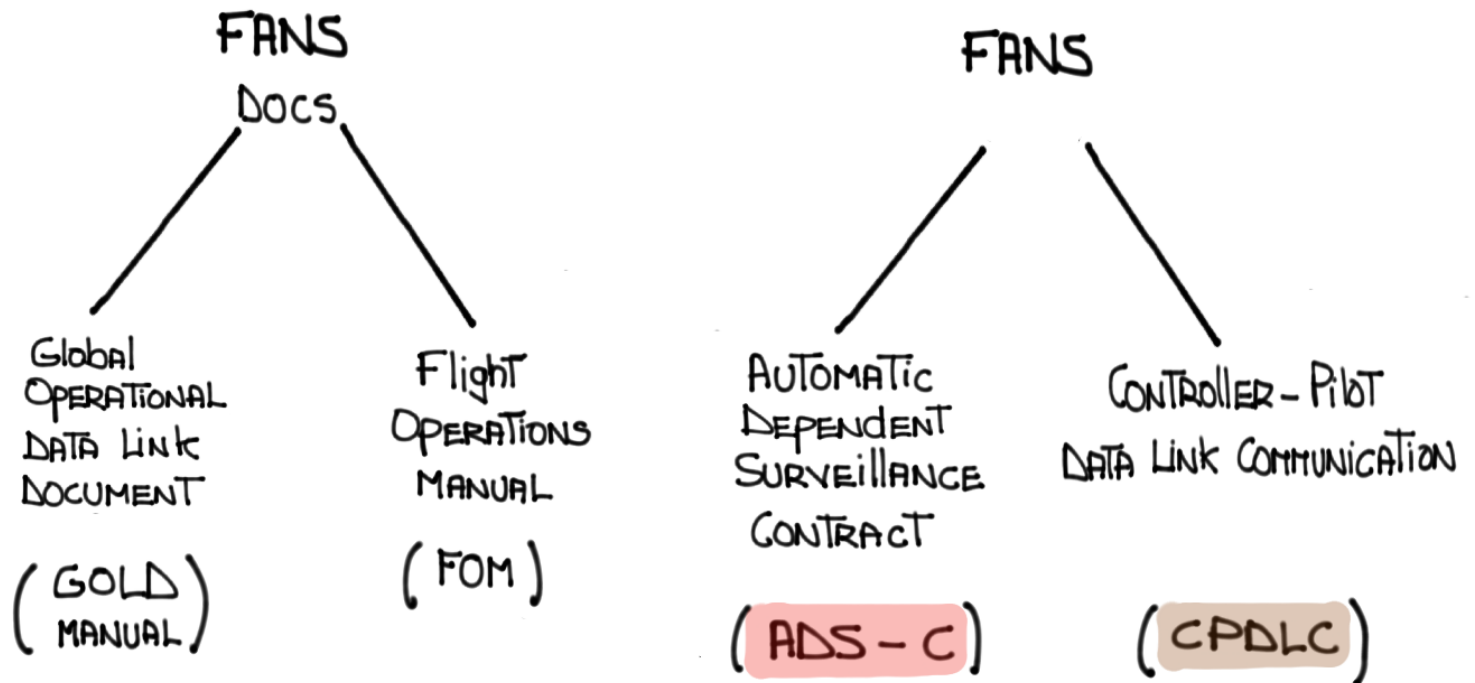


FUTURE Air Navigation System (FANS)

