

The background of the slide is a photograph of an Air Europa aircraft's tail fin. The fin is white with the airline's name 'Air Europa' written in large, red, stylized letters. A blue globe logo is visible between the two 'Air Europa' text elements. The aircraft is flying against a clear blue sky.

# *CONVERTING AN AIRLINE TO CPDLC*

*(AIR EUROPA EXPERIENCE)*

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Cpt. Apple Tree



Cpt. Cherry Tree

*;; AEA is a very "Fruitful" Airline !!*



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# *Air Europa*

- *Founded in 1986*
- *Headquarters in Mallorca (Spain)*
- *80% Scheduled, 20% Charter Flights*
- *Domestic, European, American & Asian routes*

# *Air Europa*

## *Present Fleet:*

- *28 Boeing B737 - 800*
- *2 Boeing B737 - 400*
- *5 Boeing B767 - 200*
- *1 Airbus A340 - 200*

# *Air Europa*

## *Year 2010 expected Fleet:*

- *40 Boeing B737 - 800*
- *5 Airbus A330 - 200*
- *1 Airbus A340 - 200*

*A330 & A340 will be replaced with A350*

# *CPDLC Approach*

- *Alex Wandels visit to PMI (July 2003)*
- *Evaluation Team:*
  - » *Maint Engineering*
  - » *Computer Expert*
  - » *Handling*
  - » *Gnd Ops*
  - » *Flight Ops*

# *CPDLC Approach*

*Evaluation Team conclusion: CPDLC project useful for AEA due to:*

- *Future implementation*
- *ACARS introduction to AEA*
  - » *Handling*
  - » *Gnd Ops data link*
  - » *Maintenance data*
  - » *Flight Ops*
- *Eurocontrol incentives*



# CPDLC Approach

- *Project proposal to and approval by AEA Staff*
- *Contract signature with Eurocontrol (Jan 04)*
  - *19 B737-800 CPDLC / VDL-2 equipped by end 06*
  - *First fully operational flight before April 05*

# *CPDLC Development*

- *Meetings with Servers suppliers*
- *AEA server installation*
- *Equipment definition (CMU, printer...)*
- *OFG & LIT teams participation*

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# CPDLC Development

- *Flight Tests with new equipped aircrafts*
- *Crew Training*
- *DGAC authorisation*
- *Retrofit considerations (6 aircraft)*

# *Flight Tests Performed*

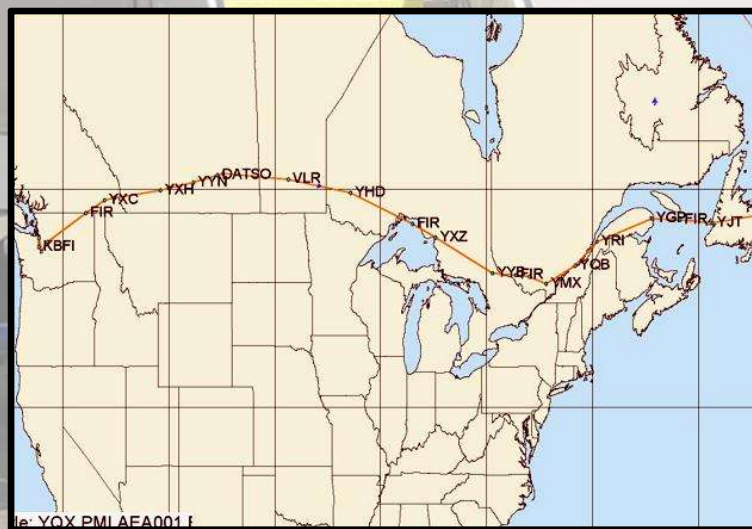
- *5 October 04: Boeing 1st delivery (EC-JAP)*
- *4 November 04: Boeing 2nd delivery (EC-JBJ)*
- *18 November 04: Boeing 3rd delivery (EC-JBK)*
- *24 November 04: Boeing 4th delivery (EC-JBL)*
- *26 January 05: MAD-ORY-MAD*
- *28 January 05: PMI-ORY-PMI*
- *18 February 05: MAD-ORY-MAD*

