

National Transportation Safety Board

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COCKPIT VOICE RECORDER

Group Chair's Factual Report

June 12, 2024

WARNING

The reader of this report is cautioned that the summary and transcript of a cockpit voice recorder audio recording is not a precise science but is the best product possible from a National Transportation Safety Board group investigative effort. The summary and transcript or parts thereof, if taken out of context, could be misleading. The summary and transcript should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the summary and transcript as the sole source of information.

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A. ACCIDENT

Location: Hot Springs, Virginia
Date: March 10, 2024
Time: 1452 eastern daylight time
Airplane: Israel Aircraft Industries 1125 Westwind Astra, N1125A

B. COCKPIT VOICE RECORDER GROUP

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C. FEDERAL CARRIAGE REQUIREMENTS

The event aircraft, N1125A, was operating as Title 14 *Code of Federal Regulations* (CFR) Part 91. The event aircraft was manufactured in 1990 and was

operating such that it was required to be equipped with a cockpit voice recorder (CVR) that records a minimum of the last 30 minutes of aircraft operation.

D. DETAILS OF THE INVESTIGATION

A CVR group was convened on April 17, 2024. The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model:	Fairchild A-100A
Part Number:	A100A
Recorder Serial Number:	59001

1.0 Recorder Description

This model CVR, the Fairchild A-100A records a minimum of 30 minutes of analog audio on a continuous loop tape in a four-channel format: one channel for each flight crew, one channel for a cockpit observer, and one channel for the cockpit area microphone (CAM).

1.1 Recorder Damage

Upon arrival at the laboratory, it was evident that the exterior of the CVR had sustained some heat and structural damage as shown in figure 1. The outer case was removed, and the interior crash-protected case protecting the tape mechanism did not appear to have any heat or structural damage. The magnetic tape was retrieved from within the crash-protected case and was successfully read out using NTSB laboratory equipment.



Figure 1. Damaged exterior of CVR.

1.2 Audio Recording Description

Each channel’s audio quality is indicated in Table 1.¹ Channel number four did not contain any audio information (nor was it required by federal regulations).

Table 1: Audio Quality

Channel Number	Content/Source	Quality	Duration
1	First Officer	Excellent	30 minutes
2	Cockpit Area Microphone (CAM)	Excellent	30 minutes
3	Captain	Excellent	30 minutes
4	None	N/A	30 minutes

1.3 Timing and Correlation

Timing on the transcript was established by correlating the local time of the accident to the corresponding CVR event. The CVR events were offset to reflect the local eastern daylight time of the accident.

Timing on the partial transcript was established by correlating the air traffic control recording transmission time to the corresponding CVR event. Specifically, the CVR time of the final radio transmission from N1125A was linked to the corresponding ATC local time, and all CVR events were offset to reflect the local eastern daylight time of the accident.

¹ Appendix A comprises the CVR Quality Rating Scale.

1.4 Description of Audio Events

The recording began at 14:22:21 with the aircraft in a descent. The captain was the pilot flying and the first officer (FO) was the pilot monitoring and conducted all radio calls. The FO remarked on the need to be careful due to the terrain in the area. The captain remarked that they would be OK because they were flying under visual flight rules (VFR).

At 14:28:22 the crew received and confirmed air traffic control instructions to descend and maintain 17,000 feet. The controller reported the local Roanoke altimeter setting was 29.81 inches of mercury, which was read back by the first officer.

At 14:29:30 the crew tuned the radio to receive the Automated Weather Observation System (AWOS) information for Ingalls Field. The AWOS reported a current time of 1829Z, winds from 290 degrees at 19 knots, visibility and ceiling missing, temperature minus 2 degrees Celsius, dewpoint minus 9 degrees Celsius, and altimeter setting of 29.66 inches of mercury. The first officer remarked that the wind speed had gone down.

At 14:31:50 the crew received and confirmed air traffic control instructions to descend and maintain 11,000 feet. The controller reported the local Roanoke altimeter setting was 29.81 inches of mercury, which was read back by the first officer.

At 14:32:22 the crew requested the ILS approach to runway 25 at Hot Springs airport. Air traffic control provided a clearance direct to waypoint AHLER.

