Data link case study

Education

The Importance of Data LinkCommunicationin Aviation Matthew D. Palmer Embry-Riddle Aeronautical University Abstract This paper explores the importance of data link communication in aviation. The importance of these systems and their positive outcomes to the aviation world are also covered. Authorities such as the Federal Aviation Administration, EuroControl, and military departments will be used to show different aspects of data links importance. The importance of each department and its specific use of data link systems is defined and elaborated on.

Though each specific department varies its use of the system, the aviation world is becoming safer as they progress their programs. The importance of Data Link Communication in Aviation Numerous studies have been conducted on the importance of data link communication and its application in aviation transportation. These studies are international and include all regions of airspace on the planet. Data link programs have proven effective in the areas of safety, efficiency, and military applications. Data link communication is the means of connecting one location to another for the purpose of transmitting and receiving information.

The aircraft flight management system gathers important flight information and transmits this information to ATC. This information is called a downlink. Once the information is organized by ground controllers, it sends navigation information to the aircraft to provide weather information and a safe flight path to its destination. This is called an uplink. Data link systems use a program called ACARS to send information. ACARS is a digital data system using the aircrafts VHF radio to communicate with operators using bursts of

data. The aviation world is quickly expanding with growth and technological advancement.

Data link systems have proven highly effective in increasing safety for airlines, air cargo operations, defense aviation, and leisure aviation. Safety is an immense priority for all aviation authorities. Data link systems have the ability to send information to pilots without worrying about interfering static, high communication volume, or dead spots. The system is ergonomically designed to be user friendly. Data is easily accessible and has a simultaneous send rate. As data link systems progress, they’re creating a more efficient way to travel or transport via aviation.

Organizations such as EuroControl have already started using data link systems for their efficiency. EUROCONTROL's mission is to harmonize and integrate air navigation services in Europe, aiming at the creation of a uniform air traffic management (ATM) system for civil and military users, in order to achieve the safe, secure, orderly, expeditious and economic flow of traffic throughout Europe, while minimizing adverse environmental impact. (SkyBrary, 2012) Now that flight plans are more closely monitored, EuroControl can set navigation plans in a “ straight-line” formation.

This will greatly save the airlines fuel, money, and travel time to and from destinations. Military organizations of the world also greatly rely on data link communication. By using encrypted data link messages, ground controllers can easily identify if an aircraft is an enemy or ally. Certain military data link applications such as Blue Force Tracker, and Hawklink, are used by NATO forces to send and interpret classified flight information. Pilots using Blue

Force Tracker are able to send messages to ground controllers and other aircraft through an electronic knee board.

The CDL Hawklink solution is a high speed, air-to-surface, digital data link that transmits data, imagery, electronic support measures, communications, and radar information gathered by the helicopter’s sensors to be multiplexed and transmitted in excess of 100 nm, at a rate of 10. 71 and 21. 42 megabits per second, to the host ship via the Ku-band link. (Harris Aviation, 2012). Both of these systems are extremely effective to their users while conducting combat operations. In conclusion, data link programs have proven effective in the areas of safety, efficiency, and military applications.

As these programs continue to advance, ground controllers can help reduce the frequency of potential accidents and incidents. References European Organization for the Safety of Air Navigation. (2012). retrieved September 30 2012, from http://www. skybrary. com Web Site: http://www. skybrary. com. aero/index. php/EUROCONTROL Ku-band Tactical Common Data Link (TCDL) Hawklink System—MH-60R LAMPS Helicopter. (2012). Retrieved September 30, 2012, from http://www. govcomm. harris. com Web Site: http://www. govcomm. harris. com/solutions/products/000074. asp