## *5 October: Boeing 1st delivery (EC-JAP)*

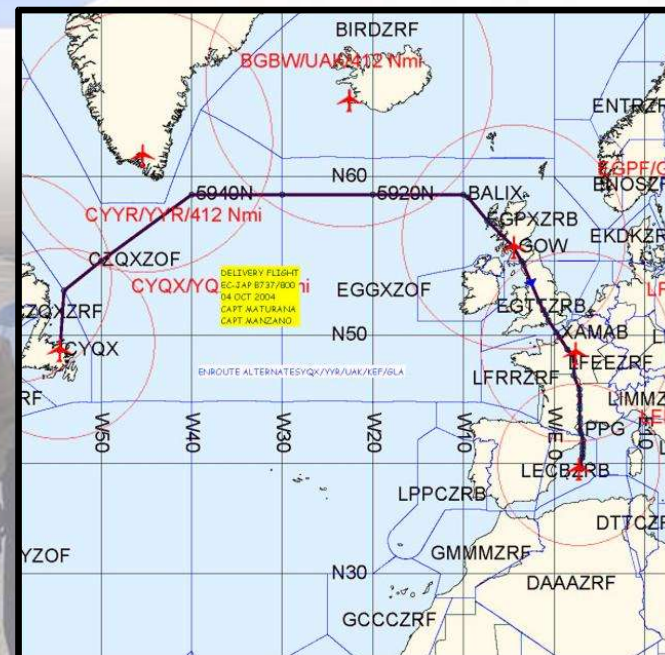
- *First Boeing Production Aircraft with VDL-2*
- *Training Session done before departure*
- *No previous experience with ACARS and Datalink*



# 5 October: Boeing 1st delivery (EC-JAP)



*Seattle - Gander*

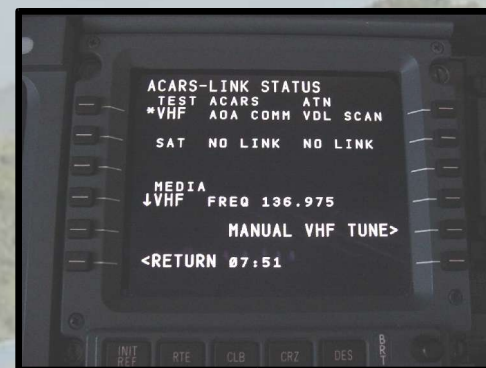
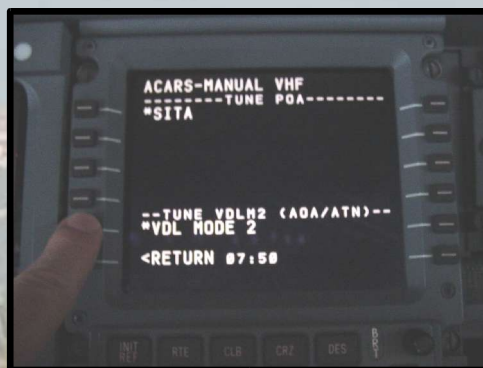
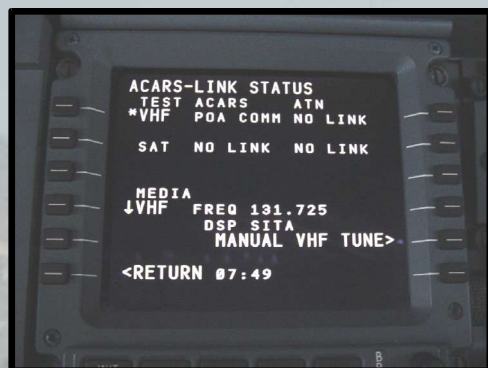