At 14:33:30 a partial AWOS transmission was audible reporting an altimeter setting of 29.65 inches of mercury.

The transcript began at 14:38:33 and follows in Appendix A. The recording ended at 14:52:21.

Submitted by:

Charles Cates
Mechanical Engineer/Recorder Specialist

APPENDIX A. CVR QUALITY RATING SCALE

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

Excellent Quality Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.

Good Quality Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.

Fair Quality The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.

Poor Quality Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.

Unusable Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.

APPENDIX B. CVR TRANSCRIPT

The following is a transcript of a Fairchild A-100A tape cockpit voice recorder, serial number 59001, installed on a Private Israel Aircraft Industries 1125 Westwind Astra, N1125A, which crashed March 10, 2024 at Ingalls Field (HSP) in Hot Springs, Virginia.

LEGEND

CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N1125A
ZDC	Radio transmission from Washington center controller
-1	Voice identified as the captain
-2	Voice identified as the first officer
*	Unintelligible word
#	Expletive
()	Questionable insertion
[]	Editorial insertion

Note 1: Times are expressed in eastern daylight time.

Note 2: Generally, only radio transmissions to and from the accident aircraft were transcribed.

Note 3: Words shown with excess vowels, letters, or drawn-out syllables are a phonetic representation of the words as spoken.

Note 4: A non-pertinent word, where noted, refers to a word not directly related to the operation, control, or condition of the aircraft.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
START OF RECORDING			
1422:18.0			
START OF TRANSCRIPT			
1438:33.0 HOT-2	do you think we need ignitions sir?		
1438:37.2 HOT-1	* yeah. go ahead.		
1438:39.7 HOT-2	ok		
1438:40.4 CAM	[sound similar to igniter audio feedback, continued through remainder of recording]		
1438:45.8 HOT-2	both engines ignition turned on.		
1438:47.3 HOT-1	all right.		
1438:47.6 HOT-2	and speed two five zero.		
1439:02.4 HOT-2	and I'm gonna give you turbulence. turbulence selected okay?		
1439:06.3 HOT-1	thank you.		

1439:23.1 [sound similar to yawn] okay.
HOT-1

1439:32.2 november two five alpha descend and maintain seven
ZDC- thousand advise when you have the weather and
ARTCC NOTAMs for Hot Springs airport.

1439:38.3 descend and maintain seven thousand will advise uh...
RDO-2 * two five alpha.

1439:42.8 seven thousand (set/selected).
HOT-2

1439:53.0 and ten thousand feet procedures.
HOT-2

1439:55.4 okay.
HOT-1

1439:55.9 landing lights. speed restriction two five zero.
HOT-2 and sterile cockpit. * try that uh...

1440:00.9 okay
HOT-1

1440:04.6 ...the A-TIS one more time.
HOT-2

1440:12.1
AWOS Ingalls field airport. automated weather observation
one eight three niner zulu weather wind two eight
zero at two five gust three six. visibility one zero.
ceiling missing. temperature minus two celsius. dew
point minus niner. altimeter two niner six five.

1440:41.9
RDO-2 and center two five alpha has the weather at uh
Ingalls.

1440:46.0
ZDC-ARTCC november two five alpha thank you and just to verify
you did say you had the NOTAMs also?

1440:50.0
RDO-2 sir uh we-we show uh no NOTAMs uh two five alpha.

1440:54.2
ZDC-ARTCC * I just have to ask you its required of me.

1440:57.0
RDO-FO sir we have the NOTAMs uh two five alpha.

1441:02.3 the weather?
HOT-1

1441:03.5 NOTAMs.
HOT-2

1441:04.3 oh.
HOT-1

1441:05.7 there's nothing I checked *.
HOT-2

1441:06.7 there's nothing right?
HOT-1

1441:07.2 no.
HOT-2

1441:13.3 look. nothing. airport...nothing. nothing.
HOT-2 nothing here.

