MINISTERE DE L'EQUIPEMENT DES TRANSPORTS ET DU LOGEMENT - BUREAU D'ENQUETE ET D'ANALYSES POUR LA SECURITE DE L'AVIATION CIVILE - FRANCE

BEA

Report
on the incident to the Emirates A300-600
registered A6-EKO on July 30 1997
at Paris Charles De Gaulle (95)

REPORT

a6-o970730a

F O R E W O R D

This report presents the technical conclusions reached by the BEA on the circumstances and causes of this incident.

In accordance with Annex 13 of the Convention on International Civil Aviation, with EC directive 94/56 and with Law N° 99-243 of 29 March 1999, the analysis of the incident and the conclusions and safety recommendations contained in this report are intended neither to apportion blame, nor to assess individual or collective responsibility. The sole objective is to draw lessons from this occurrence which may help to prevent future accidents or incidents.

Consequently, the use of this report for any purpose other than for the prevention of future accidents could lead to erroneous interpretations.

SPECIAL FOREWORD TO ENGLISH EDITION

This report has been translated and published by the BEA to make its reading easier for English-speaking people. As accurate as the translation may be, please refer to the original text in French.

S Y N O P S I S

Date and time
30 July 1997
at 13 h 54[1]

Site of accident
Roissy Charles de Gaulle Airport
France

Type of flight
Public transport (passengers and cargo)

Flight number : Emirates 024

Aircraft
A300-600
Registration A6-EKO

Owner
Leasing Limited
Cayman Islands

Operator
Emirates Airline
Dubai

Persons on board
220 Passengers
14 Crew

Summary

Due to an error in load calculation, the aircraft was loaded with a rear center of gravity well beyond the authorized limit. During acceleration for take-off, the aircraft pitched up at slow speed and its tail touched the ground. The pilot then abandoned the take-off.

Consequences

	PERSONS			EQUIPMENT	THIRD PARTIES
	KILLED	INJURED	UNINJURED		
CREW	-	-	14	Structural Damage	None
PASSENGERS	-	-	220*		

* including 7 babies

[1] All times in this report are UTC, except where otherwise specified. Two hours should be added to express local official time in metropolitan France on the day of the accident.

1 - FACTUAL INFORMATION

1.1 History of the Flight

On 30 July 1997, the Airbus A300-600 registered A6-EKO was undertaking the scheduled Paris Charles de Gaulle to Dubai flight under the operational call sign “Emirates 024”. During takeoff, as the aircraft was accelerating at 40 knots, it pitched up and its tail touched the ground violently. The crew abandoned the take-off and returned to the parking area.

During the center of gravity calculations, made with the aid of a computer system, an incorrect value had been recorded. This had led to the aircraft being loaded and fuel being transferred so as to produce an actual center of gravity (CofG) well aft of the maximum limit authorized by the manufacturer.

1.2 Injuries to Persons

Nobody on the aircraft or on the ground was killed or injured.

1.3 Damage to Aircraft

The tail of the aircraft was damaged due to the impact with the runway when the plane pitched up.

1.4 Other Damage

None.

1.5 Personnel Information

1.5.1 Captain

- Male, 38 years,
- License : Airline Transport Pilot's License number 0032 issued on 28 February 1988 by the Civil Aviation Authority of the United Arab Emirates and valid until 31 January 1999,
- Type Rating on A300-600 obtained on 28 April 1989,
- Flying Experience : **on all types of aircraft** 9,096 ; **on A300-600 and A310** 5,238,
- Employed by Emirates since 15 May 1987.

1.5.2 First Officer

- License : Airline Transport Pilot's License number 3009 issued by the Civil Aviation Authority of the United Arab Emirates and valid until 12 June 1998,
- Type Rating on A300-600 obtained on 13 June 1994,
- Flying Experience : **on all types of aircraft** 9,250 ; **on A300-600 and A310** 2,153,
- Employed by Emirates since 22 April 1994.

1.5.3 Ground Agent

- Ground Agent : Female, aged 34 years, employed by Aéroports De Paris, (ADP),
- Authorization No. 925 to produce weight and balance documents, issued on 14 September 1992 by Emirates for A300-600R, A310-300 and B777-200. Valid until 18 September 1998,
- Appointed by Emirates to train and test ADP personnel responsible for handling that company's aircraft at Charles-de-Gaulle Airport.

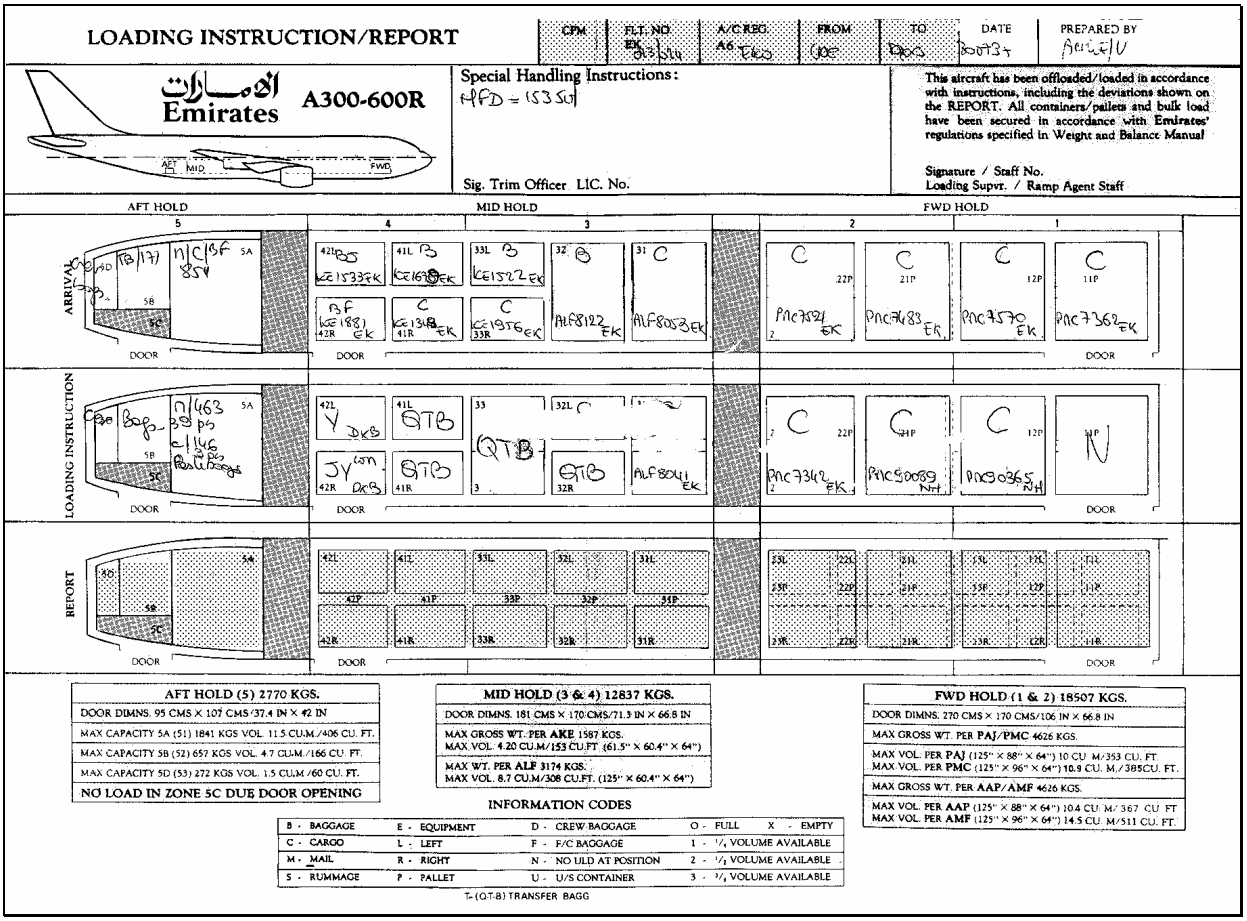
Note : Ground Agents make out the weight and balance calculations and develop the hold loading plan. This qualification also allows the Ground Agent to supervise loading and unloading operations. The Ground Agent does not perform both functions for a given flight.

1.6 Aircraft Information

1.6.1 Airframe

Airbus A300-600R, constructor 's number 747.

The aircraft is configured to carry 216 passengers. Under the passenger cabin, the forward hold is equipped to carry four cargo pallets, (or twelve containers or a combination of the two), the mid hold is equipped to carry five pallets, (or ten containers or a combination of the two), and the aft hold is equipped to carry bulk cargo. The maximum authorized weight for each zone and type of pallet or container is shown on the loading instruction report which is reproduced below :



The aircraft is equipped with a fuel trim tank, which allows the aircraft CofG to be modified, both on the ground and in the air, by transferring fuel (maximum 6,150 liters, equal to 4,809 kg at a specific gravity of 0,782) from the center tank. On the ground, transfer is managed by the flight crew manually ; in flight it is managed by an automatic system, in conjunction with the Center of Gravity Control Computer (CGCC).

The maximum authorized aircraft takeoff weight is 171,700 kgs. The aft limit of aircraft CofG at the maximum authorized takeoff weight is 34.7 percent mean aerodynamic chord (MAC).

1.6.2 Center of Gravity

1.6.2.1 Loadsheet Information

The loadsheet given to the crew indicated :
- Take-off weight of 170,257 Kg,
- Center of gravity at take-off : 33.0% MAC.

