

**NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Vehicle Recorder Division
Washington, D.C. 20594**



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

DCA20IA014

**By
Michael Portman**

WARNING

The reader of this report is cautioned that the transcript of a cockpit voice recorder audio recording is not a precise science but is the best product possible from an NTSB group investigative effort. The transcript or parts thereof, if taken out of context, could be misleading. The 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 transcript as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

June 25, 2020

Cockpit Voice Recorder

Group Chairman's Factual Report By Michael Portman

1. EVENT SUMMARY

Location: Atlanta, Georgia
Date: November 6, 2019
Aircraft: Embraer ERJ-170-200LR, Registration N117HQ
Operator: Republic Airways, Flight 4439
NTSB Number: DCA20IA014

On November 6, 2019, about 2115 eastern standard time (EST), Republic Airways flight 4439, an Embraer ERJ-170-200LR, N117HQ, experienced a pitch trim anomaly shortly after takeoff from Hartsfield-Jackson Atlanta International Airport (ATL), Atlanta, Georgia. The flight crew declared an emergency and returned to ATL. None of the 9 passengers and crew on board were injured and the airplane was not damaged. The airplane was operating under the provisions of Title 14 *Code of Federal Regulations (CFR)* Part 121 as regularly scheduled passenger flight and was destined for LaGuardia Airport (LGA), New York, New York. A solid-state digital voice and data recorder (DVDR) was sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for evaluation. The CVR group meeting convened on February 18, 2020, and a summary and partial transcript was prepared for the two-hour, six-minute, forty-six-second digital recording (see attached).

2. GROUP

Chairman:	Michael Portman Aerospace Engineer - Recorder Specialist National Transportation Safety Board
Member:	Patrick Lusch Air Safety Investigator Federal Aviation Administration
Member:	Jeff Shoaf Senior Technical Representative Embraer

Member: Timothy Simpson
Senior Manager, IND Maintenance
Republic Airways

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model: **Honeywell 6025**
Recorder Serial Number: **DVDR-00268**

3.1 CVR Carriage Requirements

Per federal regulation, turbine engine powered aircraft operating under 14 CFR Part 121 must be equipped with a CVR that records a minimum of the last 2 hours of aircraft operation; this is accomplished by recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 2 hours of CVR operation.

3.2 Recorder Description

This model CVR, the Honeywell 6025, records a minimum of 120 minutes of digital audio stored on solid-state memory modules. Four channels are recorded: one channel for each flight crew, one channel for a cockpit observer, and one channel for the cockpit area microphone (CAM).

3.3 Recorder Damage

Upon arrival at the laboratory, it was evident that the CVR had not sustained any heat or structural damage and the audio information was extracted from the recorder normally, without difficulty.

3.4 Audio Recording Description

Each channel's audio quality is indicated in Table 1.¹

Table 1. Audio Quality.			
Channel Number	Content/Source	Quality	Duration (HH:MM:SS.S)
1	Captain	Excellent	2:02:59.5
2	First Officer	Excellent	2:02:59.5
3	Observer	Excellent	2:02:59.5
4	CAM	Fair	2:06:45.7

The recording contained four channels of audio information and was consistent with the CVR being overwritten or recorded over by subsequent events. Characteristics of overwritten CVRs include:

¹ See attached CVR Quality Rating Scale.

- Audio consistent with the airplane being stationary on the ground with electrical power on.
- Conversations or other audio consistent with maintenance personnel working in or near the cockpit.
- Background sounds in an unoccupied cockpit such as:
 - Radio transmission from other aircraft or ground facilities.
 - Unintelligible or difficult to discern conversation or other sounds likely emanating from the cabin or outside the airplane.

However, the audio obtained included a maintenance troubleshooting conversation which was deemed pertinent to the investigation, and a summary and partial transcript was therefore produced. All of the transcribed conversations and sounds were recorded from the CAM.

3.5 Timing and Correlation

The timing of this transcript is in recorder elapsed time. Due to the lack of outgoing radio transmissions and corresponding flight data recorder data, as well as the frequent power cycles, no correlation was performed to establish the relationship of elapsed time to the local time of the recording.

