

	AUTO FLIGHT ACARS INTERFACE		1.22.45	P 1
			SEQ 100	REV 10

GENERAL

The FMS ACARS function gives an interface between a ground station and one onboard FMGC, allowing data transmission between these two computers via the ACARS Management Unit.

Two different sets of message can be exchanged :

UPLINK messages from the ground station. They consist in reception of data requested or directly sent to the crew.

DOWNLINK messages from the FMGC (master). They consist in reports or requests sent to the ground station.

The FMGS/ACARS interface enables the following ACARS capabilities.

- F-PLN initialization (flight plan and performance data)
- Takeoff data
- Wind data
- Flight reports
- Broadcast data

Crews can send message using ACARS function pages or relevant MCDU pages.

Only one FMGC talks to the ground station. This FMGC is called FMGC “master”.

GENERAL SCRATCHPAD MESSAGES

- | | | |
|----------------------|---|--|
| NOT XMITTED TO ACARS | : | A crew request or report was sent to the ground but the communication was not established or not acknowledged. |
| NO ANSWER TO REQUEST | : | A crew request was previously sent to the ground and no answer (uplink message) was received within 4 minutes. |

FLIGHT PLAN INITIALIZATION FUNCTION

This function enables lateral and vertical flight plan data as well as performance data to be exchanged between the aircraft and a ground station. The aircraft may send flight plan requests for active and secondary flight plan. (downlink messages). The ground station may send flight plan and performance data (uplink messages) either under aircraft request or automatically without any request. Each uplink message concerns either the active or secondary flight plan but never both flight plans at the same time. The data sent to the aircraft are checked for flight plan consistency. A MCDU message comes up when an uplink message is received. "ACT (or SEC) RTE UPLINK". If an error prevents the decoding process of the message, "INVALID RTE UPLINK" is displayed on MCDUs. An uplink message can be routed to the active flight plan if no engine is started and no active flight plan exists. Otherwise, it is routed to the secondary. The crew will insert it into the secondary flight plan or will reject it using the CLR key.

Note : The flight plan may also be initialized using the ACARS function page selected from DATA INDEX page.

1L

2L

3L

4L

5L

6L

ACARS FUNCTION 1/2 →

UPLINK

F-PLN INIT REQ*

TO DATA REQ*

WIND DATA REQ*

PRINT

<RETURN FUNCTION>

1R

2R

3R

4R

5R

6R

ACARS FUNCTION PAGE 1
(FROM DATA INDEX)

FFCS-01-2245-002-A 100AA

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PERFORMANCE DATA

On ground and before engine start, the ground station may also send performance data to the aircraft. Performance data are always associated with the uplink flight plan. It is either automatically inserted with the active flight plan data, or stored in the secondary with the corresponding flight plan.

This message contains part or all of the following data :

ZFW, ZFWCG, taxi fuel, block fuel, cruise flight level, tropopause altitude, cruise temperature, transition altitude, cost index, performance factor.

Note : After engine start an uplink performance data message is rejected automatically without any scratchpad message.

SCRATCHPAD MESSAGES RELATED TO FLIGHT PLAN AND PERFORMANCE

INVALID RTE UPLINK	An error is detected, the uplink message is rejected.
ACT or SEC RTE UPLINK	A F-PLN is stored in the active or secondary flight plan.
FLT NUMBER UPLINK	FLT NBR has been initialized within a F-PLN message without previous request.
CHECK FLT NUMBER	The uplinked FLT NBR differs from the one specified in the request.
CHECK CO RTE	The uplinked CO RTE ident differs from the one specified in the request.
INVALID FLT NBR UPLINK	The uplink contains a valid F-PLN but the FLT NBR is invalid.
PERF DATA UPLINK	Performance data is received
INVALID PERF UPLINK	Performance uplink message has been rejected
RTE DATALINK IN PROG	A flight plan modification is performed after a F-PLN INIT request has been sent ; this message is displayed until the uplink is received.
UPLINK INSERT IN PROG	This message is displayed during insertion of a Flight Plan.

