overshoot upon reaching minimum altitude despite having received a measured ceiling report of 150' (50' below minimum), and

(b) that his altimeter was not reading below minimum approach altitude at first impact, considering pressure changes and possible altimeter error.

Accepting the above, a technique which would permit minimum altitude to be reached at 1 3/4 miles from the runway (notwithstanding the GCA controller's assurance that he was on glidepath) is not acceptable.

Re Finding (u) - Concur, although there is no connection with the accident.

Re Finding (v) - For "will" read "may".

Re Finding (w) - Concur

Re Recommendations

Re Recommendation (a) - I do not believe it is wise to have [redacted] continue to be employed as a GCA Controller regardless of how much training and/or experience he acquires. The psychological effect of this experience may bother this man throughout his lifetime. I would fear that because of this experience, if he had to handle an aircraft in difficulty in a minimum weather situation, he might fail to perform effectively.

Re Recommendation (b) - I concur in general with the remarks of the Board, but would raise an additional related observation: it is the belief of my Air Traffic Control staff that there are controllers whose all round capability does not justify their ever assuming supervisory status. In such cases it is believed that after a certain number of years they should be permanently removed from GCA controlling and should be employed in some other part of Air Traffic Control or Search & Rescue. It is thought that such action is feasible on an airforce wide basis without necessarily creating a split in the Air Traffic Control trade structure.

From discussing this aspect of administration with my ATC Staff, I conclude that at present we are employing some "old timers", whose alertness and enthusiasm has depreciated as subordinate controllers. Some of these controllers are Senior NCOs and to employ them in non-supervisory positions necessitates deviation from normal recognition of seniority. Such a deviation from seniority can be expected to aggrevate the probability of substandard performance over a period of time.

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It is strongly recommended that a review be made, on an airforce wide basis, with the object of removing NCOs in this category from GCA Controller responsibilities.

Re Recommendation (c) - I agree with the idea expressed by the CO 1 Wing in the last paragraph on page 99.

Re Recommendation (d) - I do not agree. I believe that such a policy would unduly restrict selection of chief controller (RAPCON) and that it could create a situation where "a little knowledge is a dangerous thing." In this recommendation and also in recommendations (e) to (h) inclusive, the Board is searching for a method to ensure that our operating technique is, in every case, of a superior standard. Certainly the Unit organization itself must always carry the complete responsibility for training and supervision, but the principle that spot-checks on quality control should be carried out by an agent who is independent of unit responsibilities for training and supervision is, in my opinion, an important one.

To give the Chief GCA Controller the final responsibility for checking on the operating competence of his subordinate controllers would not in my opinion be a parallel to our Unit Instrument Check pilot concept. In most cases the Unit Instrument Check Pilot is not himself responsible for training and supervising, whereas the Senior GCA Controller unquestionably is.

Therefore I favour a method whereby a Headquarters agency or a specifically appointed Senior Controller (or Controllers) from another Unit, carry out proficiency checks on all GCA Controllers at least annually. This would not rule out a system of periodic internal checks. An improved system could call for a combination of both internal and external quality control. In my opinion these checks should be conducted not only from the aircraft but also at the Radar Site. The latter will permit a check on the performance of the equipment in addition to the techniques employed by the operator.

I believe that the whole matter of proficiency checks and qualifications for various levels of responsibility in the Radar Control organization merits a special independent study. I would be pleased to have some staff from this Unit participate in such a study.

Re Recommendation (g) - I share the opinion of the CO 1 Wing that two weeks is a more practicable minimum.

Re Recommendation (i) - Concur

Re Recommendation (k) - My Air Traffic Control Staff consider this to be an impractical recommendation. It is, however, agreed that once a controller has his qualification of station limits, that our administration must provide for a continued period of employment under a more experienced controller. It is also believed that there should be definite restrictions in terms of minimum experience, and possibly joint agreement by Unit supervisory staff and the independent check authority before a controller is permitted to be employed as a shift supervisor.

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Re Recommendation (l) - It is my belief that there is an almost universal trust by aircrew in the controller's assurance that an aircraft is on the glidepath in the vertical plane. Logic requires that this information should be double checked. I endorse the principle in (l) (ii) although taking faster aircraft into account, 4 miles might be preferable to 3 miles.

We have considered the practicability of the controller giving the pilot computed height information at each mile interval during the last 5 miles of a GCA approach. Our conclusion is that it is impracticable to require this information more than once. We therefore support the logic of recommendation (l) (ii). In addition however, it is considered desirable to have a section in an official publication, probably CAP 100, which would depict graphically the altimeter heights (above aerodrome level) which equate with 1 mile intervals from the end of the runway. In a multi-engine aircraft there is certainly time for a co-pilot to monitor such a computation. Even for single engine aircraft a question on flight procedure examinations on this subject would stimulate a very desirable thought process.

Re Recommendation (m) - A SOP is being developed.

Re Recommendation (n) - Done.

Re Recommendation (o) - Concur. The results of this study should be universally applied. The situation at 2 Wing is equally deficient.

GENERAL

The Board is to be commended on the quality of this report.

(ER Johnston) G/C
CO 2 Wing RCAF

10 Signature of President of Board (GOB Thrip) W/C

Signature of Member of Board (SE Mayer) F/L

" " " " " (GJ McDowell) F/O

" " " " " (JAOA Savoie) F/L

" " " " " (GOH Poulsen) F/L

Attach CO's Remarks Here:

12 Attach GpCdr's and/or AOC's Remarks Here:

INSTRUCTIONS

Use of Form D6

1. Form D6 has been designed to become the cover for the entire proceedings of a board of inquiry into an aircraft accident or incident.

2. All sections of the form are to be completed.

3. In all cases the first page of the proceedings is to be an index, by page number, of the evidence of witnesses and the exhibits included within the proceedings.

4. Pages are to be numbered consecutively from front to rear. Exhibits are to be lettered in the same manner.

5. Members of the board are to take particular care that the identification and status of all casualties is recorded as required by AFAO 55.00/04.

6. Each witness must sign each page of the evidence upon which his own evidence is recorded.

7. The Board is to insert a "Statement" immediately following the evidence of the last witness in which the evidence of witnesses is correlated with information gathered by the board from visits to the scene of the accident and examination of maintenance documents. This statement should show the processes by which the board reconstructs the evidence and other related factors to produce the findings.

8. The findings (including an opinion as to the cause of the accident, the degree of responsibility and any recommendations) must be based upon and supported entirely by the recorded evidence of the witnesses or by additional facts ascertained by the board itself which must be recorded in the "Statement" section of the proceedings.

9. The Findings of the Board are to be inserted in the proceedings immediately following the Statement of the Board.

10. All members of the board will sign on the final page upon which the findings appear above their typed designation.

11. The Recommendations of the Board, if required by the convening authority, are to be included in the proceedings immediately after the Findings.