3.6 Description of Audio Events

The recording and the transcript began simultaneously. The aircraft had arrived at the gate and the captain described the actions he and the first officer had taken. After a power cycle at 0000:27 Elapsed Time (ET), a maintenance crew was then heard troubleshooting various control-related elements of the aircraft. Over the next hour and ten minutes of recorder elapsed time, several power cycles were noted, and multiple maintenance crews identified. This included two phone calls to Republic Airways' Maintenance Control Center (MCC) to discuss elements of the troubleshooting process, as well as to provide updates on the results of the system tests ran. Beginning after the power cycle at 0110:51 ET, the recording was largely silent, except for a brief conversation by an unidentified flight crew, determined to be non-pertinent, at 0124:00 ET. At 0205:09 ET, a maintenance crew member boarded the aircraft and called the MCC to identify the FDR/CVR circuit breakers. The recording ended shortly thereafter at 0206:46 ET.

Attachment I

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.

Transcript and summary of a Honeywell 6025 solid-state cockpit voice recorder, serial number DVDR-00268, installed on a Republic Airways Embraer ERJ-170-200LR (N117HQ), which experienced a pitch trim anomaly after takeoff from Hartsfield-Jackson Atlanta International Airport in Atlanta, Georgia.

LEGEND

CAM	Cockpit area microphone voice or sound source
EICAS	Engine-indicating and crew-alerting system annunciation
-1	Voice identified as the incident flight captain
-2	Voice identified as an aircraft mechanic
-3	Voice identified as an aircraft mechanic
-4	Voice identified as an aircraft mechanic
-5	Voice identified as an aircraft mechanic
-6	Voice identified as an aircraft mechanic
-?	Voice unidentified
*	Unintelligible word
#	Expletive
@	Non-pertinent word
()	Questionable insertion
[]	Editorial insertion

Note 1: Times are expressed in recorder elapsed time.

Note 2: Words shown with excess vowels, letters, or drawn-out syllables are a phonetic representation of the words as spoken.

Note 3: 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
0000:00.0	
START OF RECORDING START OF TRANSCRIPT	
00:00:00.1 CAM-1	to um ya know pitch the plane down using the pitch trim on the yoke and on the um right below the radio panel...yeah I tried to—I tried to pitch the plane down using those and like nothing was giving umm...and then the F-O was doing it at the same time but again like we were fighting and it was...ya know as violent or more than in the sim cause like in the sim like you know...you have your knees on the yoke and— [cut off by power cycle]
00:00:27.3 CAM	[sound similar to power cycle]
00:00:32.0 CAM-2	flashlight?
00:00:33.8 CAM-?	***.
00:00:40.1 CAM-2	flight control...is...pitch up.
00:00:44.4 EICAS	[sound similar to Master Warning]
00:00:49.9 CAM-2	'kay I can't read that # #.
00:00:52.6 CAM-3	flight control issue—pitch up.
00:00:55.9 CAM	[sound similar to button pushing]

Time and Source	Intra-Aircraft Communication
00:01:00.6 CAM-2	uhh...* the battery...uh...*...battery one and two off.
00:01:08.7 EICAS	[sound similar to Master Caution]
00:01:11.6 CAM-3	***.
00:01:21.4 CAM-3	flight control issue—pitch up.
00:01:26.4 CAM-2	pitch trim...switch one fail.
00:01:53.2 CAM-3	***.
00:01:59.3 CAM-3	(any idea?)
00:02:02.9 CAM-2	what—this issue?
00:02:04.7 CAM-3	pitch trim (switch one fail/that's what) we're talking about.
00:02:09.8 CAM-3	today written up.
00:02:28.1 CAM-3	at LaGuardia earlier today...wrote pitch trim switch one...according to *...I wonder if this belongs to them...LaGuardia.

