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INTELLIGENT METHOD OF FLIGHT DATAS RECORDING USING SATELLITE COMMUNICATION BY AVOIDING THE SEARCH OF BLACK BOX

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Abstract:

The aim of this proposal is to avoid the collection of flight data's from the black box when the flight crash happens. With any aero plane crash there are so many unanswered questions about how and why the airplane crash has happened. The hidden answers are inside the black box and the teams can search at a considerable cost to find black box. Instead of searching a black box we are providing the data's of the flight through the satellite communication and storing data's from ground station. Nowadays to find the black box when flights are crashed is too difficult due to environment condition, place identification, signal identification from the black box, etc., To avoid this problem we are going to design a proposal that will rectify the above problem, i.e. when the flight starts to run, the communication starts between flight to ground storage through satellite. The flight stores the data's in black box and also in ground to recover the data to avoid the black box searching with the help of the satellite.

Key Words: Flight, Black Box, Transponders, Satellite & Alternative Controller

1. Introduction:

The feasibility of transmitting data's from plane to ground stations in real time is investigated. Instead of waiting time to locate the black box, the valuable and all data information can be recovered instantly via the ground stations. This proposing system overcomes all disadvantages of the current system, such as time delay to finding the black box, cost of dispatching searching teams, Environmental conditions, place identification, signal identification from the black box, etc. A set of device is developed to cover the collection of flight data's; transmit it to the servers in ground stations through the satellite. The receiving data's will be compressed in the ground station in particular the memory allocations for reducing the time delay while transmitting and also reducing the storage space. We hope and believe that, this intelligent method of flight data's recording using satellite communication for avoiding searching of black box project will contribute towards saving human lives and improving the reliability and safety of aircrafts.

For the developing of proposed model the aircraft continuously sends the data's to the ground station through the satellite which is used to avoid the searching of the black box for getting the hidden and unanswered questions about the flight crashed. In future we develop the system in order to control the flight through the ground station with help of providing an alternative control system for individual flight.

Because there is a possibility available in satellite communication, we can continuously monitor the data's of flight. So we can know the conditions present in the flight. By providing of an alternative control system in the ground station we can

achieve the possibilities of avoiding and reducing the aircraft crash due to system failure. So this is the first step in moving forward to reduce the flight crash indirectly.

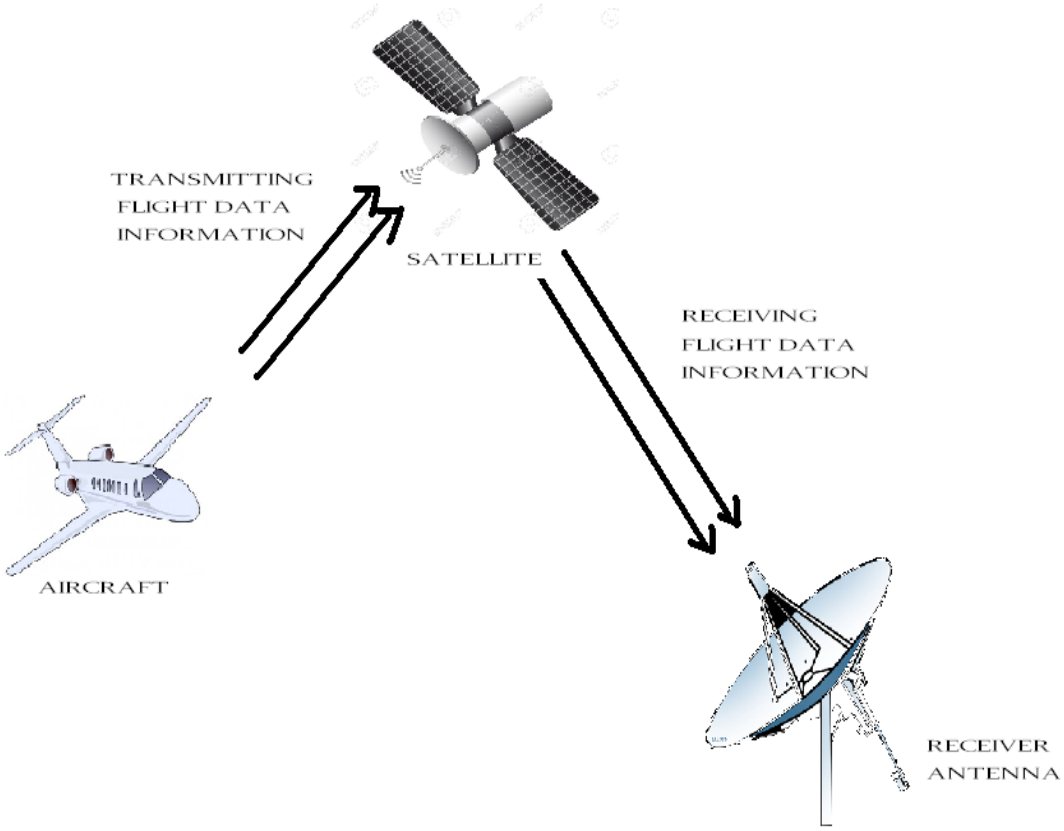

Figure 1.1: Basic Block Diagram of proposed Model

2. Proposed System:

The following methodology was presented and designed to develop the proposed model.