The process by which the loadsheet was prepared, in the case of the incident flight, is detailed in paragraph 1.16.

1.6.2.2 Actual Aircraft Center of Gravity

After the incident, all pallets and containers from the aircraft were kept until they were weighed again in the presence of a representative from the Bureau Enquêtes-Accidents. The weights of these pallets and containers corresponded, within acceptable limits, to the weights recorded on the loading documents. The passenger baggage had been weighed at check-in, and it was returned to passengers without being weighed again.

The Bureau Enquêtes-Accidents could not recalculate the exact weight of the aircraft as the actual number of adult males, (average 75 Kg), adult females, (average 65 Kg), or children, (average 38 Kg), on board was not known.

The Center of Gravity was recalculated manually using the weight and balance chart and the true index at the time of take-off was found to be 147.

1.7 Meteorological Information

Meteorological conditions played no part in the incident.

1.8 Aids to Navigation

Not relevant.

1.9 Communications

Shortly before the aircraft left the runway after the acceleration and stop, the pilot of another aircraft told the Controller, in French : “Yes, apparently the tail of the A300 touched the runway”.

The investigation could not establish why this information was not relayed to the crew of A6-EKO.

1.10 Airdrome Information

Not relevant.

1.11 Flight Recorders

1.11.1 CVR

The aircraft was equipped with a Sundstrand type AV557 Cockpit Voice Recorder (CVR), with a recording time of 30 minutes. Its readout presented no problems.

The recording begins when the engines were started. The part of the recording prior to takeoff requires no comment.

The transcript covers the period between the engine startup and the time the aircraft left the runway. It is included in appendix 1.

After application of engine power, the Captain is heard to abandon the take-off and ask "what is it?"

The Air Traffic Controller asked the crew if there was a problem. They replied that there was, without giving any details, and requested a return to the parking stand.

The Controller then asked if they needed the emergency services. The crew answered in the negative and that there was a small problem with climb thrust.

Forty seconds later, an Air France aircraft called the Controller and said (in French) "Yes, apparently the tail of the A300 touched the runway."

The crew of A6-EKO did not react to this radio call (either by radio or in the cockpit). When they radioed that they had cleared the runway, the Controller just answered "Roger".

During the return to the parking area, the Captain asked a member of the Cabin Crew if there were any problems in the cabin and the two pilots then discussed the incident several times, mentioning either a trim problem or a loading discrepancy.

1.11.2 FDR

The aircraft was equipped with a Sundstrand type 980-4100 DXUS Flight Data Recorder (UFDR).

An attempt was made to read out the data directly without opening the recorder, but parts of the recording were of very poor quality on several tracks, including those containing data relevant to the incident.

The recorder was then opened and the magnetic tape extracted. Loose particles from a worn drive belt were detected inside.

The tape was installed on a special player and the recording was then read out without difficulty.

The following parameters were noted :

- The brakes were released after engine N1 stabilized at 70%,
- After the brakes were released, engine N1 increased again,
- Once the CAS reached 40 Kt and N1 reached 105%, the pitch attitude began to increase,
- Take-off was abandoned (throttles closed) as the pitch angle increased to 6°,
- The pitch angle reached a maximum of 11° and the CAS reached 74 Kt,

- The pitch angle returned to 0° ten seconds after it had begun to increase.

Note : A CofG parameter is recorded but is usable only when the aircraft is in flight.

1.12 Wreckage and Impact Information

The following aircraft damage was found :

- some deformation of the lower part of frame 77, (the tail skid is attached at frames 76 and 77),
- deformation of stringers 47 and 48 at frame 77.
- rupture of a composite reinforcement strut at frame 77.
- several sheared rivets on the fuselage skin.
- fuselage skin abrasion, (with a reduction in skin thickness) on the lower part at frames 72 and 77.
- skin deformation between stringers 38 and 50 at frame 77

1.13 Medical and Pathological Information

Not relevant.

1.14 Fire

Not relevant.

1.15 Survival Aspects

The incident did not cause any damage in the cabin. When the aircraft returned to the gate the passengers disembarked.

1.16 Tests and Research

1.16.1 Description of the GAETAN System

1.16.1.1 General Description

GAETAN is a computerized information system developed by Air France. It includes many applications such as follow-up of aircraft maintenance, processing of passenger on a flight and aircraft loading.

Many airlines use this system and ADP uses it to provide ground handling services for many companies.

For the purposes of this report, only the application related to aircraft loading is mentioned.

From a practical point of view, the system has the recorded data necessary for the calculation of the weight and balance of each aircraft, and displays screens formatted with a standard operational configuration of the aircraft, (number of crew, pantry configuration...), which allow the Ground Agent to enter data specific to the flight, loads on board and their distribution.

The Ground Agent initializes flight processing by entering the aircraft registration, the date and the flight number. He or she then updates the operational configuration of the aircraft to take into account any possible differences compared to the standard.

Entering a different configuration does not change the basic weight and balance index, and in addition the Ground Agent cannot enter differences relative to the standard. The Ground Agent has to manually recalculate the basic weight and balance index for the flight aircraft configuration each time that it differs from the standard.

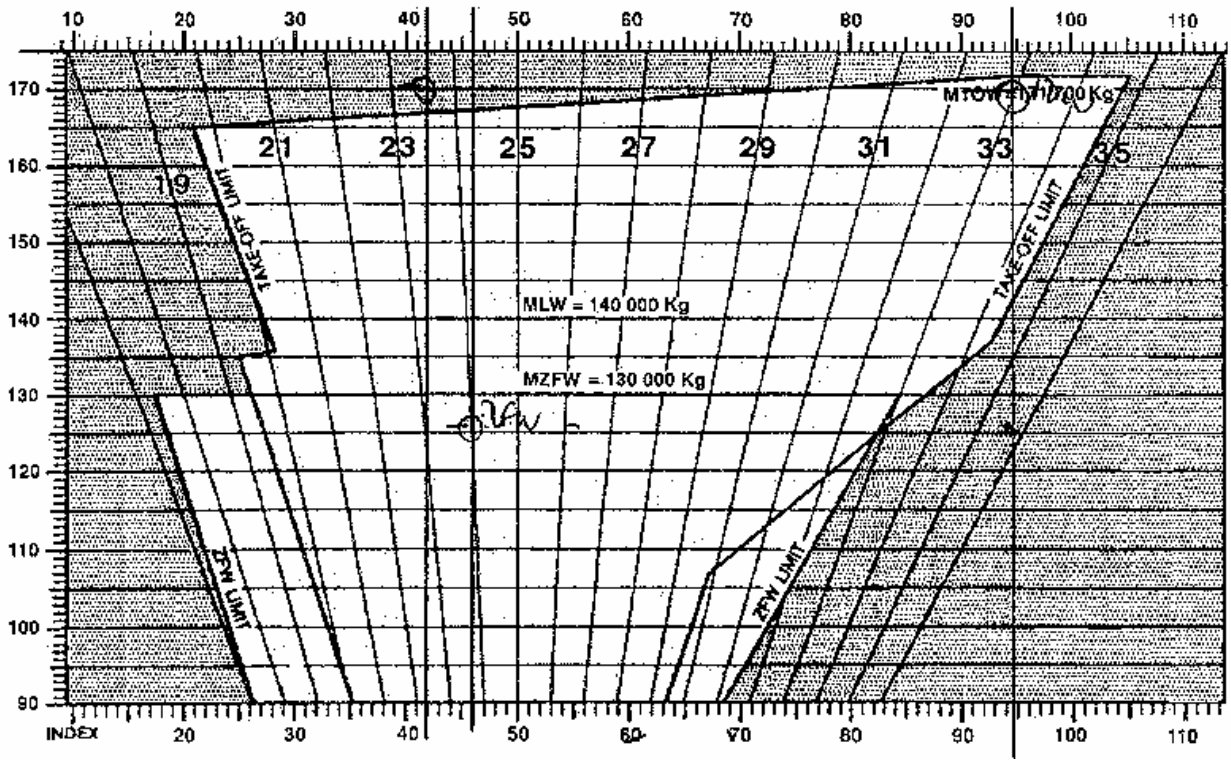
The number and distribution of passengers is transmitted directly to the system from the check-in counters.

The Ground Agent has no action to take relative to the distribution of passengers ; all pertinent weight and balance calculations are automatically performed by GAETAN.

The GAETAN system receives, via data link, the reference, type and weight of each container or pallet, (hereafter referred to only as “container”). The Ground Agent enters the weight of the bulk freight loaded in the aft hold.

The Ground Agent then decides on the position each container in the holds. At this stage, the GAETAN system’s only role is to calculate the balance of the aircraft ; it does not provide any assistance with the distribution of containers. This operation therefore depends entirely upon the experience of the Ground Agent and several attempts can be required to obtain a result within the permitted limits of weight and balance.

Note : Emirates aircraft often carry a lot of cargo and operate at take-off weights close to the maximum permitted. In such cases, the permitted range of CofG is much reduced and close to the aft limit :



As a result of these loading constraints, the aircraft CofG after loading is often (see paragraph 1.16.5) forward of the authorized limit. In such cases, the Ground Agent takes this initial figure and manually calculates how much fuel needs to be transferred to the aft trim tank to achieve a take-off center of gravity within the permitted range.