Time and Source	Intra-Aircraft Communication
00:02:47.2 CAM-2	oh a screwdriver set–nice.
00:03:03.1 CAM	[sound similar to ratcheting screwdriver]
00:03:15.1 EICAS	[sounds similar to Master Cautions]
00:03:17.5 CAM-2	flight control no dispatch.
00:03:19.6 CAM	[sound similar to button pushing]
00:03:21.7 CAM-2	**.
00:03:25.5 CAM	[sound similar to ratcheting screwdriver]
00:03:31.1 CAM-2	theeee...
00:04:02.6 CAM-3	(three green) *** (let's see what happens).
00:04:05.6 CAM-2	we need to take this to go to R-T-S don't we?
00:04:11.0 CAM-3	uhh...gotta–ya gotta give it a minute or so to...
00:04:14.0 CAM-2	yeah...something...

Time and Source	Intra-Aircraft Communication
00:04:14.9 CAM-3	...(I-R-U's aligning and #).
00:04:30.1 CAM-2	there it is...maintenance.
00:04:44.5 CAM-?	***.
00:04:47.9 CAM-3	diagnostics and *** and maintenance.
00:04:53.0 CAM-2	**.
00:05:09.3 CAM-2	I don't think it's under this.
00:05:16.1 CAM-2	there it is.
00:05:20.9 CAM-3	all right...follow the A-M-M...*** (hydraulics) ***.
00:05:34.2 CAM-2	hydraulics.
00:05:38.9 CAM-2	going on auto...everything else is (on auto/in off).
00:05:42.6 CAM-2	so push the start to R-T-S.
00:05:49.2 CAM-2	* this would be green though...right?

Time and Source	Intra-Aircraft Communication
00:05:52.4 CAM-3	umm...yeah it should.
00:05:55.2 CAM-2	T-L-A is in the idle position.
00:05:58.8 CAM-2	don't we have to flip this breaker over here?
00:06:02.0 CAM-3	it didn't tell me to...I think it says (we can do it later *).
00:06:17.5 CAM-2	on...on?
00:06:20.0 CAM-2	system one...system—
00:06:22.9 CAM-3	*** auto...
00:06:30.7 CAM-2	T-L-A...what's the T-L-A?
00:06:36.8 CAM-3	(okay...okay).
00:06:40.7 CAM-?	***.
00:06:45.4 CAM-3	three and only one of them ***...
00:06:47.9 CAM-2	so we gotta leave them on?

Time and Source	Intra-Aircraft Communication
00:06:51.5 CAM-2	three so that's on and B...that's electric pump B for system three.
00:06:58.1 CAM-?	* on.
00:07:01.9 CAM-2	now...okay...good.
00:07:04.1 CAM-2	we just (need to/didn't) pressurize hydraulics.
00:07:12.4 CAM-2	***.
00:07:14.5 CAM-3	oh we gotta clear the inhibits...remember we gotta do that.
00:07:17.8 CAM-2	umm...okay...go back to uhh...
00:07:24.6 CAM-3	***.
00:07:32.4 CAM-2	***.
00:07:34.7 CAM-3	***.
00:07:42.8 CAM-3	okay...pass pass pass pass pass *** push forward *.
00:07:54.2 CAM-2	*** spot.

Time and Source	Intra-Aircraft Communication
00:07:59.3 CAM-3	okay...set the F-C-S maintenance switch to the on position.
00:08:03.0 CAM-2	it's this one?
00:08:04.0 CAM-3	right there...yeah.
00:08:12.9 CAM-?	***?
00:08:16.0 CAM-2	on position?
00:08:17.2 EICAS	[sound similar to Master Caution]
00:08:19.9 CAM	[sound similar to button pushing]
00:08:21.6 CAM-3	verify that everything is green and...push clear ROM.
00:08:35.2 CAM-3	that should clear all the inhibits right there.
00:08:41.1 CAM-3	set the F-C-S maintenance off.
00:08:49.6 CAM-2	make sure there are no F-C-S active...is that EICAS message?
00:08:59.9 CAM-3	make sure ** F-C-S ***.

Time and Source	Intra-Aircraft Communication
00:09:09.4 CAM-2	it's that flight control no dispatch...that's the message.
00:09:14.4 CAM-3	that's what we're trying to clear here.
00:09:16.4 CAM-2	yeah...well that's what I'm saying that's the only one that...
00:09:19.8 CAM-3	yeah.
00:09:22.0 CAM-3	***.
00:09:28.2 CAM-3	can you go out and take pictures of the (right).
00:09:33.6 CAM-2	what—around the uh—moving?
00:09:35.2 CAM-3	(leading edge) *** nothing around the wings or anything that can get hit.
00:09:39.0 CAM-2	aright.
00:09:40.8 CAM-2	[security code] yeah?
00:09:42.7 CAM-3	yeah [security code].

