



Aircraft incident report

C 3/1999 L

Aircraft incident in Helsinki TMA on 24 March 1999

Translation of the original report in Finnish

OH-LYY, DC-9-51

SE-KXY, Beech 1900 D

According to Annex 13 of the Civil Aviation Convention, paragraph 3.1, the purpose of aircraft accident and incident investigation is the prevention of accidents. It is not the aim of aircraft accident investigation or the investigation report to apportion blame or to assign responsibility. This basic rule is also contained in the Investigation of Accidents Act, 3 May 1985 (375/85) and European Union Directive 94/56/EC. Use of the report for purposes other than improvement of safety should be avoided.



CONTENTS

SYNOPSIS.....	3
1 FACTUAL INFORMATION	5
1.1 History of the incident	5
1.2 Basic information.....	6
1.2.1 Aircraft	6
1.2.2 Types of operations.....	7
1.2.3 Aircraft occupants.....	7
1.2.4 Crews and ATC personnel	7
1.2.5 Weather	8
1.3 Investigations	8
2 ANALYSIS.....	9
2.1 Actions by the controllers.....	9
2.2 Actions by FIN 387.....	11
2.3 Actions by GOT 603.....	12
3 CONCLUSIONS.....	13
3.1 Findings.....	13
3.2 Probable cause	14
4 RECOMMENDATIONS.....	15

APPENDICES

Other reference material is stored at the Accident Investigation Board, Finland.



SYNOPSIS

On Wednesday 24 March 1999 at 17.21 UTC (all times in this report are UTC times, Finnish local time -2 hours) there was an air traffic incident within Helsinki Terminal Control Area (TMA) near Vihti, in which the required minimum separation between two aircraft was lost.

Finnair DC-9-51, registered OH-LYY, call sign FIN 387, was departing from Helsinki while a Beech 1900 D operated by Air Express i Norrköping AB, registered SE-KXY, call sign GOT 603 was inbound to Helsinki. The aircraft were on intercepting flight paths, approaching each other without the required vertical separation.

The incident was duly reported by the captain of FIN 387 and by the on-the-job instructor who was working at ARR controller position.

The Accident Investigation Board, Finland appointed controller Erkki Rissanen to investigate the incident by decision no. C 3/1999 L.



1 FACTUAL INFORMATION

1.1 History of the incident

At the time of the incident, traffic in Helsinki TMA was normal and relatively quiet (compared with the average traffic density at the aerodrome). Three workstations were manned at the approach control: DEP, ARR and COR. At the DEP station was working a rated radar controller. ARR and COR stations were both manned by a trainee, who was working under the supervision of a rated radar instructor. Runway 22 was used for departures and runway 15 for landings.

FIN 387 departed for a scheduled passenger flight to Kajaani. It took off from runway 22 at 17.18 on a clearance: "Standard instrument departure TEN 1 E (Tenni 1 Echo)". According to this standard instrument departure route, which is published in the AIP, aircraft must turn right to a heading of 275 degrees and intercept Vihti VOR radial 114 when at 2.1 NM from Helsinki VOR/DME. When at 3 NM from Vihti VOR/DME, aircraft must turn right, intercept Vihti VOR radial 029 and fly to Tenni reporting point. Initial clearance level is FL 70. All standard instrument departure routes include an instruction to climb to at least 2000 ft as soon as practicable, as well as a request to contact Helsinki radar after take-off on 119,1 MHz.

GOT 603 was flying from Norrköping to Helsinki on a scheduled flight with a repetitive flight plan. It had entered Helsinki TMA via ATS route T6 and contacted COR on 129,85 MHz. It was assigned a heading of 045 degrees, and at 17.14 it was cleared to continue descent to FL 80. COR handed the aircraft over to ARR frequency 119,9 MHz at 17.17.

When reporting on ARR frequency at 17.17.50, GOT 603 stated to be maintaining flight level 80. ARR instructed the aircraft to continue on its present heading and maintain FL 80.