- Collection of Data's from flight
- Transmitting the data's to satellite
- Receiving and storage of data's in ground server

Collection of Data's From Flight:

The collection flight data's from various sensors as various parameters from the flight is the first step to design the proposed model. For the collection of data's we are using operational flight data monitoring (OFDM) and Flight Operations Quality Assurance (FOQA). For the controlling action like error identification, status checking of data monitoring, transmission and operations of data's, etc., we are providing the condition based controller. If any error occurs the controller will indicate the error signal and notify it. The transmitter section is used to signal conditioning, signal amplification, signal Modulation, packing of data's as signals in this section we can achieve this by having various device inside the transmitter.

The problem in collection of data's is the number of parameters and data's present in the flight. So we can collect the data's from various places in the flight through sensors and it can be easily pocketed or covered as a one signal by OFDM, FOQA and Transmitter section.

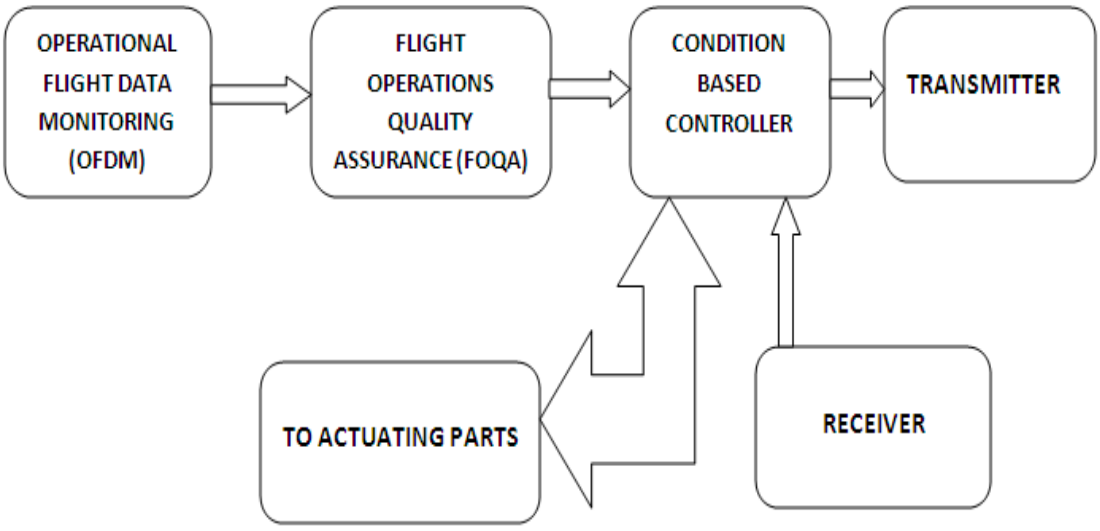

Figure 1.2: Collection of Data's and Transmission

Transmitting the data's to satellite:

The transmitting of data's to satellite is important to achieve the proposed design. Because existing system is providing the flight data's directly by sending it to ground station from the flight. There is more difficulty to receive and do the processing of data due to signal clarity, lack of signal, lack of communication, etc., so we can provide the communication between the flight and ground station through the satellite, because it can be reduce the traffic between the more number of flight communications and also lack of signal clarity. Not only for this but also we can continuously monitor the flight data's without compressing the signal.