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TAKEOFF DATA FUNCTION

The takeoff data function is available for the active flight plan only. It is used to request to the ground station, information data for up to 2 runways and to receive this data for up to 4 runways.

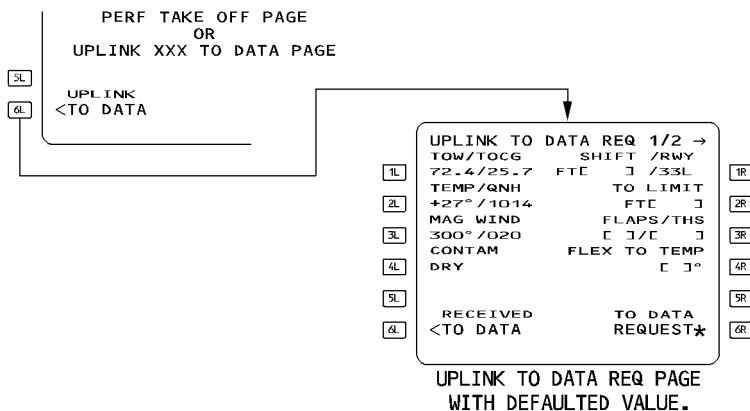
The crew sends a request indicating the departure airport, runway idents, CG, GW and weather conditions (such as baro setting wind, temperature...). In response he receives the takeoff speeds for up to 4 runways but only one set of data may be inserted in the active flight plan for the selected active runway.

Takeoff speeds are computed for max and flex takeoff.

The takeoff data function has required the modification of the standard PERF TAKEOFF page and the addition of 2 news pages :

- UPLINK TO DAT REQ page that enables the crew to specify a request to the ground.
- UPLINK XXX TO DATA page (XXX for MAX or FLEX)

These 2 pages are accessed from the PERF TAKEOFF page in PREFLIGHT and DONE phase only.



SCRATCHPAD MESSAGES RELATED TO TAKEOFF DATA

- TAKEOFF DATA UPLINK : Takeoff data uplink message is received
- INVALID TAKEOFF UPLINK : The UPLINK message is rejected

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WIND DATA FUNCTION

This function enables the crew to request and to receive forecasted winds associated to the active or secondary flight plan.

The uplink message (ground station to aircraft) may be received upon crew request or automatically without crew request.

The request is initiated from WIND pages or from ACARS FUNCTION page (Refer to 4.03.20).

The uplink wind data when received are directly displayed on the wind pages but not inserted in the flight plan, one set for each flight phase : CLIMB, CRUISE, DESCENT. The alternate wind at alternate cruise flight level is displayed on DESCENT page.

- * Winds are associated to altitude for climb and descent phases
- * Winds are associated to four altitudes for each waypoint for cruise phase and step level.
 - On ground and without entered winds (except the trip wind), an uplink message is directly inserted in the flight plan.
 - In flight, winds are temporarily stored until the crew inserts them phase per phase.
Phase of flight is indicated in the WIND title page.
 - Clearing the INSERT UPLINK* prompt using the CLR key deletes the uplink wind data for the selected phase.

When uplink winds are deleted, the wind page reverts to the previous status.

The flight plan B page is modified of the uplink wind only after it is inserted by the crew. ACARS uplink winds are then considered as crew manual entries (large font).

SCRATCHPAD MESSAGES RELATED TO WIND DATA

INVALID WIND UPLINK	An error is detected, the uplink is rejected.
WIND DATA UPLINK	Uplinked winds are received.
WIND UPLINK PENDING	A temporary flight plan exists or a DIR TO page is displayed when a wind uplink is received. The message is stored.
WIND UPLINK EXISTS	A F-PLN modification (active or secondary) is attempted when uplink winds are not inserted. This message disappears automatically when the wind uplink is inserted or deleted.
CHECK DEST DATA	The aircraft is at 180 NM from destination, and the destination QNH, TEMP or WIND displayed on the PERF APPR page was received by ACARS uplink or, if following insertion of a descent wind uplink, a conflict concerning the above parameters exists.
CHECK ALTN WIND	The uplinked alternate cruise flight level differs from the default alternate cruise flight level.

