Aviation Communications

- **Mediator**  
  John Mettrop  
  UK Civil Aviation Authority  
  Chairman Working Party 5B

- **Speakers**  
  Claude Pichavant  
  Airbus

  Joseph Cramer  
  Boeing

  Raffi Khatcherian  
  Eurocontrol

  Thomas Weber  
  European Communication Office
Evolution of Aviation
# ICAO Standardised Systems

<table>
<thead>
<tr>
<th>Year</th>
<th>NAV</th>
<th>COM</th>
<th>SUR</th>
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<tbody>
<tr>
<td>1950</td>
<td>ILS</td>
<td>VOR</td>
<td></td>
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<tr>
<td>1951</td>
<td>HF</td>
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<tr>
<td>1952</td>
<td>NDB</td>
<td>DME</td>
<td>VHF Marker</td>
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<td>1955</td>
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<td>SSR</td>
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<td>1968</td>
<td>Loran</td>
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<tr>
<td>1983</td>
<td>MLS</td>
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<tr>
<td>1995</td>
<td>Satellite</td>
<td></td>
<td>ACAS (TCAS)</td>
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<tr>
<td>1996</td>
<td>GNSS</td>
<td>VDL 2</td>
<td>Mode S</td>
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<tr>
<td>1999</td>
<td>HF Datalink</td>
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<tr>
<td>2001</td>
<td>GBAS</td>
<td>VDL 3</td>
<td>VDL 4</td>
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<tr>
<td>2002</td>
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<td>ADS-B</td>
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</table>

**1995**
- Satellite
- ACAS (TCAS)

**1996**
- GNSS
- VDL 2
- Mode S

**1999**
- HF Datalink

**2001**
- GBAS
- VDL 3
- VDL 4

**2002**
- ADS-B
Resultant Aircraft Fit

29 Antenna covering 3 basic Functions Communication/Navigation/Surveillance
Commercial Aviation by the Numbers

51,554 Routes Globally
3.3 Billion Passengers
32.8 Million Commercial flights
1,402 Commercial Airlines
26,065 Commercial Aircraft in Service
3,883 Airports with Commercial Flights
173 Air Navigation Service Providers

Figures given are for 2014
Commercial Aviation - Jobs

Figures given are for 2014
GLOBAL IMPACT

- $2.7 Trillion
- 3.5% of Global GDP
- As a State Ranked 21\textsuperscript{st} based on GDP

Figures given are for 2014
The Future

Aviation

Manned

Remotely Piloted

Space Planes

Rationalisation/Modernisation

Global Aeronautical Distress & Safety Service

Command & Control

Sense & Avoid

High Altitude Platforms

Military

Commercial

Business

General Aviation
Approach
Glossary

**ACAS:** Automatic collision avoidance system

**ADF:** Automatic direction finding

**ADS-B:** Automatic dependent surveillance- broadcast

**DME:** Distance measuring equipment

**GBAS:** Ground based augmentation system

**GDP:** Gross domestic product

**GNSS:** Global navigation satellite system

**GPS:** Global positioning system

**HF:** High frequency

**ILS:** Instrument landing system (Loc: localiser, G/S glide slope)

**MLS:** Microwave landing system

**NDB:** Non-directional beacon

**RA:** Radio altimeter

**SSR:** Secondary surveillance radar

**TCAS:** Tactical collision avoidance system

**VDL:** VHF data link

**VHF:** Very high frequency

**VOR:** VHF omni-ranging