1441:22.3 I think I saw the airport right there.
HOT-1

1441:24.3 (yeah/ok).
HOT-2

1441:29.1 ok check your wing. no ice?
HOT-1

1441:32.1 oh # yeah we have ice sir.
HOT-2

1441:34.0 * ice on?
HOT-1

1441:34.9 yeah we have ice.
HOT-2

1441:35.3 okay.
HOT-1

1441:36.0 okay?
HOT-2

1441:36.4 yeah go ahead.
HOT-1

1441:36.6 left engine anti ice. I-T-T is rising.
HOT-2

1441:40.1 right engine. anti ice. I-T-T is rising. and de-icing
HOT-2 boots normal okay?

1441:48.0 okay *.
HOT-1

1441:49.5 normal select.
HOT-2

1441:55.7 look.
HOT-1

1441:57.3 yeah.
HOT-2

1442:01.1 okay it's working. great.
HOT-1

1442:16.2 master caution for nacelle. that's power.
HOT-2

1442:39.0 okay.
HOT-1

1442:46.7 [sound similar to altitude alerter]
CAM

1442:47.5 one thousand to go.
HOT-2

1442:49.0 okay.
HOT-1

1443:03.0 see the ice right there?
HOT-1

1443:04.0 yeah yeah.
HOT-2

1443:06.0 speed two twenty.
HOT-2

1443:07.5 two twenty.
HOT-1

1443:08.5 *.
HOT-2

1443:11.6 I will (take/check) two thirty two twenty.
HOT-1

1443:13.5 yeah no problem sir.
HOT-2

1443:17.0 two fifty too much. ha ha ha.
HOT-1

1443:18.5 yeah. correct.
HOT-2

1443:26.1 * * * (to/too/two) *.
HOT-2

1443:34.4 *
HOT-1

1443:38.9 alt caps.
HOT-2

1443:40.5 okay.
HOT-1

1443:50.3 [sound of sigh] I don't know if its breaking the
HOT-2 ice sir.

1444:05.0 oh my god.
HOT-1

1444:08.4 would like to descend to six thousand.
HOT-1

1444:10.3 yeah.
HOT-2

1444:10.5 [sound similar to pitch trim alerter]
CAM

1444:10.5 [sound of chuckle]
HOT-1

1444:12.1 nah. no problem. they're gonna *. its clear.
HOT-1

1444:15.0 okay.
HOT-2

1444:17.6 holy #.
HOT-2

1444:19.3 [sound of chuckle]
HOT-1

1444:33.8 [sound similar to pitch trim alerter]
CAM

1444:40.3 we can ask one thousand feet below right?
HOT-2

1444:45.2 go ahead.
HOT-1

1444:45.4 center two five alpha can we get a uh a descent down
RDO-2 to six thousand?

1444:52.6 and who was that um say again?
ZDC-ARTCC

1444:54.7 one one- one one two five alpha sir.
RDO-2

1444:58.3 two five alpha descend and maintain six thousand one
ZDC-ARTCC hundred. and you are five miles from AHLER turn left direct AHLER cross AHLER at or above six thousand one hundred feet. cleared I-L-S runway two five approach hot springs airport.

1445:05.0 [sound similar to altitude alerter]
CAM

1445:11.4 'kay uh six thousand till established and uh direct
RDO-2 AHLER we're clear for the I-L-S uh two five approach and uh can we get um a vector instead of uh direct AHLER please two five alpha.

	1445:23.0 ZDC-ARTCC	two five alpha roger AHLER. uh do you do you just want full vectors for the I-L-S or can you just go direct AHLER?
	1445:29.6 RDO-2	uh you know what we can go direct AHLER one one two five alpha.
	1445:33.2 ZDC-ARTCC	two five alpha roger. and ma...cross AHLER at or above six thousand one hundred feet please.
1445:38.8 HOT-1		six thousand one.
	1445:39.5 RDO-2	AHLER at or above six thousand one hundred uh, one one two five alpha.
1445:45.6 HOT-2		and nav available. it should start turning right now.
1445:49.5 HOT-1		to the left.
1445:49.9 HOT-2		to the left yup.
1445:50.6 CAM		[sound similar to pitch trim alerter, audible 3 times]

1445:50.9 yup.
HOT-1

1446:05.3 oh kay.
HOT-1

1446:15.9 would you like uh slats sir?
HOT-2

1446:19.5 gimme slats yeah.
HOT-1

1446:20.8 speed checks slats selected out. master caution
for slats out. okay?
HOT-2

1446:24.8 yeah.
HOT-1

1446:30.1 reducing speed to two hundred.
HOT-1

1446:31.8 check.
HOT-2

1446:34.8 flap twelve.
HOT-1

1446:36.1 speed checks. flaps twelve selected. alt caps.
HOT-2

1446:39.6 right.
HOT-1

1446:41.8 and we have it right there. F-LOC captured my
HOT-2 side. F-LOC captured your side. good.