FLIGHT REPORTS

Flight reports provide real time information to the ground concerning the aircraft current situation and position.

Several types of flight reports are available :

- The Position report : provides current aircraft position
- the Progress report : provides data relative to the destination
- The Flight-Plan report : provides the active route
- the Performance Data report : provides performance data currently used by FMS.

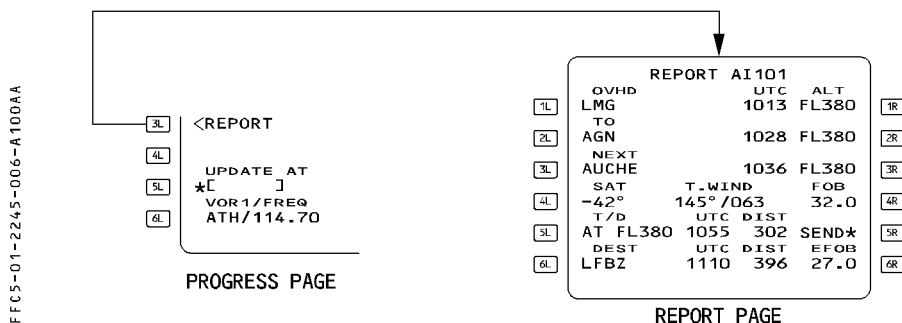
These reports may be manually initiated via a dedicated prompt or automatically sent in response to a ground request or upon specific conditions.

POSITION REPORT

This report is sent :

- manually via a MCDU prompt or
- following a ground request or
- automatically upon sequencing a designated reporting fix (designated by the ground in a uplink message).

The manual POSITION REPORT downlink prompt is displayed on the REPORT page POS prompt.



Note : Position report are initiated from active flight plan only.

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POSITION report content

The downlinked message contains exactly the REPORT page data.

PROGRESS REPORT

A progress report contains data relative to the aircraft arrival time and EFOB at destination for the active F-PLN.

This downlink message is automatically sent following :

- a ground request or
- a change of destination or
- a change of runway or
- a specific event. The possible events that can be selected in the navigation database policy file are :
 - X minutes to Top of Descent
 - Z minutes to Destination
 - ETA changes more than W minutes from the previous report.

X, Z and W are minutes of time set in the navigation database policy file.

The progress report cannot be manually sent by the crew via a dedicated MCDU prompt.

PROGRESS report content

- Flight Number
- Arrival Airport Ident
- Destination Runway Ident
- Predicted remaining fuel
- ETA at destination
- Reason for report (specific event, ground request...).

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FLIGHT PLAN REPORT

The F-PLN report broadcasts flight plan data to the ground. Only data from the active flight plan can be sent.

This downlink message is sent to the ground :

- automatically following a ground request
- manually by the crew using a prompt displayed on the ACARS FUNCTION page. (Refer to ACARS page description). This prompt may be invalidated through the navigation database policy file.

The Flight Plan report can be downlinked either while on ground or in flight during any flight phase.

FLIGHT PLAN report content

The report contains the active and alternate flight plan.

PERFORMANCE DATA REPORT

The Performance Data report is a downlink message that allows the transmission of performance data (GW, FUEL, CG...) relative to the active F-PLN.

This message is automatically sent following a ground request. Manual sending is not possible.

PERFORMANCE DATA report content

Sends to the ground :

- Current GW
- Cruise Altitude
- Current CG
- Fuel on Board
- Block Fuel
- Reserve Fuel
- Cost Index
- Top of Climb Temperature
- Climb Transition Altitude
- Tropopause Altitude
- Taxi Fuel
- ZFW
- ZFWCG