

controllers are able to communicate with flight crews using a data link texting facility to ensure accurate data transfer for air traffic management.

Airline operations centers benefit from more efficient operation, and thus reduced costs, with more effective communication with their airplanes.

Automatic surveillance of airplanes by air traffic centers also provides controllers with much more accurate airplane position, intended flight path, airplane attitude and flight details. The ATIMS consists of an Air traffic

Service Unit (ATSU), two Datalink Control and Display Units (DCDU) located in the flight deck for captain and first officer, two air traffic control message pushbutton switches and a switch to reset the ATSU. The airplane Multipurpose Control and Display Units (MCDU) are used by maintenance crews to interface with the ATIMS.

AIR TRAFFIC SERVICE UNIT (ATSU)

The Air Traffic Service Unit is loaded with various software applications used to manage data to and from the airplane for air traffic control purposes. The software packages are loaded and updated via a Multipurpose Disk Drive Unit (MDDU). The software loaded into the ATSU includes ATSU Airplane Interface software, ATSU configuration software, ATSU router software, Airline Operation Control software, Airline Operation Control databases, ATC FANS A+ applications.

The ATSU Airplane Interface software provides functionality for monitoring the ATIMS, acquiring airplane parameters and controlling air/ground communications. The ATSU configuration software contains files for the Air Traffic Control and Airline Operations Control communications settings. The ATSU router software holds the worldwide Datalink Service Provider database.

Airline Operation Center datalink applications provide airlines with means to send and receive operational data. This data would include flight plans, system status for maintenance and general airplane management. The ATC FANS A+ application package provides applications associated with the control and transfer of data for Air Traffic Control purposes. These applications enable communications with the ATC ground station using datalink instead of voice communications. Uplink messages are displayed on the Datalink Control and Display Units in the flight deck which are managed in order of priority and, where applicable, are loaded into the airplane avionics systems. Downlink messages are

configured through the MCDU and displayed on the DCDU for checking by the crew before transmission.

The FANS A+ application package also enables the Air Traffic Control center to receive airplane identification and four-dimensional position reports for surveillance purposes.

- A Departure Clearance (DC) application automatically generates requests for departure information and clearance.
- An Oceanic Clearance (OC) application automatically generates requests for oceanic clearance prior to entering oceanic airspace.

The Air Traffic Service Unit communicates with airplane avionics systems using an ARINC 429 bus interfacing with:

- Datalink Control and Display Units
- Flight Management Guidance and Envelope Computers
- Multipurpose Control and Display Units
- VHF Datalink communications
- HF Datalink communications
- SATCOM
- Cabin Terminals
- Radio Management Panels
- Data Management Units
- Flight Warning Computers

- Data Acquisition Concentrators
- ATC Transponders
- Central Maintenance Computers
- Multipurpose Disk Drive Units
- Flight Deck Clock

DATALINK CONTROL AND DISPLAY UNITS (DCDU)

The information displayed on the DCDU (Figure 22-9) provided to the flight crew from the ATC ground centres and enables the crew to send responses to ATC messages received. All information displayed on the DCDU is managed and controlled by the ATSU.

Flight crew are alerted of a message by the illumination of ATC message pushbutton switches and are accompanied by an audible alert generated by the Flight Warning Computer. The audible alerts may be single chime or a repetitive chime depending on the message priority.

MULTIFUNCTION CONTROL DISPLAY UNIT (MCDU)

Communication with Airline Operations is achieved through use of the MCDU where messages are prepared and/ or edited before sending. ATIMS software applications can also be configured using the MCDU.

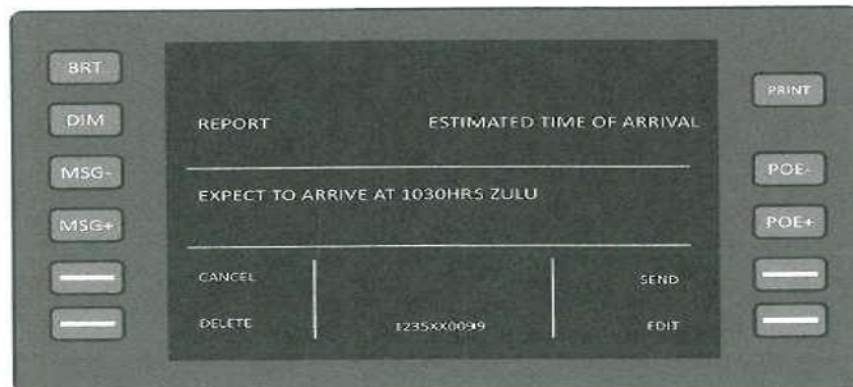


Figure 22-9. Datalink control and display unit.