FANS IMPROVES COMMUNICATION BETWEEN ATC AND PILOTS BY PROVIDING A LANGUAGE THAT IS NOT AFFECTED BY ACCENTS OR LANGUAGES



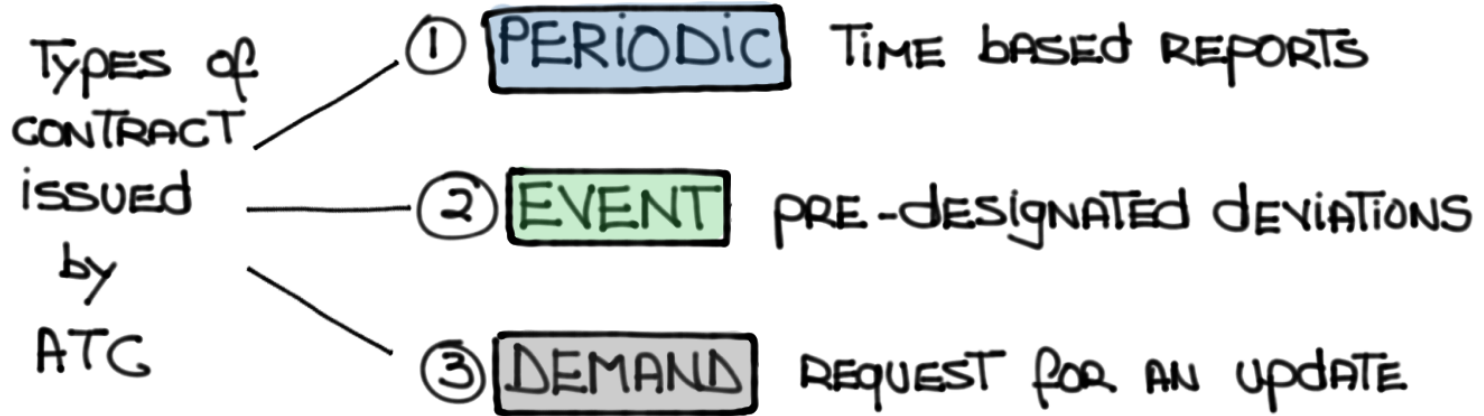
GOLD = GUIDANCE/INFORMATION ON DATA LINK OPERATIONS

FOM = CARRIER-SPECIFIC TRAINING AND SOPs

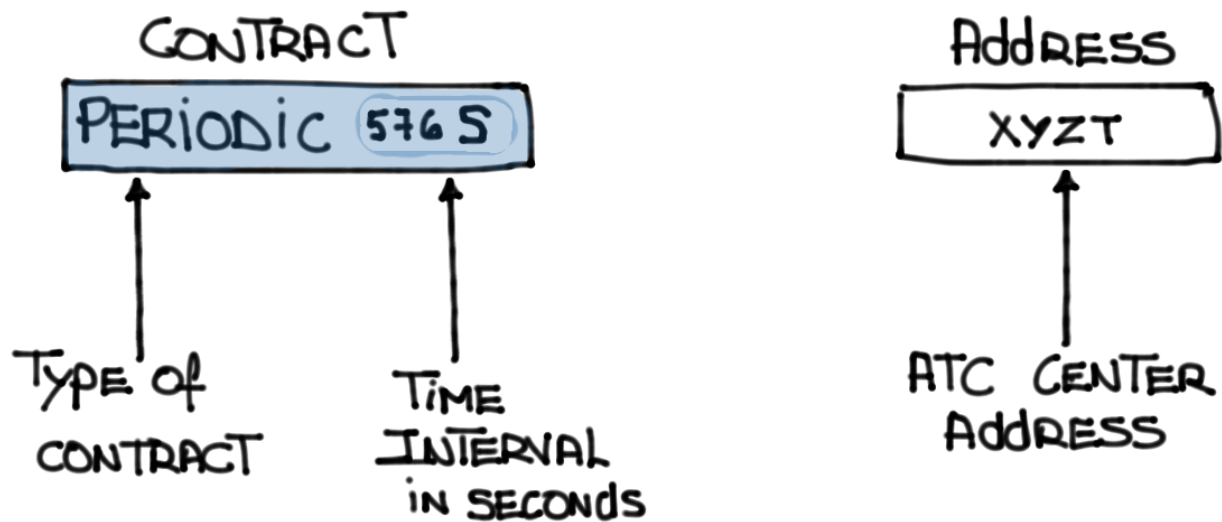
ADS-C = HOW ATC COMMUNICATES WITH AIRCRAFT

CPDLC = HOW ATC COMMUNICATES WITH CREW

AUTOMATIC DEPENDENT SURVEILLANCE - CONTRACT



ADS REVIEW 1/3



MESSAGE CONTENT:

Flight ID = Tail number / call sign

EARTH REF = TRUE TRACK, ground speed and vertical rate

METEORO = wind speed / direction and temperature

Pred ROUTE = Flight plan or predicted route

LAT / LON, ALTITUDE and ETA to next waypoint

Air REF = TRUE heading / Mach speed

AC INTENT = PRESENT position / altitude

ADS REVIEW 2/3

CONTRACT

EVENT

↑
Type of
CONTRACT

Address

XYZT

MESSAGE CONTENT:

AUTOMATICALLY SENT TO THE CONTROLLER WHEN AN AIRCRAFT STRAYS FROM ITS ATC CLEARANCE. THIS TYPE OF CONTRACT WILL OCCUR WHEN A DEVIATION IS DETECTED IN VERTICAL RATE, LATERAL DEVIATION, ALTITUDE OR WAYPOINT INSERTION ERROR

IF AN EVENT CONTRACT IS TRIGGERED IT SENDS A RED FLAG TO THE CONTROLLER TO ALERT HIM/HER THAT SOMETHING IS WRONG.



ALTITUDE DEVIATION

ADS REVIEW 3/3

CONTRACT
DEMAND

ADDRESS

XYZT

↑
TYPE OF
CONTRACT

MESSAGE CONTENT:

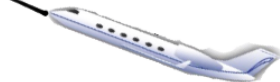
NORMALLY A ONE-TIME EVENT FOR A PARTICULAR CHANGE.
EXAMPLE: WHEN AIRCRAFT REACHES A NEWLY ASSIGNED
FLIGHT LEVEL, AS PER A NEW CLEARANCE.