Having received instructions from the instructor at COR workstation, the ARR instructor told the trainee to clear GOT 603 to descend. At 17.19.10 the trainee cleared GOT 603 to descend to 3000 ft on QNH 1004. GOT 603 read back the clearance and left FL 80 about half a minute later. At that time, FIN 387 was climbing through 4000 ft and the distance between the two aircraft was 10 NM. The groundspeed of both aircraft was 233 kts and the flight path intersection angle about 110 degrees.

The DEP controller realized the situation immediately when GOT 603 left FL 80. At 17.20.00 he told FIN 387: "Three eight seven climb to flight level niner zero, expedite through seven zero". However, FIN 387 did not read back the clearance. At 17.20.10 DEP gave new instructions to FIN 387: "Three eight seven, left heading two seven zero". Again, FIN 387 did not acknowledge the clearance. As the controller saw on his radar display that it did not respond to the instructions either, he called the aircraft immediately again: "Finnair three eight seven do you read?" and at 17.20.20 once more: "Finnair three eight seven, radar calling". Since FIN 387 still did not respond to the radio call, the

controller transmitted blind the following instructions at 17.20.40: "Three eight seven, if you read me, turn left heading two seven zero".

The instructor at ARR workstation also saw the potential traffic conflict and advised the trainee to turn the inbound GOT 603 left, to the north. The trainee gave the instruction at 17.20.30: "Six zero three turn left heading three six zero". GOT 603 read back the instruction and initiated a left turn.

GOT 603 passed the flight path intersection point ahead of FIN 387, at a distance of 4.5 NM from it. GOT 603 was then at FL 69 descending and FIN 387 at FL 56 climbing. GOT 603 initiated the turn about 1.3 NM after the intersection point. At that time, the groundspeed of GOT 603 was 241 kts and that of FIN 387 was 263 kts. Both aircraft were at FL 63.

At 17.21.00, FIN 387 called the approach control: "Radar, iltaa (*evening*) Finnair three eight seven, approaching level seven zero". The controller replied: "Left heading two seven zero, immediately". However, the monitoring pilot of FIN 387 misunderstood the message, and as the aircraft was then on a heading of about 295 degrees, he asked the controller to confirm the heading: "Heading three two zero, confirm, Finnair three eight seven". The controller gave new instructions: "Left two five zero now". FIN 387 acknowledged the new heading and initiated a left turn at 17.21.25. During the turn, FIN 387 passed through the actual flight path of GOT 603.

The shortest distance between the aircraft was 2.3 NM. While FIN 387 was turning left, the distance between the aircraft started to increase at 17.21.35 and the required minimum horizontal separation of 3 NM was reached immediately after the turn was initiated.

Having ascertained that any risk of collision no longer existed, ARR gave GOT 603 a new heading of 075 degrees, whereafter the aircraft continued the approach as usual.

At 17.22.30, DEP issued FIN 387 a further clearance to climb to FL 250 and turned it to the correct heading of 360 degrees.

1.2 Basic information

1.2.1 Aircraft

GOT 603

Type: Beech 1900 D.

Manufacturer: Beech aircraft Corporation.

Owner: ABM Amro Leasing, Stockholm.

Operator: Air Express i Norrköping Ab. Norrköping.

The aircraft held a valid Certificate of Airworthiness.

The aircraft was not equipped with Traffic Alert and Collision Avoidance System (TCAS).



FIN 387

Type: DC-9-51.

Manufacturer: MC Donnell Douglas Corp.

Owner and operator: Finnair Oyj.

The aircraft held a valid Certificate of Airworthiness.

The aircraft was not equipped with Traffic Alert and Collision Avoidance System (TCAS).

1.2.2 Types of operations

GOT 603 was on a scheduled flight from Norrköping to Helsinki in accordance with a repetitive flight plan. FIN 387 was flying a scheduled flight from Helsinki to Kajaani in accordance with a repetitive flight plan.

1.2.3 Aircraft occupants

There were 4 persons on board in GOT 603, of which 2 were crewmembers. FIN 387 had 111 passengers and 5 crew.

1.2.4 Crews and ATC personnel

FIN 387

Captain

Female, age 40 years (born 1958).