1.16.2 Remarks about the GAETAN System

a) Possible variations in the weight and balance index due to aircraft configuration :

The Accident Investigation Bureau examined the variations in the weight and in the balance index according to the composition of the crew and the pantry configuration.

Excluded from this study are non-passenger carrying flights, flights without cabin crew or without a pantry because they do not correspond to normal commercial operations. However, no check was performed as to whether the weight and balance figures for each configuration were always realistic.

Taking this into account, it was found that the range of aircraft empty weight and index values (DOW an DOI) can vary between the following values :

94,552 Kg* < DOW < 95,848 Kg**

* 2 Flight Crew / 8 Cabin Crew - Pantry code F

** 2 Flight Crew / 13 Cabin Crew - Pantry code B

48.5* < DOI <54.4**

* 4 Flight Crew / 11 Cabin Crew - Pantry code A

** 2 Flight Crew / 13 Cabin Crew - Pantry code B

The basic version of GAETAN does not automatically modify weight and balance index when the crew composition or the pantry configuration is modified in relation to the standard.

This possibility is an optional extra and Aéroports de Paris integrated it into the handling program for certain airlines (Singapore Airlines, for example). This option was not integrated into the version of the program used by Emirates for reasons of logistics and personnel training.

b) Fuel transfer to the aft trim tank.

The GAETAN system does not allow for the inclusion of the transfer of fuel to the aft trim tank to modify the center of gravity.

c) GAETAN System Warnings

GAETAN displays warnings when certain necessary actions have not been carried out or when certain results do not correspond to the specifications in the system memory.

Below are some cases relating to the event under study :

- A computer file cannot be initialized unless the Ground Agent enters the aircraft code, the date and the flight number.

- If the Ground Agent changes the number of crew members or the pantry configuration from the standard configuration a warning : “Warning, correct DOW/DOI of the crew weight”, flashes at the bottom of the screen to ask the Ground Agent to modify these values on the second screen. However, simply switching to the second screen, even if no alterations are made to the values, is enough to make the warning message disappear.

- If the aircraft weight, or balance, or the loading of a particular zone are outside the authorized limits, a message “Warning it is a display screen not a loadsheet” appears in English on the screen.

The operator can identify the reason for these messages more precisely by calling up a specific screen.

This warning cannot be removed without the correcting discrepancy.

Moreover, it is not possible to print the loadsheet without the warning message. The Ground Agent can only make a screenprint on which the warning appears. (See Para. 1.16.4).

1.16.3 Applicability to the incident. flight

The above observations were made from a study of the flight folder, from paper documents and computer information and from the testimony of the Ground Agent.

The standard configuration was 13 Cabin Crew and a standard weight for the pantry. On this flight there were 12 Cabin Crew.

The Ground Agent initialized the flight in the GAETAN system.

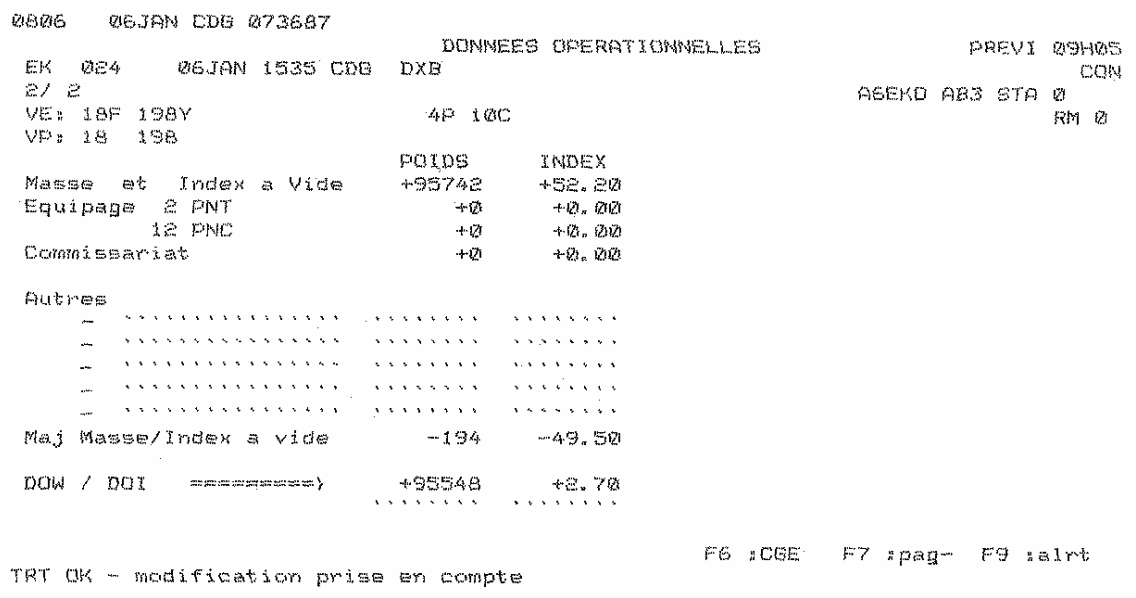
On the first screen, having entered the details identifying the flight, (No., Date, Registration,...), the Ground Agent then changed the Cabin Crew information from the standard to the actual number. This modification caused a message to appear at the bottom of the screen, “Correct the DOW/DOI of the Cabin Crew weights.”

Note : the following screens were reconstituted during the course of the investigation from the available data and from testimony. These are not the original screens.

```
0805   06JAN CDG 073687
                              DONNEES OPERATIONNELLES REELLES       PREVI 09H05
 EK  024    06JAN 1535 CDG  DXB                                          CON
 1/ 2                                                    A6EKO A83 STA 0
 VE: 18F 198Y                  4P 10C                                    RM
 VP: 18  198                                             IMM .......
 PAX        M/F   0/  0/  0/  0          ADT   0/  0/  0      PNT 2 ..  PNC 12 ..
 STE    800                    (-- Tare Incluse        PEQ BAG POS  .... ....
 DOW  95742  DOI     52.2
                    -Maxi-
 ZFW  96542         130000
 FUL  45000 ......   54210   ..
 TXW 141542         172600
 ROU    400 ....
 TOW 141142         171700                          CHD 31358   COR 30558
 DEL  35000 ......          EAU      ....
 LAW 106142         140000
 MAXZFW ......: MAXTXW ....... MAXTOW ....... MAXLAW ....... VER CODE ............
 STD WEIGHT PER PAX : ADT  75   MEN 75   FEM 65   CHD 38   INF 10    M/F +
 QFU ...   QNH ....   TEM . ..   WIND ... / ..   FLAP ..   ENG ..........
 ..........................................................
 ACLT C   RC ....   PLAN 0101  DELTA CARBU 1

                                                  F6 :CGE   F8 :pag+  F9 :alrt
CORRIGER DOW/DOI des masses PNC
```

The Ground Agent then went on to the second screen. The Crew number had been changed automatically by the system but the weight and index corrections due to the number of crew had not been changed. The Ground Agent therefore manually calculated the weight and the basic balance index in operating configuration and entered the results on the DOW/DOI line on the second screen. The figures used in this manual calculation were found noted on the folder containing the items in the flight folder.



For the manual calculation, the Ground Agent took the aircraft basic weight and index and applied the corrections corresponding to the crew (2/12) and the pantry. At this point an error occurred, the correct values for 2 Pilot and 12 Cabin Crew with baggage being 1,400 kgs and -1.7 (index correction) whereas the Ground Agent entered values of 1,400 kgs and -0.7.. The index of -0.7 corresponds to the variation in the index for 2 pilots and 12 cabin crew on an Emirates A310-300 aircraft, and the Ground Agent was working from memory without referring to the documentation.

The type of pantry had a weight of 3,532 Kg with an index variation of -1.9.

The Ground Agent entered the aircraft weight (95,548 Kg) and index at 07 h 37. Because of a typing error, the figure 2.7 was entered as the index instead of 52.7.

Therefore a DOI value of 2.7 was registered was and used in further calculations instead of the correct DOI which was 51.7.

Note : According to some witness statements, the number 5 button on the keyboard of the computer was not working correctly and even pressing it several times did not always work. It appears to have been replaced a couple of days after the incident. It was not possible to test the keyboard as it was not found.

Next, at the beginning of the afternoon at around 14 h 00, the Ground Agent made a load prediction based on the freight and passenger data supplied by the computer and the airline (Emirates).

We may note that the weight of the passengers' baggage was much higher than predicted ; 6,000 Kg at the completion of check-in, compared to a prediction of 3,120 Kg.

The total quantity of freight predicted was too heavy to permit take-off within the maximum permitted weight limits. The Ground Agent therefore indicated that an "AFM" type pallet weighing 3,470 Kg could not be loaded.