Time and Source	Intra-Aircraft Communication
00:10:32.6 CAM-3	move...the column fully forward and hold it for three seconds...***...then fully aft for three seconds then push the elevator * push button...good?
00:10:46.7 CAM-2	yeah.
00:11:01.3 CAM-3	F-C-P push button?
00:11:08.9 CAM-3	elevator is ***.
00:11:15.2 EICAS	[sound similar to Master Caution]
00:11:17.8 CAM-2	elevator off.
00:11:20.2 CAM	[sound similar to button pushing]
00:11:26.0 CAM-2	F-C-...
00:11:28.3 CAM-?	***.
00:11:33.3 CAM-3	push the column fully forward for three seconds.
00:11:49.5 CAM-3	good?

Time and Source	Intra-Aircraft Communication
00:11:52.4 CAM-2	'kay.
00:11:56.7 CAM-2	*** they're all (good/green) now...(weIIII) ...
00:12:01.7 CAM	[unintelligible conversation]
00:12:07.3 CAM-3	move the left hand rudder pedal to the end and hold it for three seconds.
00:12:15.0 CAM-2	is this correct?...oh yeah that one.
00:12:21.4 CAM	[unintelligible conversation]
00:12:33.4 CAM-3	next...push the rudder...for three seconds.
00:12:36.8 EICAS	[sound similar to Master Caution]
00:12:39.6 CAM	[sound similar to button pushing]
00:12:41.3 CAM-3	release it...do it again...hold it for about six seconds.
00:12:58.4 CAM-2	there we go.
00:13:05.2 CAM-3	roll the control yoke fully to the C-C-W direction...hold it for three seconds.

Time and Source	Intra-Aircraft Communication
00:13:10.8 CAM-2	that's what left?
00:13:24.8 CAM-3	move the speed brake handle to the fully extended position...over here.
00:13:31.5 CAM-2	speed brake...full?
00:13:36.6 CAM-?	***.
00:13:40.4 CAM-2	** speed brake.
00:13:52.4 CAM-3	and then ***.
00:13:58.3 CAM-2	forward to continue...press.
00:14:04.0 CAM-3	set F-C-S maintenance switch on.
00:14:11.5 EICAS	[sound similar to Master Caution]
00:14:12.3 CAM	[sound similar to button pushing]
00:14:15.5 CAM-2	clear N-V-M.
00:14:24.0 CAM-?	now set...now set the switch to off.

Time and Source	Intra-Aircraft Communication
00:14:33.4 CAM-?	***.
00:14:45.1 CAM-3	(I just want to **/flight control no dispatch).
00:14:48.1 CAM-2	okay umm...let's go...
00:14:56.5 CAM-3	***.
00:15:17.8 CAM	[sound similar to phone calling]
00:15:29.6 CAM-3	[call to MCC - described pilot write up to MCC, mentioned the maintenance crew performed the flight control no dispatch procedure, described actions taken, everything was green, mentioned the fault message cleared when the Return To Service (RTS) was performed, everything passed on the RTS (but there's still something), hydraulics were on. Mentioned fault code 27430200HS2, discussed fault history, mentioned everything was cleared, discussed elevator/trim stuck, confirmed flight control movement. Call ended at 37:30.28]
00:20:27.1 EICAS	[sound similar to Master Caution]
00:21:16.7 CAM-3	it's stuck in the up position...* five point eight it's not moving at all... okay...the...the actual elevators are moving but * the indicator on the middle one is showing pitch up at five point eight...it's just stuck there no matter what.
00:21:42.5 CAM-3	the elevators are still moving...I don't really know how that setting there (determines anything).
00:21:50.7 CAM-?	pitch up pitch down.