1446:44.8 my side too. good.
HOT-1

1446:47.8 fantastic. okay. AHLER six thousand one
HOT-2 hundred sir.

1446:51.9 november two five alpha verify you're maintaining six
ZDC- thousand one hundred feet until *...please.
ARTCC [transmission partially broken]

1446:56.3 yes sir we're six thousand one hundred and we're now
RDO-2 intercepting the localizer one one two five alpha.

1447:01.4 speed two hundred.
HOT-2

1447:08.5 [sound similar to pitch trim alerter]
CAM

1447:09.7 and standing by flaps twenty.
HOT-2

1447:16.8 you forgot to ask about the phone number. it
HOT-1 doesn't matter. no problem.

1447:33.1 I'll just advise him okay. that I'll cancel on
HOT-2 ground.

1447:35.9 okay. yeah. sure.
HOT-1

1447:37.2 center uh one one two five alpha uh just to dub...uh
RDO-2 notify you we're going to cancel I-F-R on the ground
with flight service station.

1447:46.2 two five alpha roger. and uh you can reach me on this
ZDC- frequency on the ground just so you know. and uh two
ARTCC five alpha don't forget to report the cancellation of I-F-
R on this frequency on the ground or flight service.
and uh change to advisory frequency approved, no
traffic observed between you and Hot Springs airport.

1448:01.5 thank you. * uh change to frequency advisory one one
RDO-2 two five alpha.

1448:08.4 [sound of beep similar to radio frequency change]
RDO

1448:09.2 and...
HOT-2

1448:12.2 that's uh AHLER sir, six thousand one hundred.
HOT-2 and...

1448:16.5 what's that frequency? one two three zero zero?
HOT-1

1448:18.3 one two three yeah- one two three zero zero.
HOT-2

1448:21.6 and I can set the next frequency sir if you'd like.
HOT-2 uh sorry next uh altitude. altitude there you go,
 yes.

1448:25.3 uh altitude altitude yes.
HOT-1

1448:27.3 five thousand one hundred selected. okay?
HOT-2

1448:27.8 [sound similar to altitude alerter]
CAM

1448:29.1 okay.
HOT-1

1448:29.8 would you like uh. V-S?
HOT-2

1448:31.5 yes.
HOT-1

1448:32.1 okay V-S selected your side. five thousand one
HOT-2 hundred.

1448:37.1 [sound similar to altitude alerter]
CAM

1448:42.1 six miles to DURAN.
HOT-2

1448:45.2 okay its descending.
HOT-1

1448:47.4 check.
HOT-2

1448:48.1 [sound similar to dial being turned three times]
CAM

1448:52.8 [sound similar to altitude alerter]
CAM

1448:54.2 and we have (rain/RAIM²) sir.
HOT-2

1448:56.0 yes.
HOT-1

1449:10.6 okay, four miles to...
HOT-2

1449:12.5 Ingalls uh traffic you got a astra is on the uh I-L-S uh
RDO-2 two five approach uhh full stop.

1449:25.2 that's Ingalls traffic right?
HOT-1

1449:27.9 yup Ingalls traffic yeah.
HOT-2

² According to the Operator's Manual, a Receiver Autonomous Integrity Monitoring (RAIM) check is conducted as a part of the approach initiation for precision GPS approaches. The check was not necessary for the ILS approach the crew was flying.