Licence: Airline transport pilot's licence, valid until 6 October 1999.

Ratings: All ratings required for the duties were valid.

Total flying experience: about 7900 hours.

First officer

Male, age 29 years (born 1969).

Licence: Commercial pilot's licence, valid until 9 January 2000.

Ratings: All ratings required for the duties were valid.

Total flying experience: about 2600 hours.

ATC personnel

COR workstation

On-the-job instructor.

Male, age 50 years (born 1948).

Licence: Air traffic controller's licence, valid until 12 October 1999.

Ratings: All ratings required for the duties were valid.

Radar trainee.

Male, age 37 years (born 1961).

Licence: No valid licence. Licence expired on 29 January 1999.

Ratings: No valid ratings. Has earlier held both Helsinki approach and Terminal Area Surveillance Radar (TAR) ratings. Was receiving on-the-job training for a radar rating.

ARR workstation

On-the-job instructor.

Female, age 38 years (born 1961).

Licence: Air traffic controller's licence, valid until 24 March 2000.

Ratings: All ratings required for the duties were valid.

Radar trainee.

Male, age 31 years (born 1967).

Licence: Air traffic controller's licence, valid until 9 December 2000.

Ratings: Valid Helsinki aerodrome control (TWR) rating. Satisfactorily completed RSR/TAR course 32/98 and was receiving on-the-job training for a radar rating.

DEP workstation

Male, age 47 years (born 1952).

Licence: Air traffic controller's licence, valid until 24 September 1999.

Ratings: All ratings required for the duties were valid.

1.2.5 Weather

Weather at Helsinki-Vantaa at 17.20:

Wind 180 degrees 4 knots, variable 80 - 220 degrees.

Visibility over 10 kilometres.

Clouds: broken (5-7/8) 700 ft, broken 2700 ft.

Temperature 0, dewpoint -2°C.

QNH 1005 hPa.

The incident occurred at flight level 70 above clouds 15 NM from Helsinki-Vantaa airport. According to the pilots, visual meteorological conditions prevailed.

1.3 Investigations

Investigations have been limited to those parties directly involved in the incident.

Source material includes interviews, as well as recordings of Helsinki approach control radio communications and radar recordings from Tampere Area Control Centre.

2 ANALYSIS

2.1 Actions by the controllers

Helsinki approach control was manned according to the shift list. DEP workstation was manned by an appropriately rated radar controller, while the controllers at COR and ARR workstations were receiving on-the-job training under the supervision of rated instructors to obtain a radar rating.

The approach control office is equipped with four radar displays. At the time of the incident, three from the left were used by controllers and the one farthest right by the assistant. The order of workstations from left to right was: ARR, COR and DEP. Distances between the workstations were ARR - COR 1,2 m and COR - DEP 1,8 m.

One of the trainees was sitting in front of the ARR display and the instructor was on his left side. The other trainee was sitting in front of the COR display and his instructor was on his left side, between him and the trainee at ARR workstation. The radar controller was sitting in front of the DEP display. Considering the short distance between radar displays, there is not much working space when trainees are also present.

Telephones are not used for exchanging information between workstations, since their use is regarded as slow and inconvenient. As the workstations are closely located, the controllers can exchange information simply by shouting to each other, which is seen as a rapid and flexible means of communication. However, the short distance between workstations causes some background noise, which is eliminated by using headsets. During the incident now under investigation, all five controllers were using headsets. On the other hand, use of headsets forces the controllers to raise their voices when talking to each other, which in turn increases the noise level. Loud background noise, together with radio communications heard at the same time via headsets, creates a situation in which messages are easily misunderstood.

Telephone conversations between workstations are taped, but there is no voice recorder in the approach control office for recording the controllers' direct verbal communications. Therefore the wordings of controllers' remarks used in this investigation are as stated by them in the interviews (*and translated into English for the purpose of this report*).

According to the official division of tasks in the approach control, COR workstation should co-ordinate the operation of DEP and ARR workstations between inbound and outbound traffic. In practice, however, during hours of peak traffic activity, the COR controller is often so busy resolving acute conflicts that he has not enough time to anticipate developing situations. Therefore DEP and ARR controllers exchange information by shouting to each other over the COR workstation.