Time and Source	Intra-Aircraft Communication
00:21:55.2 CAM-3	when I look at the flight control page...I can see the elevators definitely are going up and down.
00:22:25.6 CAM-3	I don't really know how the system works on the...the center display.
00:22:42.1 CAM-3	but...they're movin' and they're...can you go back and check and make sure that they're movin'.
00:22:46.2 CAM-2	I mean...up...so I can't see down so I'll go check down...if this * stays in position right here.
00:22:51.3 CAM-3	nah it (just cleared/disappeared).
00:23:02.0 CAM	[unintelligible conversation]
00:23:49.8 CAM	[sound similar to power cycle]
00:23:52.3 CAM-2	I mean I don't know which air is on.
00:23:55.2 CAM-2	scroll up.
00:24:06.6 EICAS	[sound similar to Master Caution]
00:24:07.9 CAM	[sound similar to button pushing]
00:24:27.7 CAM-2	we can't move any of the flight controls right now.

Time and Source	Intra-Aircraft Communication
00:24:29.4 EICAS	[sound similar to Master Caution]
00:24:35.1 CAM-2	RAT fail...that's normal...but still...five point eight up.
00:24:43.3 CAM-2	and the roll is like...is it supposed to be like...
00:24:46.5 CAM-3	***.
00:24:56.5 CAM-3	I think it's kinda supposed to be like that ***.
00:25:09.6 CAM-2	I guess we'll see what he says.
00:25:23.5 CAM-2	what are these right here?
00:25:26.0 CAM-3	I was about to check.
00:25:29.7 CAM	[unintelligible conversation]
00:25:53.2 CAM-3	okay well...***.
00:25:59.3 CAM-3	there should be two areas.
00:26:03.6 CAM-3	*** (log page right there) ***.

Time and Source	Intra-Aircraft Communication
00:26:21.7 CAM-2	we'll have to turn hydraulics on to move the flight controls right?
00:26:42.5 CAM	[unintelligible conversation]
00:26:52.5 CAM-2	hydraulic pump not auto.
00:27:08.1 CAM-2	how much uh...so how do you know whenever you're ready to...to move the flight controls on this screen like what's the pressure supposed to be at or?
00:27:18.8 CAM-3	system's pressurized now...just supposed to be in the green.
00:27:21.0 CAM-2	okay...so...I'm gonna open the door.
00:27:22.5 CAM-3	***.
00:27:24.9 CAM-2	push forward on the yoke...oh.
00:27:26.7 CAM-3	***.
00:27:28.9 CAM-2	yep...***.
00:27:38.1 CAM-2	*.

Time and Source	Intra-Aircraft Communication
00:27:38.2 EICAS	trim. [electronic voice]
00:27:40.0 CAM-2	what was that?
00:27:42.0 CAM-3	I dunno.
00:27:43.0 CAM-2	did you hear that...is that the control...the tower?
00:27:46.3 CAM-3	yeah it's ** plane ** trim *** it's saying that I moved the trim down...***.
00:27:59.5 EICAS	trim. [electronic voice]
00:28:02.6 CAM-2	um?
00:28:07.6 CAM-2	steer disc.
00:28:09.6 CAM-3	***.
00:28:10.6 CAM-2	roll...roll...there's no way to do roll.
00:28:15.4 CAM-3	no there is.
00:28:22.2 CAM	[unintelligible conversation]

Time and Source	Intra-Aircraft Communication
00:28:31.5 CAM-2	roll right here.
00:28:36.2 CAM-2	so we're good ** just to take my mind at ease...push the...push the yoke forward so I can see...visually see the # move.
00:29:03.1 CAM-2	good?
00:29:07.0 CAM-2	like it's going down like it doesn't look like it's...***.
00:29:13.8 CAM-3	** a little further.
00:29:15.7 CAM-2	yeah.
00:29:16.8 CAM-2	I'm gonna go out further just keep it held forward...in the forward position.
00:29:20.6 CAM-3	***...I'm not sure if forward is down.
00:29:33.0 CAM-3	***.
00:29:47.2 CAM-3	yeah figured out why the the center display didn't change unless you ***...***.
00:30:06.5 CAM-3	all right sounds good.

