FANS improves communication between ATC and pilots by providing a language that is not affected by accents or languages.

\[
\text{FANS}
\begin{align*}
\text{Docs} & \quad \text{FANS} \\
\text{Global Operational Data Link Document} & \quad \text{Controller-Pilot Data Link Communication} \\
(\text{GOLD}) & \quad (\text{CPDLC}) \\
(\text{MANUAL}) & \\
\text{Flight Operations Manual} & \\
(\text{FOM}) & \\
\text{Automatic Dependent Surveillance Contract} & \\
(\text{ADS-C}) &
\end{align*}
\]

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

Types of contract issued by ATC:
1. **PERIODIC** - Time based reports
2. **EVENT** - Pre-designated deviations
3. **DEMAND** - Request for an update

ADS REVIEW 1/3

**CONTRACT**

- **PERIODIC** 576 S

**ADDRESS**

- **XYZT**
  - ATC Center Address

**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
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. FL 390 - 39,000' altitude deviation.
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.

\[39,000\,\text{ft} \rightarrow \text{FL390} \rightarrow \text{Climb FL390} \rightarrow 35,000\,\text{ft}\]

The only type of contract controlled by the pilot is: \textbf{MAYDAY MESSAGE}
- 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 avionics 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

Crew logs on XYZT
Log on "Accepted"

XYZT = CDA
"ATC COMM ESTABLISHED"

"ATC COMM ESTABLISHED" = CPDLC

Just prior XYZT FIR

VHF/HF SELCAL Check
with XYZT ATC
Approaching next FIR

Avionics logs on WZTX
WZTX = NDA
WZTX sets up ADS contracts

Just prior WZTX FIR

VHF/HF SELCAL check with WZTX ATC

XYZT sends "END" message

WZTX = CDA
Avionics makes position report
XYZT cancels contracts

XYZT = CDA

FANS: ADS-C and CPDLC 9 / 10 4/6/17
JUST AFTER WZTX FIR

Crew confirms:
"ATC COMM ESTABLISHED" with WZTX

If not:
Select ATC COMM off
Log on to WZTX