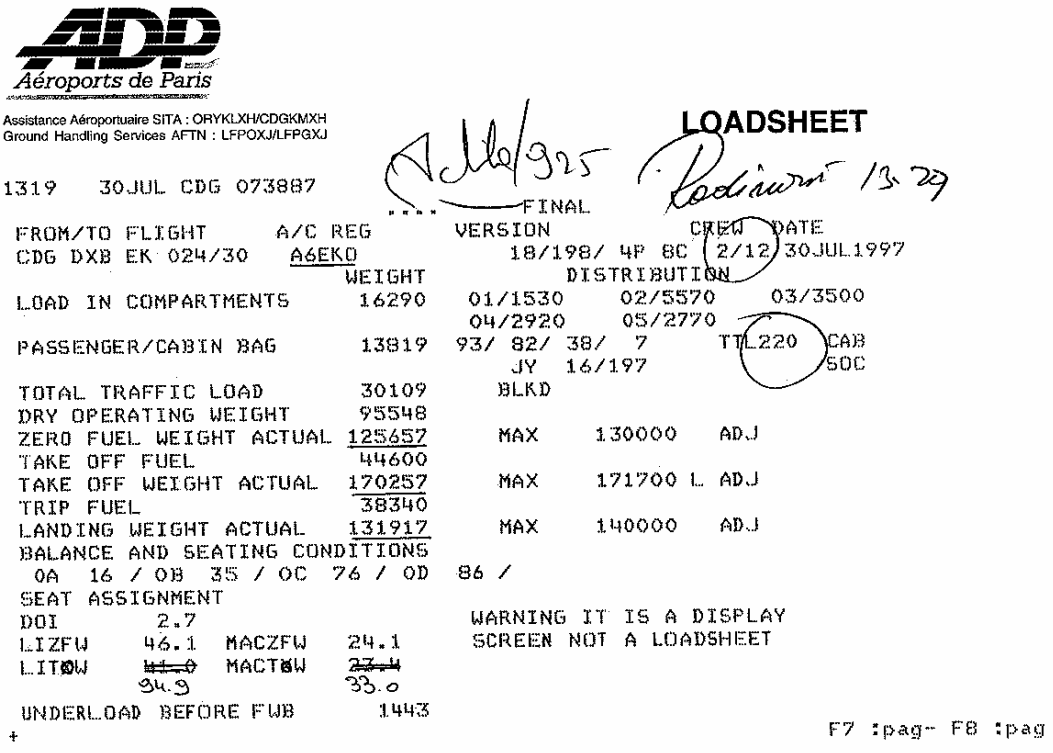
To ensure that the balance of the plane was within the permitted limits, she positioned the pallets and containers at the rear, (leaving space vacant at the front of the forward hold), and placed 2,770 Kg of baggage and bulk freight in the aft hold.

```
0839   06JAN CDG 073687
                                - LISTE CHARGES FRET LOCALES -          PREVI 09H39
EK  024    06JAN 1535 CDG  DXB                                                 CON
1/ 1                                                          A6EKO AB3 STA Ø
VE: 18F 198Y                    4P  9C                                        RM
HLC H-                                                  lig      ord          fd     915
NR DEB -----ULD-----  MASSE PCE S V I N G PSN ------CODES------- AP UD R -ADR- LMC
 1  DXB PMC7342EK      3970      A     C   22P
 2  DXB PMC90089NH     1600      A     C   21P
 3  DXB PMC90365NH     1530      A     C   12P
 4  DXB AMF5362EK      3410      A     C   XXX
A   DXB ALF8041EK      1430      A     C    31
B   DXB AKE1927EK       260      A     C   32L
C   DXB                146      A     C    05
D   DXB                463      A     M    05
E   DXB                305      A     C       COU                              939



EXP :                                                                 SI sup: NON
Si:
                     F3 :SIsup          F6 :LCI                       F9 :alrt
TRT OK - modification prise en compte
```

The result was still not within the permitted balance limits and the system displayed the message, “Warning, it is a display screen, not a loadsheet” in the middle of the screen displaying the weight and balance information :



Aéroports de Paris

Assistance Aéroportuaire SITA : ORYKLXH/CDGKMXH
Ground Handling Services AFTN : LFPOXJ/LFPGXJ

LOADSHEET

1319 30JUL CDG 073887 ....FINAL

FROM/TO FLIGHT	A/C REG	VERSION	CREW	DATE
CDG DXB EK 024/30	A6EKO	18/198/ 4P 8C	2/12	30JUL1997

	WEIGHT	DISTRIBUTION
LOAD IN COMPARTMENTS	16290	01/1530 02/5570 03/3500 04/2920 05/2770
PASSENGER/CABIN BAG	13819	93/ 82/ 38/ 7 TTL220 CAB JY 16/197 SOC
TOTAL TRAFFIC LOAD	30109	BLKD
DRY OPERATING WEIGHT	95548	
ZERO FUEL WEIGHT ACTUAL	125657	MAX 130000 ADJ
TAKE OFF FUEL	44600	
TAKE OFF WEIGHT ACTUAL	170257	MAX 171700 L ADJ
TRIP FUEL	38340	
LANDING WEIGHT ACTUAL	131917	MAX 140000 ADJ

BALANCE AND SEATING CONDITIONS
0A 16 / 0B 35 / 0C 76 / 0D 86 /
SEAT ASSIGNMENT
DOI 2.7
LIZFW 46.1 MACZFW 24.1
LITOW ~~41.0~~ 34.9 MACTOW ~~23.4~~ 33.0
UNDERLOAD BEFORE FWD 1443

WARNING IT IS A DISPLAY
SCREEN NOT A LOADSHEET

F7 :pag- F8 :pag
+

Screen printout corrected by hand and given to the crew

This result did not surprise the Ground Agent as many of the airline's flights require fuel to be transferred to the aft trim tank in order to achieve a takeoff CofG within the permitted limits.

The version of the GAETAN system used by ADP for Emirates flights did not allow balance calculations to be made by transferring fuel to the trim tank. This is why, in accordance with company procedures (Manual page 5.3/4 ; see 1.16.4), the Ground Agent printed the loadsheet as it was, and carried forward the weight and the CofG, without the fuel transfer, onto a manual trim sheet. Then the Ground Agent shifted the CofG. backwards to the middle of the authorized range, and from there deduced the amount of transfer fuel required (4,000 kg) to obtain that result (see appendix 1). We can see that on this sheet :
- the Ground Agent entered a DOI of 52.7,
- only the lower section of the trim sheet from the Zero Fuel Weight index to the weight and balance index at take off was filled out.

Both documents (which were given to the crew) are reproduced in appendix 2.

GAETAN can print a computerized trim sheet, but Emirates supplies a standardized trim sheet to be used by ADP. The Ground Agent noted the position of each container by hand before informing the Supervisor in charge of loading the aircraft.

In addition, she gave the crew, among other documents, the computerized loadsheet and the manual trim sheet, indicating the quantity of fuel to be transferred.

1.16.4 ADP Procedures

Some extracts from the ADP manual regarding the ground handling of Emirates aircraft, which relate to the incident, are reproduced below. The manual contains the tables for manual calculations as mentioned in see 1.16.1 and 1.16.2.

Page 5.3/4 shows the procedure to correct an aircraft center of gravity outside authorized limits by the transfer of fuel to the aft trim tank.

EC.N.KN - CDG - Cie : UAE - Type avion : * / * P : 5.3 / 4

PROCEDURES COMPAGNIE
PAR TYPES AVIONS

A300-600 et A310-300 Trim tank	Centrage hors limite au décollage. Le centrage hors limite peut être corrigé vers l'arrière en utilisant le transfert de fuel dans le trim tank. Cette correction est effectuée à la main et n'implique en aucun cas un changement de la quantité de fuel embarquée. Attention La procédure de transfert de fuel ne doit être utilisée que pour une correction de centrage au décollage et dans aucun autre cas. Déterminer la quantité à tranférer en utilisant la ligne de pas TRANSFERT TRIM TANK sur la feuille de centrage manuel. Joindre au Devis De Masse informatisé une copie de la feuille de centrage manuel indiquant la quantité de fuel transféré et la correction de centrage effectuée.
Trim tank inutilisable	Lorsque le Trim tank est inutilisable les opérations Emirates expédient un message sous le format A6EK. is operating with trim tank INOP

Specific information regarding DOW and DOI is on page 6.1/1.

EC.N.KN - CDG - Cie : UAE - Type avion : * / * P : 6.1 / 1

PROCEDURES GAETAN

Poids et Index	Sont inclus dans les DOW / DOI - Poids et Index de base - Poids et Index de l'équipage standard - Poids et Index de la pantry

When one of the parameters calculated on the trim sheet falls outside the permitted limits, the system will not produce a normal printout. It is only possible to make a screenprint using a specific procedure. This is described on page 5.3.4 of the manual on which a telex from the GAETAN management service is printed.

1.16.5 Study of Emirates Loading Plans for 1997

120 loading plans, compiled by ADP for Emirates A300-600 and A310-300 flights between January 1 and November 30 1997 (excluding this incident) were examined for aspects relevant to this investigation.

The following aspects were highlighted :

- Only 8% of the flights had the « standard » crew configuration (2 Pilots, 13 Cabin Crew).

- 27% of flights required a fuel transfer to the aft trim tank before the flight.

- The quantities transferred varied between 200 kg and 3,000 kg, with an average of 1,481 kg.

- The Ground Agent responsible for the incident flight had worked on 45% of Emirates flights between January and July 1997.

1.17 Crew Testimony

The crew received the following items in the flight folder :

- A computerized printout showing the calculation of the aircraft weight and balance, without fuel transfer, with the heading, “Loadsheet”, but with a warning, “Warning, it is a display screen not a loadsheet”.

- A manual trim sheet, on which only the portion between the, ‘zero fuel’ index and the take-off index was completed.