Time and Source	Intra-Aircraft Communication
00:30:12.1 CAM-3	good?
00:30:30.0 CAM-3	mhm.
00:30:37.1 CAM-3	***.
00:30:47.5 CAM-3	uh it's...yeah all the controls are operating ***.
00:31:24.0 CAM-3	it was at...it was set at five point six...the green range is ***. [cut off by background noise]
00:31:43.5 EICAS	trim. [electronic voice]
00:31:52.1 EICAS	trim. [electronic voice]
00:31:54.3 CAM-3	okay...yeah so it goes all the way down to two...two down and the high...
00:32:01.3 EICAS	trim. [electronic voice]
00:32:03.7 CAM-3	***.
00:32:05.5 EICAS	trim. [electronic voice]
00:32:14.6 EICAS	trim. [electronic voice]

Time and Source	Intra-Aircraft Communication
00:32:19.8 EICAS	trim. [electronic voice]
00:32:44.6 EICAS	trim. [electronic voice]
00:32:45.6 EICAS	trim. [electronic voice]
00:33:15.9 CAM-3	***pitch trim...uh...***...five point eight...now it's sayin' five point seven ***...yeah it was in the green for **.
00:33:41.3 EICAS	trim. [electronic voice]
00:33:46.8 EICAS	trim. [electronic voice]
00:33:54.0 EICAS	trim. [electronic voice]
00:33:59.6 EICAS	trim. [electronic voice]
00:34:04.7 EICAS	trim. [electronic voice]
00:34:11.3 EICAS	trim. [electronic voice]
00:34:16.7 EICAS	trim. [electronic voice]
00:34:47.8 EICAS	trim. [electronic voice]

Time and Source	Intra-Aircraft Communication
00:34:55.6 EICAS	trim. [electronic voice]
00:35:01.2 EICAS	trim. [electronic voice]
00:35:14.2 EICAS	trim trim trim trim trim trim trim. [electronic voice]
00:35:27.1 CAM-3	it's not up there now when I first got on it was saying that too but then we did the return to service test and it cleared but it still had the flight control no dispatch...that message cleared.
00:35:58.0 CAM-3	yeah like I said - when I came on the plane it was all turned off...power was *... and when it came back up that message had cleared - the switch message *** but it also had flight control no dispatch *** R-T-S and everything passed on the R-T-S and the message went away but it's still *** that's when I called you *** H-S-ACE two *** both the system cutouts on...*** that flight control no dispatch went away ***.
00:36:42.2 CAM	[unintelligible conversation, end of phone call]
00:37:31.8 CAM-2	[discussion of operation of cockpit window]
00:37:48.8 CAM	[discussion of operation of both trim switches required to operate trim, demonstration of trim system operation to junior mechanic, holding switch down]
00:38:19.8 EICAS	trim trim trim. [electronic voice]
00:38:27.8 EICAS	trim. [electronic voice]

Time and Source	Intra-Aircraft Communication
00:38:29.3 CAM-3	apparently...it started trimming on its own.
00:38:34.4 CAM	[discussion about phone calls with MCC]
00:39:17.9 CAM-3	I'm leaving it in the exact position I found it.
00:39:29.4 CAM	[sound similar to power cycle]
00:39:52.9 EICAS	[sound similar to Master Warning]
00:39:56.5 EICAS	[sound similar to Master Caution]
00:40:13.7 CAM-4	through and two degrees ***.
00:40:16.5 EICAS	[sounds similar to Master Cautions]
00:40:33.2 CAM-4	apparently this guy went running away.
00:40:39.2 CAM-4	do you know how to control that?
00:40:40.4 CAM-5	no.
00:40:41.9 CAM-4	got it right here.

Time and Source	Intra-Aircraft Communication
00:40:44.9 CAM-4	is it going down?
00:40:45.8 CAM-5	you gotta press both at the same time.
00:40:46.4 EICAS	trim. [electronic voice]
00:40:49.0 CAM-5	so it's supposed to happen after three seconds...that's what didn't happen apparently.
00:40:59.5 CAM-5	put a headset in.
00:41:08.8 CAM-5	goes down to—down two all the way up to thirteen up.
00:41:15.7 CAM-4	(go) three degrees up.
00:41:31.5 CAM	[unintelligible conversation]
00:42:28.6 CAM-5	all right...you got your phone?
00:42:32.8 CAM-4	***.
00:42:34.8 CAM-5	I need you to go out and look at the horizontal stabilizer...we can talk on the phone.
00:43:00.4 CAM-5	see the leading edge of it...are there arrows and # on it?