*Gander - Palma*

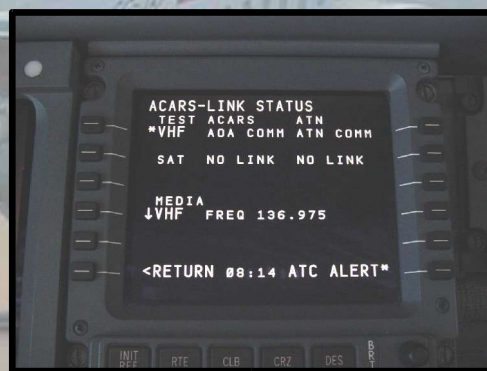
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## 5 October: Boeing 1st delivery (EC-JAP)



*Data Link had to be changed manually over U.K. from POA to AOA (ACARS to VDL-2)*



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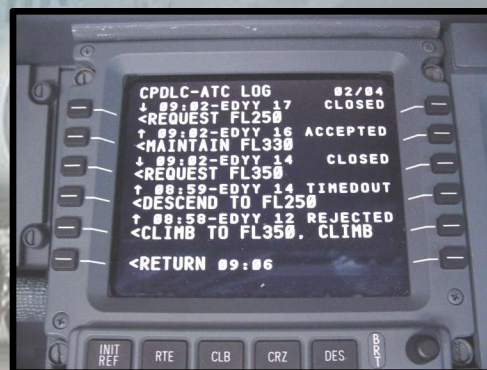
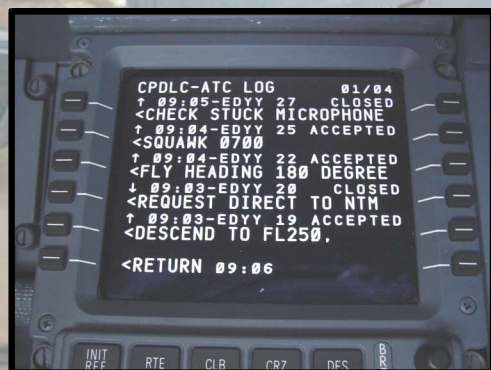
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## 5 October: Boeing 1st delivery (EC-JAP)



*Many messages were interchanged*



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# *5 October: Boeing 1st delivery (EC-JAP)*

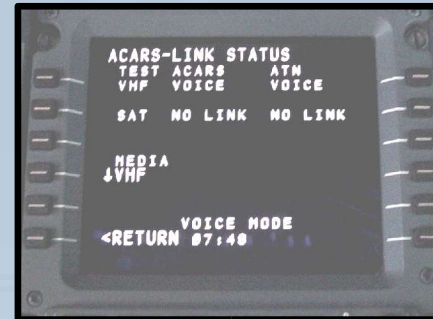
## *CONCLUSIONS:*

*Although link was interrupted  
for a few minutes .....*

*.....Test was very successful*



# *4 November: Boeing 2nd delivery (EC-JBJ)*



*No link could be established*



*Solution was easy but unknown for us*

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## *18 November: Boeing 3rd delivery (EC-JBK)*

Cond No	AIR/ GROUND	Procedure	Element#
1.	Air	<input type="checkbox"/> Downlink REQUEST FL250 message	dm6
2.	Ground	Upon receipt of downlink REQUEST FL250 message <input type="checkbox"/> Uplink DESCEND TO FL250, DESCEND AT 2000' MAXIMUM message	um23 + um174
3.	Air	Upon receipt of DESCEND TO FL250, DESCEND AT 2000' MAXIMUM message <input type="checkbox"/> Downlink WILCO	dm0