The crew stated that they did not understand the meaning of the warning, but that they did not give it any further thought. They checked that the load in the holds, and the resulting index changes, were correctly reflected on the manual trim sheet, without noticing that the DOI on the computerized loadsheet differed from that on the manual trim sheet.

They then entered the zero fuel weight and index in the Flight Management System, (FMS), and verified that the weight and balance indicated by the FMS corresponded to the load sheet.

For take-off, the crew advanced the throttles until the engine thrust stabilized at around 70% N1. They then applied full power, at which time the aircraft pitched upwards until the tail touched the ground.

The crew immediately closed the throttles to reduce thrust, and aborted the take-off. Immediately thinking it to be a loading problem, the Captain decided to return to the gate. He did not realize that the aircraft’s tail had touched the runway and so did not think that any damage had been done. He thought they would be able to depart again after modifying the load.

2 - ANALYSIS

2.1 Calculation of Estimated Weight and Center of Gravity

The version of GAETAN used by ADP on Emirates flights and the relevant complementary documentation do not allow the direct entry of precise variations in the weight and balance index resulting from a non-standard crew/pantry configuration. The DOA must either be calculated from the empty index and the weight and balance index values for the configuration on that day ; or by calculating the difference in weight and balance from values corresponding to the standard configuration value and the configuration on the day.

The fact that the data for the configuration on the day is not entered directly into the system but is the result of an intermediate calculation, means that no direct computer check of the recorded data is possible.

A confusion between two configurations would only lead to a minimal difference in the weight or balance index. However, a data input error could result in a much more significant difference.

The option chosen by the Ground Agent meant recalculating the empty operating weight and balance index from the weights and indexes corresponding to the configuration on the day.

It can be seen in paragraph 1.16.3 that, for a configuration with 12 Cabin Crew, the Ground Agent used the appropriate weight for the A300-600, but the index correction corresponding to an A310-300, because the Ground Agent relied on her memory without checking the figures on the documentation.

This error would only have a minor impact on the calculated index and, in isolation, would not have affected the flight.

The real index was 51.7, the calculated index was 52.7, but because of a typing mistake the value 2.7 was entered. This typing mistake was detected neither at the time it was entered nor during the rest of the flight preparation.

The Ground Agent did not check the preliminary data earlier in the morning. Later, when she entered loading data for the aircraft which produced a very aft-oriented center of gravity, she did not go back over the preliminary phase of her work and did not double-check the data entered in the computer system.

These two errors were routine. They occurred during the transition between a manual stage and a computerized stage and reveal an absence of double-checking procedures in these operations.

Furthermore, as will be seen in paragraph 2.2, these errors could have been avoided or detected by optional additions to the GAETAN system.

Note : The same phenomenon was noticed during observations of flight preparations by other agents on other flights : no checks were made on the accuracy of data and results (for example, data received by radio was not repeated to check that the figures had been heard and noted correctly).

After calculation of the estimated weight and CofG, neither the basic data nor the intermediate calculations were checked, so as to validate the intermediate results before using them for the next stage.

The whole process is carried out by one person with no backup checks. For example, the person in charge of the “physical” loading of the aircraft only receive a loading plan for the holds without the data necessary to check the plan. Therefore, although some loading supervisors were qualified Ground Agents, they were unable to check the plan.

Pressure of time during the last stage of flight preparation, with several last minute changes and the need to respect departure schedules, may force staff to work continuously without checking the results of their actions.

In the early stages of flight preparation, stress connected with departure timing and last minute changes is not a factor. The workload is not so heavy and it is possible to check the intermediate results and to review the whole calculation process, in case of any anomalies. However, it is possible that the conditions towards the end of flight preparation, associated with the repetitive nature of the operations for each flight, have led to a change in the checking process over the years, not only during the final stage, but during the whole preparation process.

During the operations carried out from 14 h 00 onwards, the Ground Agent encountered three problems :

- a potential overload causing her not to load a pallet of 3,470 kgs.
- a passenger baggage weight much higher than predicted.
- a calculated CofG well forward of the authorized limit.

The Ground Agent did not detect the real reason for the latter problem, (an error in the basic index), and was not surprised because the situation is relatively frequent on Emirates A300-600’s, whose take-off weight is often close to the maximum, and whose permitted CofG range is reduced and corresponds to the aft limit.

The Ground Agent therefore developed the loading plan by putting as much weight as possible at the rear of the aircraft.

The resultant CofG was still forward of the authorized range. Although this was not unusual, the Ground Agent did not notice that the difference was much greater than normal although the weight in the rear baggage hold was twice the maximum load on other flights.

This difference should have led the Ground Agent to check the whole process of calculation of the loading plan.

The Ground Agent transferred fuel to the tail tank to bring the CofG to the authorized position. The use of this procedure raises several issues :

- It was not unusual : it was used on 27% of Emirates flights in 1997. However, the quantity of fuel transferred was higher, (4 tons instead of between 400 Kg to 3,000 Kg, with an average of 1,500 kg),

- GAETAN does not allow calculations on fuel transfer to the tail tank. These calculations have to be done manually on a trim sheet.

To do so, the Ground Agent used the intermediate results provided by the computer system : the weight and balance index without fuel.

The Ground Agent transcribed the DOI value to the manual trim sheet from the flight folder, (where she had originally calculated it). Thus the correct value of 52.7 was written on the trim sheet, and not the figure of 2.7 which was entered for computer calculations.

The fact that the original paper data was used instead of the data entered in GAETAN had two consequences :

1) The Ground Agent did not realize her error and nor did she realize that the intermediate results obtained were invalid

2) The value entered on the trim sheet was correct, and no-one referring to it would realize there was a mistake elsewhere (see the paragraph below concerning the check carried out by the crew).

Furthermore, the Ground Agent had manually entered on the baggage hold plan specific to the airline the position of each container, determined during the calculation of the weight and CofG.

The GAETAN system allowed the printing of a computerized plan of the baggage hold but only in a standard format, different from the one used by the company.

In this case, there was no problem, but the non-use of this option and the manual transfer of data are potential sources of error.

2.2 Analysis of the Computer System

As we have seen, the problem occurred due to a typing error at the conclusion of an intermediate manual calculation, an error which was not detected later on.

This calculation was made from standard operating data, based on the registration of the aircraft, the number of crew and the type of pantry. The number of possibilities was limited and did not vary from day to day. The Ground Agent enters the variable data, (registration, crew, pantry). It would therefore have been possible for the system to be programmed with the data for each configuration The

system would then have been able to automatically calculate the DOI and DOW, which would have eliminated possibility of error.

What is more, whatever the operational configuration of the aircraft is, the DOI should always be between 48.5 and 54.4, and the DOW between 94,500 and 95,900 kgs.

It would therefore be possible to add a sub-program to check that the recorded data is realistic. An entry error would be detected immediately or would only have limited consequences for safety.

Moreover, the system requires several transitions between manual stages and computerized stages. This lack of continuity is a potential source of error at each transition.

The most common crew configuration is 2/12 for the Emirates A300-600 R and 2/11 for the A310-300. It would be more logical to use these configurations as the norm and thus avoid manual calculations in the majority of cases, eliminating the risk of error.

The last transfer to the manual mode is made when it is necessary to take off with fuel in the tail tank to obtain an acceptable CofG, since GAETAN does not perform this function.

Even if this function had been performed by the computer system, this would not have corrected the initial errors but they (especially the DOI of 2.7) would have appeared in print. This would perhaps have led the pilots to detect the error.

2.3 Handover of Flight Folder to the Crew

In the flight folder the crew received :

- The computerized print-out of weight and CofG, with manual corrections
- A manual trim sheet on which only the section between the index “zero fuel” and the index of "take-off " was completed.

The crew declared that they checked the documents and especially the load in the baggage holds, and the data on the manual trim sheet. Like the Ground Agent, the crew did not realize that the weight in the rear baggage hold and the quantity of fuel in the tail tank were much higher than usual.

Neither did they detect the incorrect DOI on the computerized load sheet.
Two factors may explain this :

- The correct value was clearly visible in the center of the manual trim sheet, while the incorrect figure on the computerized load sheet was lost among other values.

- The DOI is not directly relevant to ground handling, nor is it part of the data used by the pilot for the checks made with the FMS (see below).

Here again, the multiplicity and heterogeneity of the different kinds of documents played a role in the fact that the load anomaly was not detected, especially as the transfer of fuel is not an unusual procedure, even if a large quantity was transferred.

The use of the FMS to check the weight and the CofG of the aircraft did not lead to detection of the error. Indeed, in accordance with procedures, the crew entered the ZFW in the FMS, that is to say an intermediate result arrived at after the error had occurred.

2.4 Take off

The crew opened the throttles progressively. As can be seen in paragraph 1.11.2 when the engines reached full power the aircraft pitched up and touched the ground with its tail. The pilot then aborted the takeoff.

The crew immediately thought that it was a loading problem and decided to go back to the gate to resolve the problem. The crew members were unaware that the aircraft had touched the ground. Even so, information that the tail had touched was given on their frequency by an Air France crew, but as the crew of A6-EKO did not understand French, it would have been necessary for the controller to translate, which was not done.

The crew thought that they would be able to leave again very soon, until a ground mechanic detected the damage on the lower part of the rear fuselage.

3 - CONCLUSIONS

3.1 Findings

- At Paris-Charles De Gaulle airport, Emirates subcontracted its ground handling operations to Aéroports de Paris. The GAETAN computerized system was used for calculations of the estimated weight and center of gravity.