39,000'

FL390



CLIMB FL390



35,000'

THE ONLY TYPE OF CONTRACT CONTROLLED BY THE PILOT IS:
MAYDAY MESSAGE

DATALINK (TRANSCRIBED FROM FSI)

- AIRCRAFT APPROACHING THE FIRST NAT FIR SHOULD CARRY OUT AFN LOG ON 15-45 MINUTES BEFORE OCEANIC BOUNDARY
- THE ATC GROUND SYSTEM CORRELATES THE LOG ON WITH THE AIRCRAFT'S FLIGHT PLAN AND/OR CLEARANCE, AND EITHER ACCEPTS OR REJECTS THE LOG ON
- IF IT IS NOT APPARENT WHY A LOG ON HAS BEEN REJECTED AND THE APPROPRIATE PROCEDURES HAVE BEEN ADHERED TO, THE PILOT SHOULD QUERY THE REJECTION BY VOICE
- LOG ON NOTIFIES ATC THAT AIRCRAFT IS AVAILABLE FOR ADS AND CPDLC
- THE GROUND SYSTEM ISSUES AN ADS CONTRACT AT AN APPROPRIATE TIME AND FOR THIS THE ANIONICS WILL MAKE REGULAR POSITION REPORTS WITHOUT PILOT INTERVENTION
- THE GROUND SYSTEM MAY ALSO ESTABLISH A CPDLC CONNECTION

- The ATC unit establishing the connection becomes the **CURRENT DATA AUTHORITY (CDA)** and is the only ATC unit that can exchange **CPDLC** messages with the aircraft
- Pilots expecting to have a **CPDLC** connection should check that the correct FIR is shown as the active center
- As the aircraft approaches the next NAT FIR the system notifies the avionics that XYZC is the **NEXT DATA AUTHORITY (NDA)**
- The system then instructs the avionics to initiate AFN log on with the next ATC unit. This process does not require any pilot action
- The next unit can issue another **ADS** contract and set up a **CPDLC**, but cannot yet exchange **CPDLC** messages
- A SELCAL check must be initiated with each FIR boundary

- NEAR THE boundary TO THE NEXT FIR AN "END" MESSAGE will be SENT by THE CDA. This closes THE CONNECTION WITH THAT ATC UNIT AND THE NDA BECOMES THE CDA AND CAN EXCHANGE CPDLC MESSAGES WITH THE AIRCRAFT. AN ADS REPORT will be SENT TO BOTH UNITS AT THE boundary, AND THEN THE PREVIOUS ATC UNIT will CANCEL ITS ADS CONTRACT
- OCCASIONALLY A LOSS OF COMMUNICATION PREVENTS THIS TRANSFER OF COMMUNICATION PROCESS FROM BEING SUCCESSFULLY COMPLETED. Pilots should check A FEW MINUTES AFTER ENTERING A NEW FIR THAT THEY HAVE A CPDLC CONNECTION WITH THE CORRECT UNIT. IF THEY DON'T AND ATC HAS NOT ADVISED THAT TRANSFER HAS BEEN DELIBERATELY DELAYED, THEY SHOULD SELECT ATC COMM OFF AND LOG ON TO THE NEW FIR
- EVEN THOUGH DATALINK HAS BEEN USED FOR ENROUTE COMMUNICATIONS THE INTEGRITY OF THE SERVICE IS ENSURED BY VOICE CONTACT WITH ATC
- PRIOR TO ENTERING EACH NAT FIR PILOTS MUST ENSURE THAT THEY CONTACT THE APPROPRIATE RADIO STATION

15-45 MINUTES < FIR boundary

XYZT

FIR



CREW LOGS ON XYZT

LOG ON "ACCEPTED"

XYZT = CDA

"ATC COMM ESTABLISHED"

* "ATC COMM ESTABLISHED" = CPDLC

JUST PRIOR XYZT FIR



XYZT

FIR

VHF/HF SELCAL CHECK
WITH XYZT ATC

Approaching NEXT FIR

WZTX



FIR

AVIONICS LOGS ON WZTX

XYZT = CDA

WZTX = NDA

WZTX SETS UP ADS CONTRACTS

XYZT
FIR

JUST PRIOR WZTX FIR

WZTX



VHF/HF SELCAL CHECK
WITH WZTX ATC

FIR

XYZT SENDS "END" MESSAGE

WZTX = CDA

AVIONICS MAKES
POSITION REPORT

— XYZT

— WZTX

XYZT CANCELS CONTRACTS

JUST AFTER WZTX FIR



CREW CONFIRMS:
"ATC COMM ESTABLISHED"
WITH WZTX

|
|
WZTX |
|
FIR |

If NOT:

SELECT ATC COMM off
Log ON To WZTX

|
|