Time and Source	Intra-Aircraft Communication
00:43:18.1 CAM-5	***.
00:43:37.5 CAM-5	okay...uhh...all right...it's going down?
00:43:45.0 EICAS	trim. [electronic voice]
00:43:53.4 CAM-5	***...okay did it go up or did it go down...like the uh...leading edge?
00:44:05.5 CAM-5	huh?
00:44:07.4 CAM-5	***.
00:44:13.6 CAM-5	it's going back up or going back down to the up position then?
00:44:28.5 CAM-5	all right.
00:44:33.1 CAM-5	(pull/full) down it was already up ***.
00:44:51.0 EICAS	trim trim. [electronic voice]
00:44:53.2 CAM-5	*** down right...down position...*.
00:44:59.3 EICAS	trim. [electronic voice]

Time and Source	Intra-Aircraft Communication
00:45:07.2 EICAS	trim. [electronic voice]
00:45:15.9 EICAS	trim. [electronic voice]
00:45:23.6 CAM-5	** that's full right? ***.
00:45:32.8 EICAS	trim. [electronic voice]
00:45:56.8 CAM-5	we're gonna do the same thing on the other side now.
00:46:06.5 CAM-5	huh...yeah up here—they should be the same...the whole the whole (stabilator/stabilizer) should move so...
00:46:17.1 CAM-5	all right...hopefully it works good.
00:46:24.7 CAM-5	***...set the trim pilot control yoke...T-L-A...I dunno yet gimme a second to start reading.
00:46:40.0 CAM-5	set the pitch backup switch (to full) *... then hold up side of the pitch backup switch ** pitch backup *.
00:46:54.9 CAM-5	I don't know where the pitch backup switch is... let me find it *.
00:47:09.3 CAM-5	pitch backup switch... *** trim up...okay.
00:47:21.5 CAM-5	pitch backup switch ***.

Time and Source	Intra-Aircraft Communication
00:47:40.6 EICAS	trim. [electronic voice]
00:47:42.8 CAM-5	all the way down...is it moving?
00:47:49.1 CAM-5	going *.
00:47:51.3 EICAS	trim. [electronic voice]
00:47:52.0 CAM-5	* should be in the up position now.
00:47:55.7 EICAS	trim. [electronic voice]
00:48:00.9 EICAS	trim. [electronic voice]
00:48:01.5 CAM-5	it keeps saying trim if I hold it for three seconds straight and if it says trim it stops.
00:48:05.6 EICAS	trim. [electronic voice]
00:48:06.8 CAM-5	that's what it's supposed to do...so that way you're not accidentally just pressin' and holdin' it.
00:48:41.0 CAM-5	make sure it's set to ***...okay.
00:49:13.7 CAM-5	** push this **.

Time and Source	Intra-Aircraft Communication
00:49:20.6 EICAS	[sound similar to Master Caution]
00:49:30.6 CAM-5	message...does not show...on this ***...this message shows on EICAS flight control no dispatch.
00:50:34.0 EICAS	[sound similar to Master Caution]
00:50:38.2 CAM-5	flight control no dispatch.
00:50:47.8 CAM-5	**.
00:50:57.6 EICAS	trim trim. [electronic voice]
00:50:59.9 CAM-4	there ya see?
00:51:02.1 CAM-5	is it moving now?
00:51:04.4 EICAS	trim. [electronic voice]
00:51:05.4 CAM-5	strange.
00:51:09.7 EICAS	trim. [electronic voice]
00:51:11.4 CAM-?	*?