- The Ground Agent responsible for calculating the weight and CofG estimate for A6-EKO on July 30 1997 had the required qualifications to provide ground assistance to Emirates.

- The Ground Agent started the process of calculating the weight and CofG and the loading plan of the aircraft at around 07 h 30.

- The Ground Agent entered the basic data concerning the flight, (date, flight No, crew and pantry configuration …).

- The crew configuration on the day consisted of 12 Cabin Crew instead of a standard configuration of 13.

- The GAETAN system stores the dry operating weight (DOW) and the dry operating index (DOI) for the standard configuration in its memory, but does not calculate the DOW and the DOI for other configurations.

- The Ground Agent had to recalculate the DOW and the DOI manually to take into account the difference from the standard configuration.

- When entering the results of this calculation in the computer system, the Ground Agent entered 2.7 instead of 52.7 for the DOI.

- The typing mistake was not detected and the computer program does not include a double-check function.

- Because of this error, in order to obtain a take off CofG within the authorized range the loading of the baggage holds was carried out by placing maximum weight in the rear, and four tons of fuel were transferred to the tail tank.

- For take off, the weight of the aircraft was below the authorized maximum takeoff weight. The CofG was aft of the authorized limit.

- GAETAN cannot perform the calculation of the CofG automatically in case of the transfer of fuel to the tail tank.

- This operation was therefore done manually.

- The crew received :
  - A print out of the loadsheet, before transfer of fuel to the rear, on which the incorrect DOI appeared.
  - A manual trimsheet, showing the intermediate result carried from the previous sheet, a graphic representation of the transfer of four tons of fuel to the rear tank, as well as the final CofG. The correct DOI was marked on this sheet.

- The crew did not detect the error, which appeared only on the first sheet.

- During acceleration for take-off, at a speed of 40 knots the aircraft pitched up and its tail touched the ground.

- The pilot aborted the take off and returned to the gate.

3.2 Causes

The incident occurred due to the incorrect distribution of weight in the aircraft, causing a CofG a long way aft of the authorized limit.
This distribution was the consequence of an error in entering the dry operating index at the beginning of the process of calculating the loadsheet, an error which was not subsequently detected.

4 - RECOMMENDATIONS

1. Analysis of the incident shows insufficient checks on operations performed at different stages in flight preparation.

Consequently, the BEA recommends :

- that during the initial training and at regular intervals, aircraft loading specialists be made aware of the importance of double-checking work performed at each stage.

2. Study of the version of the GAETAN system used by ADP for processing weight and balance operations for Emirates A300-600's and A310's, shows that it is not very user-friendly and can easily cause errors. The basic data of the application is incomplete or poorly adapted ; the program generates several transitions between manual and computerized modes ; the internal checks are inadequate and allow errors to be included in the calculation of basic data, without drawing the operator's attention to the apparent invalidity of the figures entered .

Consequently, the BEA recommends :

- that the GAETAN system be updated with already existing or newly-developed options which allow computer operations to be carried out in sequence without any need to revert to manual calculations.

- that computerized checks and tables of values be integrated into the system, to allow values considered abnormal to be detected when entered.

Note : ADP, when consulted about the draft report indicated that the following checks have been put in place as a subsequent to the incident :

- Introduction *of an automatic loading plan with the Flight Crew/Cabin Crew numbers as well as the PANTRY code thus avoiding manual calculations related to this data.*

- *During flight preparation, if two qualified ADP agents, recognized by the airline, are simultaneously present, they carry out a cross-check of the DOW/DOI. Otherwise the cross-check is carried out the ADP agent responsible for the flight and a company representative.*

- *In the case of a fuel transfer procedure, the crew is provided with a statement of the weight with the warning screen and a screenprint of the weight estimate bearing the warning : "Warning, this is a display screen not a loading condition statement" on plain paper and not on ADP headed paper, as well as a manual balance completed from the DOI to the final CofG data.*

As regards the use of the GAETAN system, the following two measures are to be implemented :

- *The introduction of a minimum and maximum DOI limit. This request was made in March 1998 by the Air France which manages the application, though as yet no provisional introduction date has been given.*

- *A procedure for fuel transfer automation is in development. Test flights have been carried out and transmitted to Emirates for the certification of this procedure. They have yet to give a response.*

As regards ADP agents responsible for this activity, in addition to systematic periodic training by a company instructor to be carried out every two years, a plan for continuous assessment of knowledge is being set up by the ADP training service in order to test levels of competence.

3. One pilot who witnessed the incident immediately informed the controller by radio specifying in French that the aircraft's tail had touched the ground.

This information was not relayed in English to the crew.

Consequently, the BEA recommends :

- that controllers be made aware of the importance of passing on to crews, in their working language, any safety information transmitted to the controller in other languages.

Appendices

APPENDIX 1
Loading file

APPENDIX 2
CVR transcription

ADP
Aéroports de Paris

Assistance Aéroportuaire SITA : ORYKLXH/CDGKMXH
Ground Handling Services AFTN : LFPOXJ/LFPGXJ

LOADSHEET

1319 30JUL CDG 073887

.... FINAL

FROM/TO	FLIGHT	A/C REG	VERSION	CREW	DATE
CDG DXB	EK 024/30	A6EKO	18/198/ 4P 8C	2/12	30JUL1997

	WEIGHT	DISTRIBUTION		
LOAD IN COMPARTMENTS	16290	01/1530	02/5570	03/3500
		04/2920	05/2770	
PASSENGER/CABIN BAG	13819	93/ 82/ 38/ 7	TTL 220	CAB
		JY 16/197		SOC
TOTAL TRAFFIC LOAD	30109	BLKD		
DRY OPERATING WEIGHT	95548			
ZERO FUEL WEIGHT ACTUAL	125657	MAX 130000	ADJ	
TAKE OFF FUEL	44600			
TAKE OFF WEIGHT ACTUAL	170257	MAX 171700 L	ADJ	
TRIP FUEL	38340			
LANDING WEIGHT ACTUAL	131917	MAX 140000	ADJ	