1449:30.9 okay ke- uh. the engine...ah no...that's fine.
HOT-1 leave it there. [sound of chuckle]

1449:34.4 okay. yeah. we'll- we'll keep it there.
HOT-2

1449:36.9 yup.
HOT-1

1449:40.5 alt caps.
HOT-2

1449:41.7 okay.
HOT-1

1449:42.8 gimme flap...twenty.
HOT-1

1449:45.0 flaps twenty selected.
HOT-2

1449:45.2 yeah to reduce speed.
HOT-1

1449:47.8 yup.
HOT-2

1449:51.2 [sound similar to pitch trim alerter two times]
CAM

1449:53.4 flaps twenty selected.
HOT-2

1449:56.7 'kay.
HOT-1

1449:57.7 do you see the airport?
HOT-1

1449:59.5 uh no sir, not yet.
HOT-2

1450:02.1 not yet.
HOT-1

1450:02.8 no.
HOT-2

1450:03.6 and alts. speed descending * one eighty.
HOT-2

1450:09.9 'kay. okay there is the airport. I saw it.
HOT-1

1450:12.4 okay. I see it now.
HOT-2

1450:16.8 twenty? yes.
HOT-1

1450:18.0 yup. flaps twenty selected.
HOT-2

1450:20.2 okay. one...landing gear. did we get it?
HOT-1

1450:25.1 eh...we're waiting for uh one dot above.
HOT-2

1450:28.0 yeah. one dot above. when you get it one dot...
HOT-1

1450:31.4 yup.
HOT-2

1450:46.4 okay DURAN.
HOT-1

1450:48.2 okay...
HOT-2

1450:49.0 descending.
HOT-1

1450:51.1 and...
HOT-2

1450:53.3 next altitude is?
HOT-1

1450:55.2 next altitude is uh four thousand, sir. you want
HOT-2 four thousand?

1450:58.8 four thousand.
HOT-1

1450:59.4 yeah.
HOT-2

1450:59.8 yeah I set four thousand one hundred. uh speed
HOT-2 checks gear selected down.

1451:00.0 [sound similar to altitude alerter]
CAM

1451:02.3 [sound similar to landing gear extension]
CAM

1451:04.2 before landing.
HOT-1

1451:04.7 yeah before landing checklist.
HOT-2

1451:06.2 twenty five hundred. [electronic voice]
EGPWS

1451:07.2 [sound similar to pitch trim alerter three times]
CAM

1451:11.6 look there's snow ha ha ha. you see it?
HOT-1

1451:12.7 yup. yup.
HOT-2

1451:16.3 okay gear is set uh three green. and I can go
HOT-2 flaps forty when you like.

1451:21.4 okay give me now.
HOT-1

1451:22.5 flaps forty selected okay before landing
HOT-2 checklist uh...let's check the right T-R right T-R is
turned on. ground air brakes is turned on.
master caution for nacelle. and I show you
below glide slope.

1451:37.9 okay.
HOT-1

1451:38.9 full below glide slope.
HOT-2

1451:40.9 [sound similar to pitch trim alerter four times]
CAM

1451:42.6 okay *...
HOT-1

1451:45.3 and V-REF is one twenty five V-REF plus fifteen.
HOT-2

1451:49.8 okay. oh my gosh. [sound of chuckle] let me put
HOT-1 the autopilot off.

1451:50.6 [sound of click]
CAM

1451:50.9 [sound of high-low tone similar to autopilot
CAM disconnect]

1451:53.5 okay. autopilot...on or off?
HOT-2

1451:58.5 on or off?
HOT-2

1451:58.7 shhh...
HOT-1

1451:59.2 [sound similar to pitch trim alerter for 3.3
CAM seconds]

1452:00.1 its off?
HOT-1

1452:00.7 its uh...its no its off yeah.
HOT-2

1452:03.8 okay.
HOT-1

1452:05.5 *
HOT-1

1452:06.0 [sound similar to engine power reduction]
CAM

1452:12.0 [sound similar to pitch trim alerter for 1.1
CAM seconds]

1452:12.7 one thousand [electronic voice]
EGPWS

1452:14.4 sir I suggest go around.
HOT-2

1452:16.4 [sound of momentary radio key]
RDO-1

1452:17.1 go around [spoken with increased intensity]
HOT-2

1452:17.4 five hundred [electronic voice]
EGPWS

1452:18.4 #! #! * #!
HOT-1

1452:19.8 [sound of grunt]
HOT-2

1452:20.9 [sound of impact]
CAM

1452:21.3
END OF TRANSCRIPT
END OF RECORDING