- *Predetermined Scenario was used*
- *Test was very satisfactory*

## *24 November: Boeing 4rd delivery (EC-JBL)*

```
CPDLC-MESSAGE      01/01
↑ 09:14-EDUU 0      OPEN
DESCEND TO FL350.
MAINTAIN 320 IAS.
PROCEED DIRECT TO BAMES

-----RESPONSE-----
*WILCO              UNABLE>
*PRINT              STANDBY*
<RETURN 09:14      ATC MSG*
```

```
CPDLC-ATC LOG       01/02
↑ 08:38-LFPY 15 TIMEDOUT
<DESCEND TO FL250
↑ 08:37-LFPY 13 REJECTED
<CLIMB TO FL350, CLIMB
↑ 08:36-LFPY 11 ACCEPTED
<TURN RIGHT 10 DEGREES
↑ 08:36-LFPY 9 ACCEPTED
<PROCEED DIRECT TO SPI
↓ 08:35-LFPY 6 CLOSED
<REQUEST DIRECT TO SPI
<RETURN 08:40
```

- *Previous experience was very useful*
- *Many messages were interchanged*



## *24 November: Boeing 4rd delivery (EC-JBL)*



*Final results were very successfull*

## *26 January: MAD-ORY-MAD*

Cond No	AIR/ GROUND	Procedure	Element#
1.	Air	Downlink REQUEST DIRECT TO NTM message	dm22
2.	Ground	Upon receipt of downlink REQUEST DIRECT TO NTM message <input type="checkbox"/> Uplink FLY HEADING 180 message	um190
3.	Air	Upon receipt of uplink FLY HEADING 180 message <input type="checkbox"/> Send a STANDBY response <input type="checkbox"/> Send a WILCO response	dm2 dm0

- Previous Scenario was repeated*
- Data Link was lost for a few minutes over*

*France and several times in Spain*

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# *CPDLC Test*



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## *28 January: PMI-ORY-PMI*

*A 4 sec difference between  
Aircraft FMC and Ground  
was noticed*



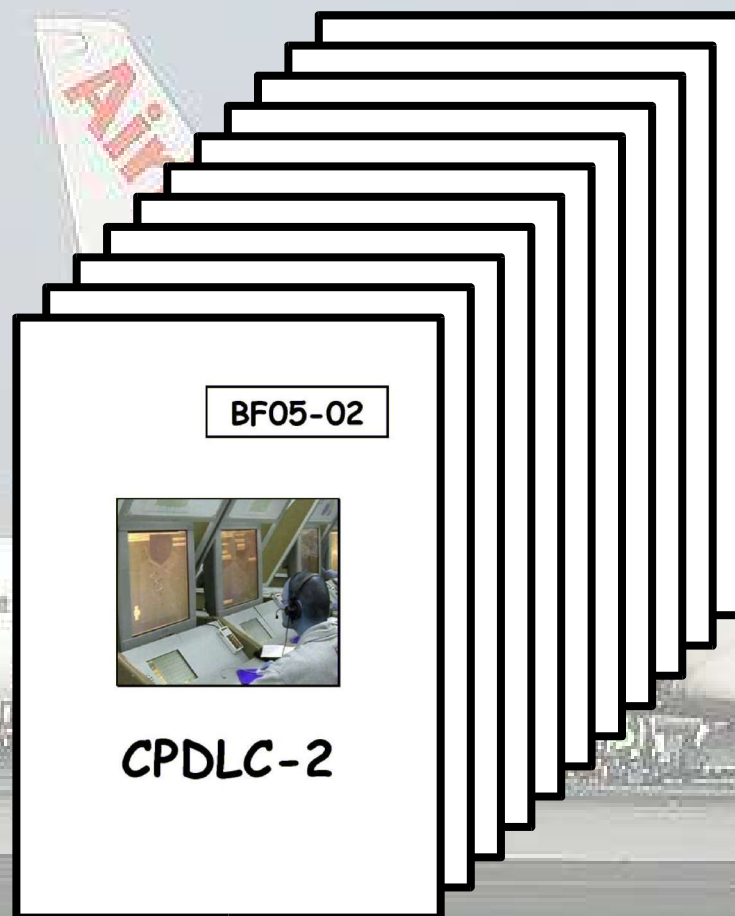
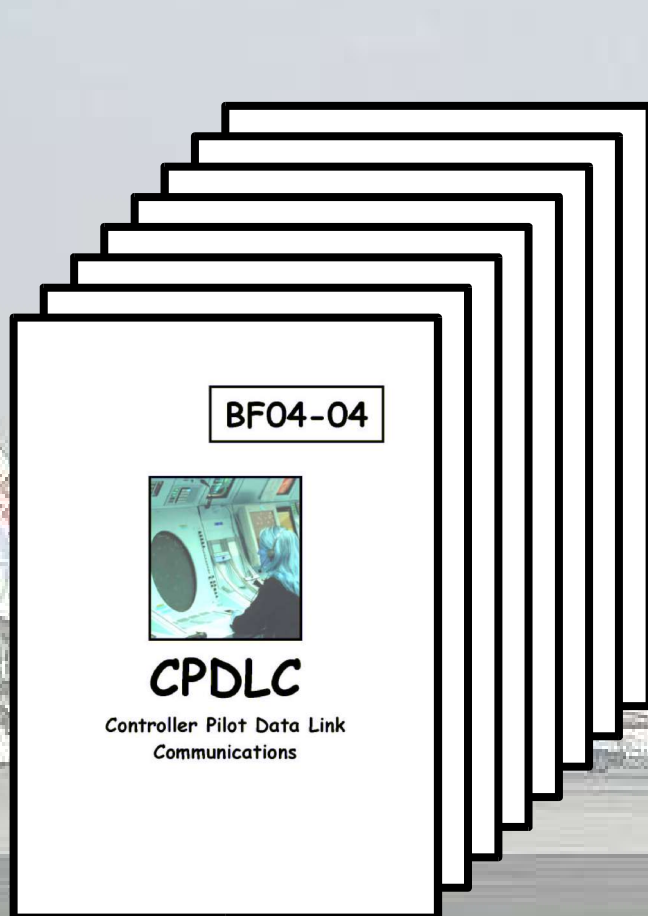
- Reason: CMU was not reading Time data from the FMC*
- Solution: CMU software change to allow CMU use FMC time data*