As a general rule, DEP controller takes care of outbound traffic independently using a standardized procedure. At the time of the incident, the DEP controller was co-ordinating the traffic situation by speaking with the COR trainee. The trainee was actually an

experienced controller, who was handling the traffic rather independently although he had no valid ratings.

Inbound traffic is first handled by the COR controller, who hands the aircraft over to the ARR controller after they have been released. If an aircraft is released subject to some conditions, the COR controller must state them specifically. Flight information is conveyed from COR to ARR by passing flight progress strips on to the next workstation and verbally.

When FIN 387 took off from runway 22 on a clearance "Tenni 1 E", the COR instructor estimated that its flight path would pass clearly behind GOT 603. The inbound GOT 603 had already been handed over to the ARR workstation.

Ahead of FIN 387 there was another aircraft departing westbound, which was on intersecting flight path with an inbound aircraft flying behind GOT 603. The DEP controller and COR trainee had agreed that the aircraft behind GOT 603 would first be cleared only to FL 100 and the outbound aircraft would be cleared to FL 90 after passing GOT 603. Speaking of the positions and flight levels of these aircraft, the COR trainee asked the DEP controller: "Did you raise it?" and DEP replied "Yes, you can take down".

The COR instructor was monitoring the situation between FIN 387 and GOT 603, and as he overheard the discussion, he thought that it was about those aircraft. He then said to the ARR instructor: "Take down, the other has been raised".

All controllers recalled that aircraft call signs were never used when the controllers spoke directly to each other, but the wordings were more like "It has been raised. Take it down".

ARR instructor advised the trainee to take GOT 603 lower. The trainee did as he was told and cleared GOT 603 to descend to 3000 feet.

The DEP controller detected the potential traffic conflict when GOT 603 had left FL 80, and he instructed FIN 387 to climb to FL 90 and expedite through FL 70 at 17.20.00.

Based on ICAO recommendations contained in the Finnish Manual of ATC Instructions, Chapter V, paragraph 2.3.1, an aircraft is considered having left a flight level when mode C display shows a change greater than 90 m (300 ft).

As the DEP controller did not receive any answer despite several calls, and the radar display did not show FIN 387 to respond to the instructions, he told the other controllers that radio contact was missing. The controller had not previously noticed that there was no radio contact, since he did not have anything to transmit to the departing aircraft earlier.

In Helsinki approach and aerodrome control, flight progress strips are not handled in accordance with the procedure taught in controllers' basic training. In that procedure, the location of the strip indicates under which ATC unit's responsibility and on which unit's radio frequency each aircraft is. The data strip for a departing aircraft is under the runway designator or another unit's designator, until the aircraft reports on the relevant



unit's frequency. If the system taught in basic training had been used, it would have shown to the DEP controller that FIN 387 had not reported on its frequency.

The COR controller did not know that radio contact to FIN 387 was missing, and he did not react to the situation as neither of the aircraft was on his frequency.

The instructor at ARR workstation saw the traffic conflict before she heard about the missing radio contact, and advised the trainee to turn GOT 603 to the left, onto a heading of 360 degrees. The trainee had not responded to the situation himself, but when advised, he instructed GOT 603 to turn left to a heading of 360 degrees at 17.20.30. However, the instruction was given so late that GOT 603 passed through the cleared flight path of FIN 387 before the turn was initiated.

The new heading was assigned to resolve an acute traffic conflict, and it did not take account of the cleared flight path of FIN 387. At that time, FIN 387 was flying a heading of 295 degrees, but when at 3 NM from Vihti VOR/DME it was to turn right and intercept Vihti VOR radial 029. As a consequence, the two aircraft would again be on intersecting flight paths. The instructor had not observed the respective speeds of the aircraft: GOT 603 was slowing down and FIN 387 accelerating.

Immediately after establishing radio contact with FIN 387, the DEP controller instructed it to turn left, first to a heading of 270 degrees and then 250 degrees. However, the instructions came so late that FIN 387 passed through the actual flight path of GOT 603 during the turn.