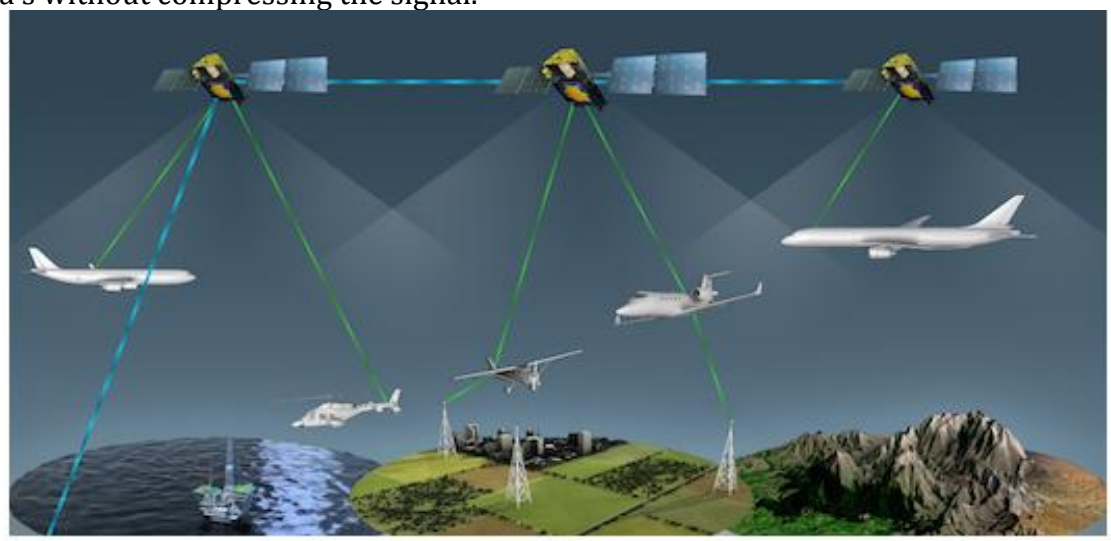

Figure 1.3: Signals from multiple aircraft

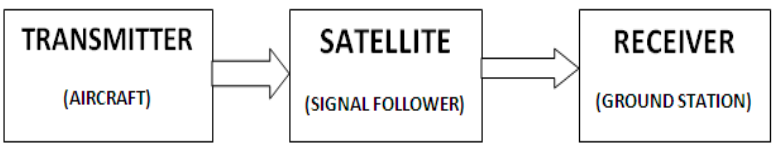

Figure 1.4: Block diagram for method of Signal Transmission

Receiving and storage of data's in ground server:

The receiving of signal from the flight through the satellite is continuously provided by the communication system. We are not compressing the signal when transmitting the data's as signal, because there is a possibility of time delay during compression of data's before transmission and also retrieving in the receiver side. And also during the compression of data before transmission there are possibilities of having error in the data during the data retrieving. But we have to save the memory location to avoid large number of storage to provide for one flight. So to avoid taking large number of storage for one flight we can compress the data's when we are going to save in separate server. It can reduce the time delay of retrieving the data's and also reduce the large space required for storage of the data.

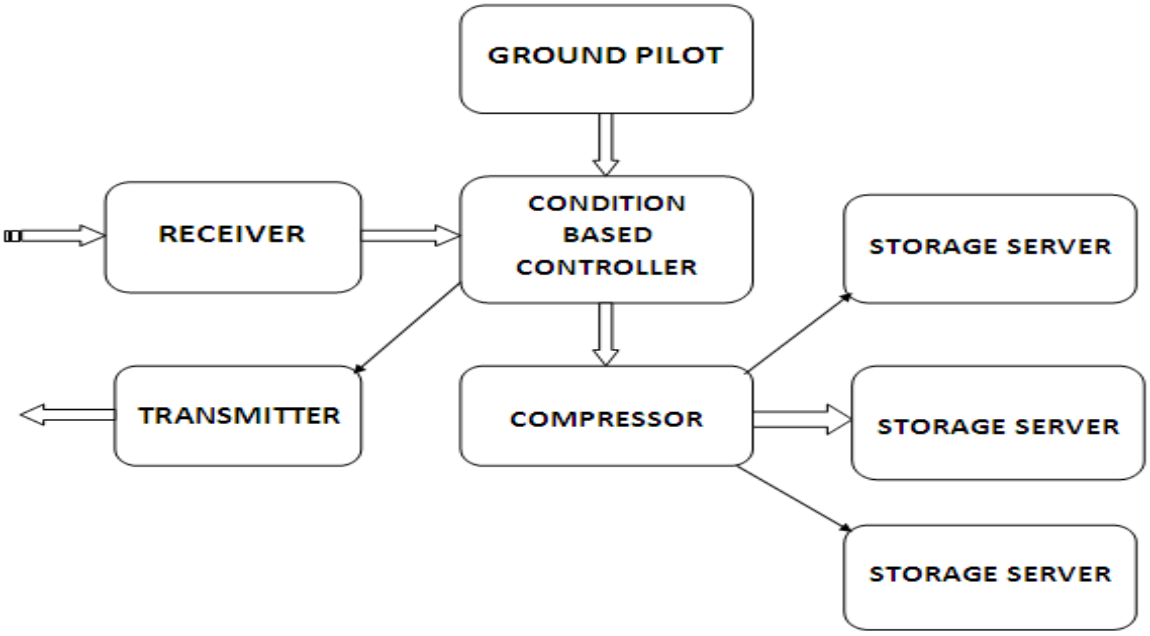

Figure 1.5: Block diagram for overview of Ground station

3. Results and Conclusion:

This proposed system eliminates the time delay the searching of black box, eliminates the black box system by providing an alternate controller from the ground station, from which there is a possibility of avoiding aircraft crash.

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