BALANCE AND SEATING CONDITIONS
0A 16 / 0B 35 / 0C 76 / 0D 86 /
SEAT ASSIGNMENT

DOI	2.7		
LIZFW	46.1	MACZFW	24.1
LITOW	~~41.0~~ 94.9.	MACTOW	~~23.4~~ 33.0

UNDERLOAD BEFORE FWB 1443

WARNING IT IS A DISPLAY
SCREEN NOT A LOADSHEET

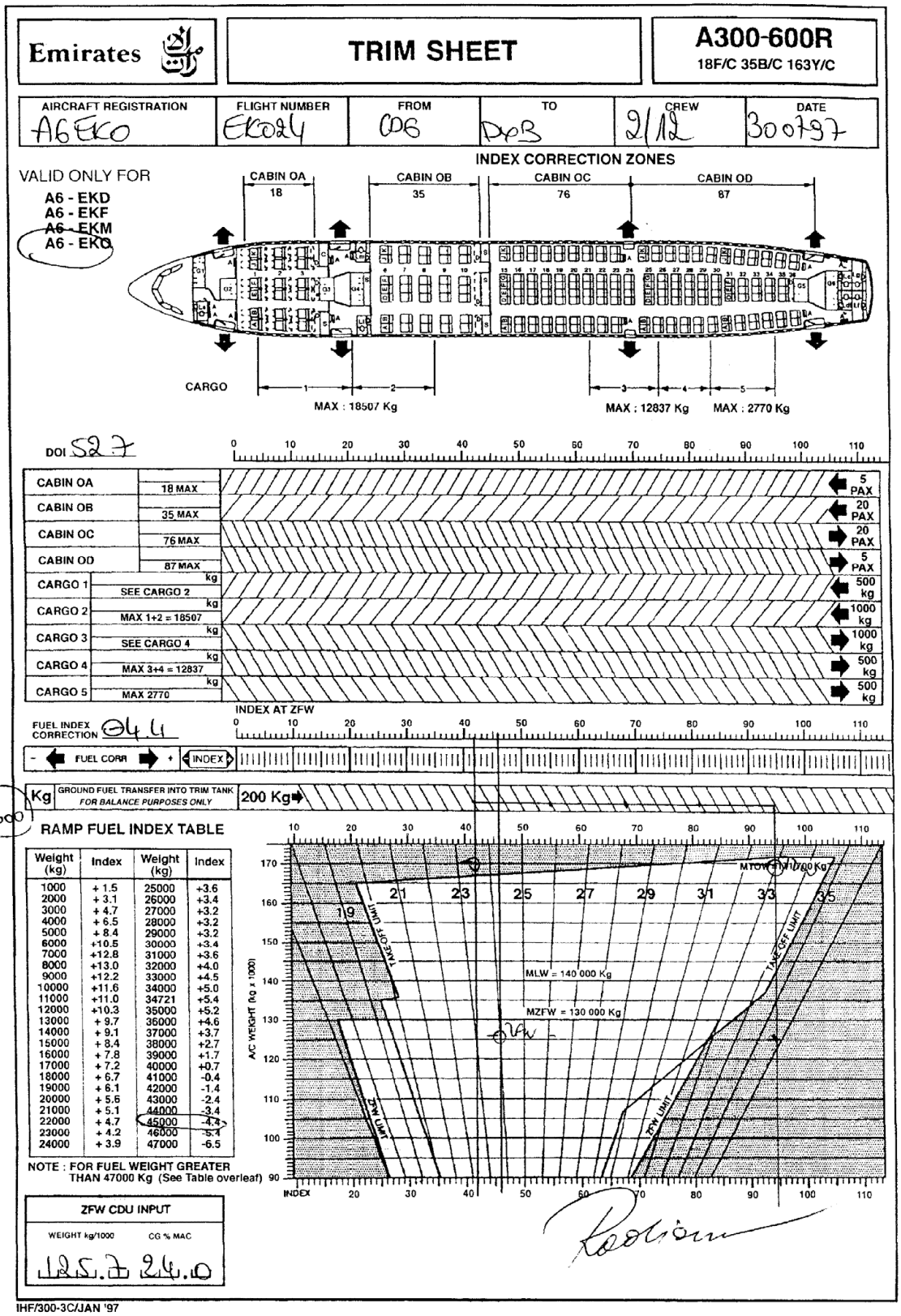
+ F7 :pag- F8 :pa

1320 30JUL CDG 073887
5H19 MESSAGE CHARGEMENT PAX/CARGO REEL
EKN 024 30JUL 1535 CDG DXB WO
1/ 1 A6EKO AB3 STA

EK024/30.A6EKO.18/198.2/12
-DXB.93/82/38/7.T16290.01/1530.02/5570.03/3500.04/2920.05/2770
.PAX/16/197
SI-DXB.B6106.C9241.ENIL.M463.NBR.BAG313
SI-VERS PHYS/18/198
AZFW 125657KGS
OCS BAG NBR 0000 LDD 42R

N° 845153-07/95

«I hereby certify that loading of this aircraft is in accordance with currently approved loading instructions»


Emirates
TRIM SHEET
A300-600R
18F/C 35B/C 163Y/C
AIRCRAFT REGISTRATION
A6EKO
FLIGHT NUMBER
EK024
FROM
CDG
TO
DXB
CREW
2/12
DATE
300797
INDEX CORRECTION ZONES
VALID ONLY FOR
A6 - EKD
A6 - EKF
A6 - EKM
A6 - EKO
CABIN OA
18
CABIN OB
35
CABIN OC
76
CABIN OD
87
CARGO
MAX : 18507 Kg
MAX ; 12837 Kg
MAX : 2770 Kg
DOI 52.7
CABIN OA 18 MAX
CABIN OB 35 MAX
CABIN OC 76 MAX
CABIN OD 87 MAX
CARGO 1 kg SEE CARGO 2
CARGO 2 kg MAX 1+2 = 18507
CARGO 3 kg SEE CARGO 4
CARGO 4 kg MAX 3+4 = 12837
CARGO 5 kg MAX 2770
5 PAX
20 PAX
20 PAX
5 PAX
500 kg
1000 kg
1000 kg
500 kg
500 kg
INDEX AT ZFW
FUEL INDEX CORRECTION 04.4
FUEL CORR
INDEX
Kg
GROUND FUEL TRANSFER INTO TRIM TANK
FOR BALANCE PURPOSES ONLY
200 Kg
4000
RAMP FUEL INDEX TABLE
Weight (kg) | Index | Weight (kg) | Index
1000 + 1.5 25000 +3.6
2000 + 3.1 26000 +3.4
3000 + 4.7 27000 +3.2
4000 + 6.5 28000 +3.2
5000 + 8.4 29000 +3.2
6000 +10.5 30000 +3.4
7000 +12.8 31000 +3.6
8000 +13.0 32000 +4.0
9000 +12.2 33000 +4.5
10000 +11.6 34000 +5.0
11000 +11.0 34721 +5.4
12000 +10.3 35000 +5.2
13000 + 9.7 36000 +4.6
14000 + 9.1 37000 +3.7
15000 + 8.4 38000 +2.7
16000 + 7.8 39000 +1.7
17000 + 7.2 40000 +0.7
18000 + 6.7 41000 -0.4
19000 + 6.1 42000 -1.4
20000 + 5.6 43000 -2.4
21000 + 5.1 44000 -3.4
22000 + 4.7 45000 -4.4
23000 + 4.2 46000 -5.4
24000 + 3.9 47000 -6.5
NOTE : FOR FUEL WEIGHT GREATER THAN 47000 Kg (See Table overleaf)
A/C WEIGHT (kg x 1000)
INDEX
MTOW = 171700 Kg
MLW = 140 000 Kg
MZFW = 130 000 Kg
TAKE OFF LIMIT
ZFW LIMIT
ZFW CDU INPUT
WEIGHT kg/1000
CG % MAC
125.2 24.0
IHF/300-3C/JAN '97

LOADING INSTRUCTION/REPORT

CPM	FLT. NO.	A/C REG.	FROM	TO	DATE	PREPARED BY
	EK 013/014	A6 EKO	DXB	BOM	30JUL97	AHUJA/U

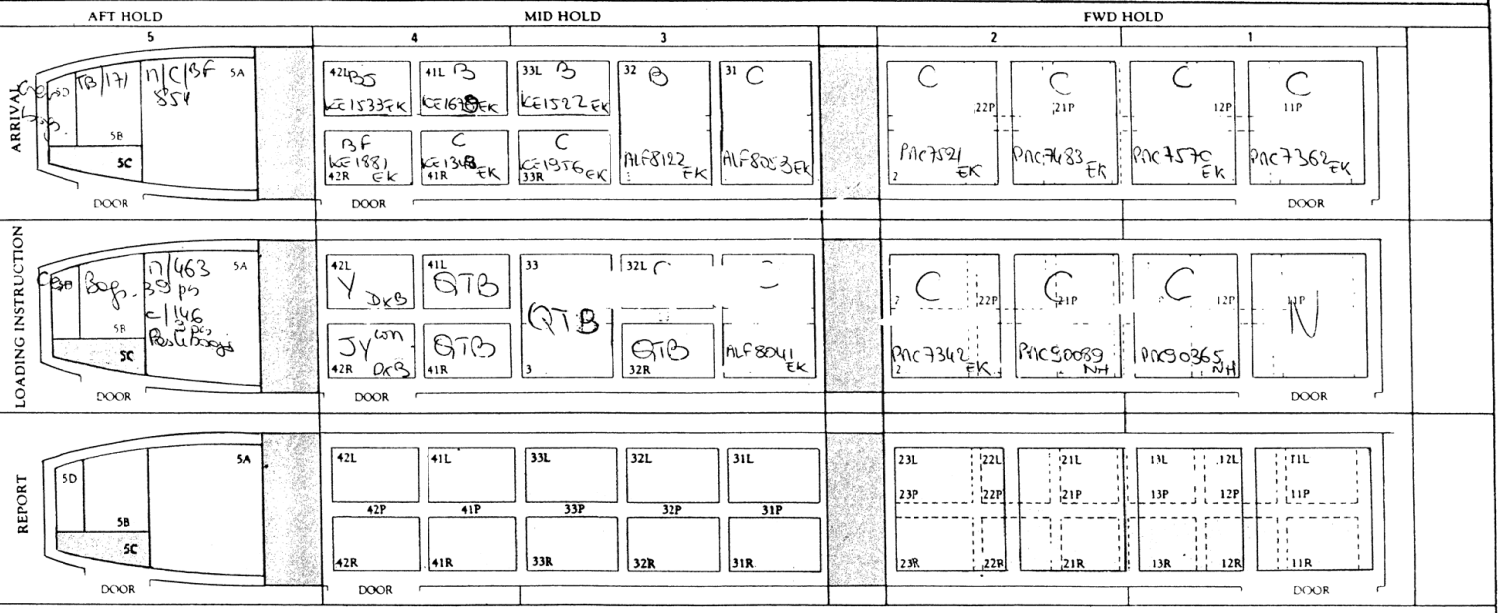
الإمارات Emirates A300-600R

Special Handling Instructions:
HFD = 153 SG

Sig. Trim Officer LIC. No.

This aircraft has been offloaded/loaded in accordance with instructions, including the deviations shown on the REPORT. All containers/pallets and bulk load have been secured in accordance with Emirates' regulations specified in Weight and Balance Manual

Signature / Staff No.
Loading Supvr. / Ramp Agent Staff



AFT HOLD (5) 2770 KGS.
DOOR DIMNS. 95 CMS × 107 CMS/37.4 IN × 42 IN
MAX CAPACITY 5A (51) 1841 KGS VOL. 11.5 CU.M./406 CU. FT.
MAX CAPACITY 5B (52) 657 KGS VOL. 4.7 CU.M./166 CU. FT.
MAX CAPACITY 5D (53) 272 KGS VOL. 1.5 CU.M /60 CU. FT.
NO LOAD IN ZONE 5C DUE DOOR OPENING

MID HOLD (3 & 4) 12837 KGS.
DOOR DIMNS. 181 CMS × 170 CMS/71.3 IN × 66.8 IN
MAX GROSS WT. PER **AKE** 1587 KGS. MAX VOL. 4.20 CU.M/153 CU.FT (61.5" × 60.4" × 64")
MAX WT. PER **ALF** 3174 KGS. MAX VOL. 8.7 CU.M/308 CU.FT. (125" × 60.4" × 64")

FWD HOLD (1 & 2) 18507 KGS.
DOOR DIMNS. 270 CMS × 170 CMS/106 IN × 66.8 IN
MAX GROSS WT. PER **PAJ/PMC** 4626 KGS.
MAX VOL. PER **PAJ** (125" × 88" × 64") 10 CU. M./353 CU. FT. MAX VOL. PER **PMC** (125" × 96" × 64") 10.9 CU. M./385CU. FT.
MAX GROSS WT. PER **AAP/AMF** 4626 KGS.
MAX VOL. PER **AAP** (125" × 88" × 64") 10.4 CU. M./ 367 CU. FT MAX VOL. PER **AMF** (125" × 96" × 64") 14.5 CU. M./511 CU. FT.