2.2 Actions by FIN 387

FIN 387 took off from runway 22 at 17.18 in accordance with its normal en-route clearance. Initial clearance included Standard Instrument Departure route Tenni 1 E. Both pilots were familiar with the route and knew the instruction associated with all standard instrument departures: "When airborne contact Helsinki radar on 119,1 MHz".

After take-off there was a cloud layer at 1000 ft. Based on pre-flight weather information and reported temperatures and dewpoint, the pilot flying estimated that they might encounter icing conditions in the cloud. He asked the monitoring pilot to switch on the deicing system, which she did. However, the cloud layer was thin and no icing was found. Therefore the pilot flying advised the monitoring pilot to switch off the deicing system, which she again did.

Switching the deicing system on and off was accomplished at the exact time when, routinely, radio frequency is changed and the new ATC unit contacted.

The crew had already flown several short flights during the same day, which easily causes many functions to become fully routinized. In such conditions, even a small deviation from normal, almost mechanical duties may disturb the chain of actions.

Cockpit procedures include that the monitoring pilot reports "One to go" 1000 ft before the cleared flight level is reached. At that stage, both pilots noticed that the required frequency change had not been accomplished.

Radio traffic on the tower frequency, where the aircraft still was, had been so quiet during those 2 - 3 minutes that neither of the pilots realized that they had the wrong frequency.

Immediately after the wrong frequency had been noticed, the monitoring pilot changed over to the preselected radar frequency and reported at 17.21.00 that FIN 387 was approaching FL 70. The monitoring pilot misunderstood the controller's reply: "Left heading two seven zero, immediately" and asked him to confirm: "Heading three two zero, confirm?" When the controller gave a new heading: "Left two five zero now" the monitoring pilot read back the clearance correctly and the pilot flying initiated a left turn.

Because of the delays, FIN 387 passed through the actual flight path of GOT 603.

When the controller asked at 17.21.10: "Have you got something wrong with your radio, I have been calling you several times?" the monitoring pilot replied "No, I just wasn't pressing the right buttons, I'm very sorry". The controller then reported: "Well, there was Gothic near you, on the right side, you probably saw it too" and the monitoring pilot replied: "Yes, we had the traffic in sight and we are on level seven zero now". (*The above conversation was in Finnish and has been translated into English for the purpose of this report*).

After the conflict had been resolved, the controller cleared FIN 387 to continue the climb, turning it first to the north and then on to its intended route.

The rest of the flight was uneventful.

2.3 Actions by GOT 603

GOT 603 flew in accordance with its ATC clearance and was not aware of the traffic conflict. FIN 387 was on a different radio frequency. When FIN 387 was within the normal field of vision of GOT 603 crew, it was flying far below GOT 603. By the time FIN 387 climbed to the same flight level, it was out of GOT 603 crew's field of vision on their right side.

3 CONCLUSIONS

3.1 Findings

1. All pilots held valid licences and ratings.
2. The controllers responsible for the operations had valid licences and appropriate ratings.
3. COR and ARR workstations were manned by trainees, who were working under the supervision and responsibility of on-the-job instructors.
4. Instructions concerning air traffic control operations were current and adequate.
5. Both aircraft had valid Certificates of Airworthiness.
6. The incident occurred in visual meteorological conditions.
7. FIN 387 crew had the essential traffic in sight.
8. GOT 603 crew was not aware of the traffic conflict.
9. Both aircraft were flying in accordance with their ATC clearances.
10. ATC clearances should be such that minimum separation between all aircraft under ATC's separation responsibility is ensured even in case of radio malfunctions.
11. FIN 387's radio contact with approach control was delayed because of the monitoring pilot's mistake.
12. The instructor at COR workstation misinterpreted a message he overheard from the other controllers' discussion.
13. Aircraft call signs were not used in direct verbal communications between workstations.
14. The instructor at COR workstation advised the ARR controller to clear GOT 603 to descend before the flight path intersection point.
15. The controllers at the approach control office aim at being flexible in traffic handling and deviate from standard procedures.
16. The data strip handling system taught in controllers' basic training is not used.
17. ATC instructions for maintaining separation were given so late that GOT 603 only initiated the turn 1.3 NM after intersecting FIN 387's cleared flight path and FIN 387 intersected the actual flight path of GOT 603 during the turn.