Time and Source	Intra-Aircraft Communication
00:51:14.5 EICAS	trim. [electronic voice]
00:51:51.8 CAM-?	huh?
00:52:25.5 CAM-5	everything's good...everything's good.
00:52:50.6 CAM	[unintelligible conversation]
00:52:55.4 EICAS	[sound similar to Master Caution]
00:53:00.2 CAM-5	** control * A-P fail pitch trim fail.
00:53:08.6 CAM-5	all right now I'm gonna go up.
00:53:13.1 CAM-5	is it moving?
00:53:17.7 CAM-5	is it moving?
00:53:22.1 CAM-5	**...is it moving?
00:53:27.6 CAM-5	is it moving?
00:53:40.6 EICAS	[sound similar to Master Caution]

Time and Source	Intra-Aircraft Communication
00:53:48.5 CAM-5	is it moving now?
00:53:51.4 EICAS	trim. [electronic voice]
00:53:52.5 EICAS	trim. [electronic voice]
00:53:56.6 CAM-5	*.
00:53:57.0 EICAS	trim. [electronic voice]
00:53:57.9 CAM-5	***.
00:54:15.2 CAM-5	*** which part number ***?
00:54:29.8 CAM	[unintelligible conversation]
00:55:01.5 CAM-5	it's not moving is it?
00:55:04.6 CAM-5	it's not moving is it?
00:55:06.9 CAM-?	no.
00:55:08.6 CAM-5	now?

Time and Source	Intra-Aircraft Communication
00:55:10.8 EICAS	[sound similar to Master Caution]
00:55:15.9 CAM	[unintelligible conversation]
00:55:45.2 CAM-5	is it moving?
00:55:47.8 CAM-5	yes.
00:55:49.2 CAM-5	yes right?
00:55:54.2 CAM-5	(trim) yes...yes.
00:56:06.0 CAM-5	***.
00:56:13.1 CAM-5	go back to the right side...press ***.
00:56:22.6 CAM-5	is it moving...it's not moving?
00:56:26.9 CAM-5	it's not moving...not moving...
00:56:31.0 EICAS	[sound similar to Master Caution]
00:56:35.1 CAM-?	** pusher fail.

Time and Source	Intra-Aircraft Communication
00:56:46.3 CAM-?	all right.
00:56:55.4 CAM	[unintelligible conversation]
00:57:18.5 CAM-?	power up *.
00:57:22.1 CAM	[unintelligible conversation]
00:57:36.6 EICAS	[sound similar to Master Caution]
00:57:46.4 CAM-?	shut up.
00:57:55.0 CAM	[sound similar to cell phone ring]
00:58:28.0 EICAS	[sounds similar to Master Cautions]
00:59:10.3 CAM	[sound similar to cell phone ring]
00:59:11.9 CAM-5	** you're down there...huh...[security code].
00:59:33.2 CAM	[sound similar to Republic Airways call menu]
00:59:57.6 CAM-?	***.

Time and Source	Intra-Aircraft Communication
01:00:01.6 CAM-3	[calls to MCC - discussed completing ops test, everything looking good, discussed signing off logbook, clearing MEL, if trim switch should be cut out with MEL. Said he will take picture (of logbook), leave cutout switch off. Call ended 01:09:48.5]
01:01:42.2 CAM-3	***...either way I'm gonna make them write this up... (turn it over) (the right way/correctly). [part of phone call]
01:10:05.9 CAM-3	are we good?
01:10:20.8 CAM-?	apparently this thing has had issues...that's why it's on M-E-L...so maybe if deferring the # thing is ***.
01:10:36.0 CAM-?	all right I'm gonna go **...you wanna push that maintenance bus.
01:10:39.8 CAM-?	** maintenance bus.
01:10:43.4 CAM-?	**...see the button that says maintenance bus?
01:10:48.4 CAM-?	uhh...ground service?
01:10:49.9 CAM-?	yeah.
01:10:50.6 CAM-?	yeah.
01:10:51.1 CAM-?	all right press that.

Time and Source	Intra-Aircraft Communication
01:10:51.3 CAM	[sound similar to power cycle]
01:24:00.2 CAM	[discussion among unidentified flight crew]
02:04:47.3 EICAS	[sound similar to Master Caution]
02:05:08.8 CAM-6	[call to MCC - discussed pulling FDR/CVR circuit breaker.]
0206:45.7	
END OF TRANSCRIPT END OF RECORDING	