INFORMATION CODES

B - BAGGAGE	E - EQUIPMENT	D - CREW BAGGAGE	O - FULL X - EMPTY
C - CARGO	L - LEFT	F - F/C BAGGAGE	1 - 1/4 VOLUME AVAILABLE
M - MAIL	R - RIGHT	N - NO ULD AT POSITION	2 - 1/2 VOLUME AVAILABLE
S - RUMMAGE	P - PALLET	U - U/S CONTAINER	3 - 3/4 VOLUME AVAILABLE

T- (Q.T.B) TRANSFER BAGG

CVR TRANSCRIPT

** FOREWORD **

The following is a transcript of elements which were comprehensible, at the time of the preparation of the present report, on the cockpit voice recorder. This transcript contains conversations between crew members, radiotelephonic messages between the crew and Air Traffic Control services and various noises corresponding, for example, to the use of controls or to the alarms., between 13 h 56 min 51 UTC et 14 h 02 min 26 UTC

The reader's attention is drawn to the fact that the recording and transcription of the CVR are only a partial reflection of events and of the atmosphere in the cockpit. Consequently, the utmost care is required in the interpretation of this document.

** GLOSSARY **

CAM	Cockpit Area Microphone
HM-1	Pilot 1 CVR Channel 2 (copilot)
HM-2	Pilot 2 CVR Channel 3 (captain)
VHF	Communication with ATC
Ctl-1,2,3,4	Air Traffic Control centre for the frequency in use with controllers 1, 2, 3, 4
(*)	Words or groups of words not understood
(@)	Various noises, alarms
( )	Words or groups of words in brackets are still doubtful.

Incident to A-300A6-EKO at Roissy on 30/07/1997 **Transcript made on April 28 19 98**

Temps UTC	Hot Mike 2	Hot Mike 1	VHF	Observations
13h56min51			Ctl-1 : Emirates zero two four clear take off two seven wind two six zero degrees eleven knots	
13h56min56			HM-2 : Clear take off two seven Emirates two four	
13h56min57		(*)		
13h56min58	yes			
13h56min59		Brakes are off (*) are off okay		
13h57min09		(*) Take off		
13h57min10	Thrust SRS runway			
13h57min11		(*)		
13h57min12	Okay			
13h57min18	Thrust set			
13h57min21	What is it			
13h57min23				Whooler
13h57min25	What is it			
13h57min27				Loud noise of contact
13h57min28		Jesus what was that		
13h57min29	I don't know (*)			
13h57min32	I think okay			
13h57min34		You got control		
13h57min35	OK my control			
13h57min40	(*)			
13h57min42			Ctl-2 : Emirates zero two four do you have a problem ?	
13h57min44			HM-2 : Yes we are going to leave the runway and come back to the stand	
13h57min47			Ctl2 : Emirates zero two four vacate the runway	
13h57min49			HM-2 : Vacate the runway Emirates zero two four vacated	

Temps UTC	Hot Mike 2	Hot Mike 1	VHF	Observations
13h57min51			Ctl-2 : Emirates zero two four do you need the security	
13h57min54			HM-2 : Negative we just had a little bit of a problem with the climb... with the climb thrust okay so we'll go back to the stand	
13h57min58		Climb		
13h58min03			Ctl-2 : OK	
13h58min05		You have control		
13h58min06	OK			
13h58min07	OK (*) I control			
13h58min08		You control		
13h58min11		Jesus		
13h58min12	(I'm going around)			
13h58min13	OK	(*)		
13h58min14	After landing check list please			
13h58min16	Start the APU			
13h58min17		Yeah		
13h58min21	OK			
13h58min23	(*)	(*)		Discussion with a third person
13h58min24	Ah Ok we have a little bit of a problem here we just went (*)			
13h58min26	(*)	(*)	(*)	
13h58min33		(*) I think there is a problem there	AF : Tower from Air France (*) twenty-two fifty-six ***	***(In French in the original)
13h58min35		OK (*) after landing (*)	Ctl-2 : (*)twenty-two fifty-six ***	***(In French in the original)
13h58min37			AF : Yes, apparently the A-300 touched his tail on the runway ***	***(In French in the original)
13h58min39	He did anybody in the tail felt some thing else OK			
13h58min45	Ok	Ok		
13h58min46			HM-2 : Okay Emirates two four we've just vacated the runway two seven we'd like to go back to Whiskey five	

Temps UTC	Hot Mike 2	Hot Mike 1	VHF	Observations
13h58min52			Ctl-1 : Roger	
13h58min53			Ctl-2 : Emirates two four roger contact the ground one two one six	
13h58min56			HM-2 : One two one six good	
13h58min57	(*)	What was that		
13h58min59	I'll talk to them in a minute OK			
13h59min03		Jesus Christ holy		
13h59min05			HM-2 : Ground Emirates Zero Two Four (*) active 'd like to go back to Whiskey Five	
13h59min10			Ctl-3 : OK proceed via the Delta loop to Whiskey Five	
13h59min14			Cdb : Delta loop to Whiskey five	
13h59min15		That's a mess of crumple (*) the trim lays anyway		
13h59min18	(*) Maybe because of seventy per cent			
13h59min22	Maybe that's why it went up I don't know	Yeah		
13h59min24		No		
13h59min25		How could it possibly be ?		
13h59min26	I don't know			
13h59min27		Jesus it's unbelievable		
13h59min30		Wehh there is nothing that we did that I can see is a problem, but...		
13h59min32	I don't think we did any wrong	Is ...Ok		
13h59min33		(*) landing gear's down		
13h59min34	OK we go back to the			
13h59min36		Whiskey Five (*) Delta loop		
13h59min38	We go...			
13h59min42	First left don't	(*)		
13h59min45	Yes we go here			

Temps UTC	Hot Mike 2	Hot Mike 1	VHF	Observations
13h59min47		APU (*) Transponder radar		
13h59min51	Let's talk to the company please that we are going back I seems a trim problem			
13h59min57		You want me to talk to the comp		
14h00min00			HM-1 : De Gaulle operation Emirates Zero Two Four	
14h00min06			Ops : Emirates Two Four go ahead	
14h00min08			HM-1 : Yeah we had a problem just as we started our take off roll we are returning to Whiskey Five and we are not exactly sure what it would be if you'd like to come out to the and we'll have a talk	
14h00min20			Ops : OK sir we call the maintenance right now but please stand by errh we are trying to know if you can come back to Whiskey Five	
14h00min29			HM-1 : OK we'll stand by at the loop and we'll await instructions from you	
14h00min33	Talk to the passengers in two minutes Ok			
14h00min35			HM-2 : OK Paris Emirates Zero Two Four can we maintain this position or is it Whiskey Five confirm for us	
14h00min41			Ctl-4 : Euh you maintain this position I call you back for confirmation	
14h00min46			Cdb : Roger	
14h00min47	OK			
14h00min50		OK		
14h00min53	After landing check list please			

Temps UTC	Hot Mike 2	Hot Mike 1	VHF	Observations
14h00min54		Transponder is off trim seven degrees nose up I think it's what's that ... how do you mean		
14h01min05				
14h01min05				HM-2 begins talking to passengers
14h01min11		I think it's (*) anyway		
14h01min16			Ctl-4 : Emirates Two Four	
14h01min17			HM-1 : Go ahead Emirates Two Four	
14h01min19			Ctl-4 : Yes no problem for Whiskey Five Whiskey Five	
14h01min23			HM-1 : Whiskey Five thank you	
14h01min27			Ctl-4 : Emirates Zero Two Four I confirm via Delta loop to Whiskey Five	
14h01min28				HM-2 stops talking to the passengers
14h01min30			HM-1 : Thank you Delta loop to Whiskey Five Emirates Two Four	
14h01min33	OK sorry OK checks on system competed and whiskey five unloaded			
14h01min35		(*)		
	No we'll have to go that way anyway it's probably better			
14h01min45			HM-2 : Can we go first right Emirates Two Four ?	
14h01min49			Ctl-4 : Emirates Zero Two Four left around the Delta loop to stand Whiskey Five	
14h01min54			HM-2 : Roger thank you	
14h01min57		I have no idea what that was I would say possibly a trim problem		
14h02min01	I trimmed all the way forward			

Temps UTC	Hot Mike 2	Hot Mike 1	VHF	Observations
14h02min04	Because it went up and...	Yeah		
14h02min05	I hope	Who closed the throttles first you or me		(*)
14h02min14	We didn't touch with the tail but couldn't see how far we went up			
14h02min20		Who closed the throttles first you or me		
14h02min22	Errh say again			
14h02min23		(*)believe it it's unbelievable		
14h02min26	I don't know I don't know who closed the throttles			

END OF TRANSCRIPT