18. The aircraft lost the required minimum separation for about 20 seconds. The closest proximity between the two aircraft was 2.3 NM.

3.2 Probable cause

The incident was caused by misinterpretation of a message between COR and DEP workstations at the approach control office. The reason for the misinterpretation was inadequate wording of the message.



4 RECOMMENDATIONS

Special attention should be paid to the exchange of messages between workstations within air traffic control units.

Helsinki 8 November 1999.

Erkki Rissanen

LIST OF APPENDICES

Reference material

The following material is stored at the Accident Investigation Board, Finland:

1. Decision of the Accident Investigation Board No. C 3/1999 L, dated 31 March 1999.
2. Recordings of Helsinki approach control radio communications on the frequencies 119.1, 119.9 and 129.85 MHz.
3. Incident reports (2).
4. Controllers' PHI report (occurrence and observation report) and associated debriefing records.
5. ATC data strips.
6. Helsinki-Vantaa weather information for the time of the incident.
7. Radar recording from Tampere Area Control Centre.

Incident C 3 / 1999 L, radio communications transcript 24 March 1999

Recording of Helsinki approach control radio communications on 119.1 MHz.

All times are UTC.

Time	Source	Content
17.20.00	APP	Three eight seven climb to flight level niner zero, expedite through seven zero.
17.20.10	APP	Three eight seven, left heading two seven zero.
	APP	Finnair three eight seven, do you read ?
17.20.20	APP	Finnair three eight seven, radar calling.
17.20.30	APP	Finnair three eight seven, radar calling.
17.20.40	APP	Three eight seven, if you read me, turn left heading two seven zero.
17.21.00	FIN 387	Radar, iltaa (<i>evening</i>) Finnair three eight seven, approaching level seven zero.
	APP	Left heading two seven zero immediately.
	FIN 387	Heading three two zero, confirm, Finnair three eight seven.
	APP	Left two five zero now.
	FIN 387	Left two five zero, Finnair three eight seven.
17.21.10	APP	Onks sulla radios jotain häikkää, mä oon sua kutsunu lukuisia kertoja? (<i>Have you got something wrong with your radio, I have been calling you several times?</i>)
	FIN 387	Joo, oli ihan nappulatekniikkaa, hyvin paljon anteeksi. (<i>No, I just wasn't pressing the right buttons, I'm very sorry.</i>)
17.21.20	APP	Joo siin oli Got'ikki teiän lähellä siinä oikeella puolella, varmaan näittekin. (<i>Well, there was Gotic near you on the right side, you probably saw it too.</i>)
	FIN 387	Joo liikenne oli näkyvissä kyllä. Ja meillä on pinta seitsemän nolla nyt, kolme kaheksan seittemän. (<i>Yes, we had the traffic in sight. And we are on level seven zero now, three eight seven.</i>)
17.21.30	APP	Säilytä. (<i>Maintain.</i>)
17.22.30	APP	Finnair three eight seven, now climb to flight level two five zero.
	FIN 387	Climb flight level two five zero, Finnair three eight seven.

APP Three eight seven, right turn heading three six zero.

FIN 387 Right heading three six zero, Finnair three eight seven.

17.24.10 APP Finnair three eight seven, now own navigation direct Tenni.

17.24.20 FIN 387 Own navigation direct Tenni, Finnair three eight seven.

17.29.40 APP Finnair three eight seven, contact Tampere one three two three two.

FIN 387 Tampere one three two three two and sorry about the trouble we caused, Finnair three eight seven.

APP Okay.

Recording of Helsinki approach control radio communications on 119.9 MHz.
All times are UTC.

17.17.50 GOT 603 Hello, good evening, Gotic six zero three, flight level eight zero.

17.18.00 APP Gotic six zero three, radar contact, continue present heading, maintain flight level eight zero.

GOT 603 Okay, continue present heading, eight zero, six zero three.