## *18 February: MAD-ORY-MAD*

- *A DGAC Inspector flew on board*
- *Everything went according to plans*
- *D-ATIS was used*
- *Departure Clearance (DLC) could not be obtained*

# *Crew Training*



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# *Crew Training*



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# ***DGAC Authorisation***

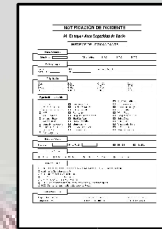
***1. Ops Manual Inclusion .....***

***.....V***



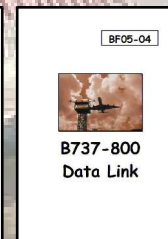
***1. Incidents Report Format .***

***.....V***



***1. Crew Training .***

***..V***



***1. Verification Flight .. (18 Feb 05) .....***

***.....V***

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# ***DGAC Authorisation***

Therefore, Spanish CAA considers that Air Europa has addressed the relevant operational considerations to use, according to the Eurocontrol LINK 2000+ Programme, Controller Pilot Data Link Communications (CPDLC), and takes down the beginning of CPDLC operations as a supplementary means of communication to voice, without replacing voice as a primary means of communication.

***DGAC CPDLC Operation for B737 Letter was approved on 18 April 2005***

***¡¡ Ready to overfly Maastricht !!***

# *Future Objectives*

- *First CPDLC over Maastricht*
- *Crew experience*
- *ACARS optimisation*
- *FANS A (A340-200)*
- *FANS A+ (A330-200)*
- *FANS B (A350-800)*
- *ADS B ??*

# Summary

- *Good news:*
  - *6 Aircraft fully CPDLC equipped*
  - *6 Aircraft retrofit beginning Nov 05*
  - *New Aircraft expected soon*
  - *ACARS server operational*
  - *We are “on the right track”*
- *Bad news:*
  - *AENA delayed CPDLC implementation til 2011 (first 2007, then 2009, 2011??)*



# ***Voice & Video Comparison***

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*We, at Air Europa, look the  
future with enthusiasm*



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