17.19.10 APP Six zero three, descent to three thousand feet, QNH one zero zero four.

17.19.20 GOT 603 Three thousand feet, QNH one zero zero four, six zero three.

17.19.30 APP Radar.

17.20.30 APP Six zero three, turn left heading three six zero.

GOT 603 Left heading three six zero, six zero three.

17.20.40 APP Radar.

17.21.20 APP Six zero three, turn right heading zero seven five.

GOT 603 Right zero seven five, six zero three.

17.21.30 APP Radar.

17.22.10 APP Six zero three, continue descent to two thousand feet.

GOT 603 Two thousand feet, six zero three.

17.22.20	APP	Six zero three, turn more right, heading one zero zero.
	GOT 603	Right one zero zero, six zero three.
	APP	Radar.
17.23.00	APP	Six zero three, turn right heading one two zero, cleared ILS approach runway one five, one zero miles to touchdown, report localiser established.
17.23.10	GOT 603	Right turn one two zero, cleared for approach, will call you established, Gotic six zero three.
17.25.10	GOT 603	Gotic six zero tree, established.
17.25.20	APP	Six zero three, three decimal five miles, contact tower one one eight six.
	GOT 603	Tower one one eight six, six zero three.

Recording of Helsinki approach control radio communications on 129.85 MHz.
All times are UTC.

17.11.20	GOT 603	Helsinki, good evening. Six zero three. One five five, descending to one five zero. Information kilo.
17.11.20	APP	Good evening, Gotic six zero three. Stand by. Finnair one niner three four, contact Arrival one one niner niner.
17.11.30	FIN 1934	One one niner niner, Finnair one niner three four.
17.11.40	APP	Gotic six zero three, radar contact, fly heading zero five five, continue descent to flight level one zero zero, vectoring ILS approach runway one five righthand circuit, six zero track miles, number four.
17.12.00	GOT 603	Heading zero five five, descending to flight level hundred, runway one five righthand circuit, number four in traffic, six zero three.
	APP	Gotic six zero three.
17.12.30	APP FIN 358	Three five eight contact Arrival one one niner desimal niner. Nineteen niner, terve (<i>hello</i>).
17.14.40	APP	Gotic six zero three turn left heading zero four five for a while, continue descent flight level eight zero.

17.14.50	GOT 603	Left heading zero four five and descending to eight zero, Gotic six zero three.
17.15.00	APP	Radar.
17.15.30	FIN 664	Radar iltaa, Finnair six six four, DC niner, two three five down to flight level one five zero.
17.15.40	APP	Finnair six six four, good evening, radar contact, fly heading zero five zero, continue descent flight level one zero zero, vectoring ILS one five right circuit, six five track miles, number five.
17.16.00	FIN 664	Heading zero five zero, down to one hundred vectors for ILS one five, Finnair six six four.
	APP	Radar.
17.16.10	FIN 368	Ja Radar iltaa Finnair three six eight, just leveling one four zero, airbus, request one kilo weather.
17.16.20	APP	Iltaa Finnair three six eight, radar contact, fly heading two zero zero, continue descent flight level eight zero, vectoring ILS-approach one five left circuit, five zero track miles, number six.
17.16.40	FIN 368	Okei, three six eight, heading two hundred flight level eight zero, vectoring for one five.
	APP	Radar.
17.16.50	APP	Finnair six six four, reduce speed two three zero knots.
17.17.00	FIN 368	Speed two three zero, Finnair three six eight.
	APP	Radar.
	FIN 508	Good evening, Finnair five zero eight, ATR, we are just leaving one eight zero one four zero with Kilo.
17.17.10	APP	Good evening Finnair five zero eight, radar contact, follow Orima two zero arrival for runway one five.
	FIN 508	Orima two zero one five Finnair five zero eight.
	APP	Radar.
17.17.30	APP	Gotic six zero three, contact Arrival one one niner desimal niner.
	GOT 603	One one niner niner, Six zero three, bye bye.
17.17.40	APP	Bye.