SUPPLEMENT S10

TO THE AIRPLANE FLIGHT MANUAL

DA 40 NG

FLIGHT DATA LOGGING DEVICE

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0.2 RECORD OF REVISIONS

Rev. No.	Reason	Chapter	Page(s)	Date of Revision	Approval Note	Date of Approval	Date Inserted	Signature

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1. GENERAL

This Supplement describes the function of the Flight Data Logging Device and supplies all information for the safe and efficient operation of the system. The Flight Data Logging Device is NOT covered by a TSO, but it has proven fire and crash resistance.

The Flight Data Logging Device is able to record audio signals and flight data. The recordings can be stored on a SD card and processed with an analysis software on a personal computer. The recordings are also stored in a hardened and fire proof unit.

The main applications of the Flight Data Logging Device are:

- Flight Data Monitoring
- Training Support
- Troubleshooting Assistance
- Incident/Accident Analysis

This Supplement is a permanent part of the AFM and must remain in the AFM at all times when the Flight Data Logging Device is installed. For specific information refer to the documentation of the Flight Data Logging Device manufacturer.

2. OPERATING LIMITATIONS

No change.

3. EMERGENCY PROCEDURES

No change.

4A. NORMAL OPERATING PROCEDURES

No change.

4B. ABNORMAL OPERATING PROCEDURES

No change.

5. PERFORMANCE

No change.

6. MASS AND BALANCE / EQUIPMENT LIST

6.5 Equipment List and Equipment Inventory

Airplane Serial No.:		Registration:		Date:	
Description	Type	Part No.:	Manufacturer	S/N	in-stalled
INDICATING / REC. SYSTEM					
Sensor Interface Unit		APICAP-003	iaero		
Power Supply Unit		APIPWR-001	iaero		
Data Retrieval Unit		APISD-001	iaero		
Memory and Data Processing Unit		APIV2-002-HARDEN	iaero		
CAN / ARINC Interface Unit		i2060-002	iaero		
EMI Filter		D44-2463-50-00	Diamond Aircraft		

7. DESCRIPTION OF THE AIRPLANE AND ITS SYSTEMS

7.13 FLIGHT DATA LOGGING DEVICE

GENERAL DESCRIPTION

The Flight Data Logging Device (APIBOX) is a solid state digital Flight Data Monitoring System designed for General Aviation use, allowing the recording of a very large number of aircraft and flight parameters as well as audio signals and to perform their analysis on the ground on a dedicated and user friendly software. Data is easily downloaded from the system after each flight using a standard SD card and can be reviewed on a personal computer through the use of an Analysis Software provided with the system.
Refer also to the iaero, APIBOX System, Diamond DA 40 NG User Manual.

SYSTEM OVERVIEW

The APIBOX SYSTEM consists of five main components:

- The Memory and Data Processing Unit (APIV2-002-HARDEN) receives digital raw data from the Sensor Interface Unit, converts them into directly readable parameters and stores them into the hardened and fire proof memory. Recorded capacity of the MDPU is very large, both in terms of audio signals and recorded parameters.
- The Power Supply Unit (APIPWR-001) is connected to the aircraft´s Battery Bus and Hot Bus and supplies 28V DC to the Memory and Data Processor Unit.
- The Sensor Interface Unit (APICAP-003) receives the aircraft analog and digital inputs as well as the pilot and copilot audio intercom unit signals and processes them into required formats before transmitting them to the Memory and Data Processing Unit.

- The CAN/ARINC Interface Unit (i2060-002) receives data from the engine CAN busses and from the Garmin G1000 via ARINC 429 busses.
- The Data Retrieval Unit (APISD-001), receives all data from the Memory and Data Processing Unit and stores the data on a removable SD card.

All components of the APIBOX SYSTEM are installed in the aft baggage compartment under the floor panel, just behind the left passenger seat.

WORKING PRINCIPALS

Data recording

The APIBOX SYSTEM is automatically switched ON when the aircraft Electric Master switch is selected to the ON position.
The shutdown of the APIBOX SYSTEM is not commanded directly by the pilot but by a set of conditions that must be met before the system turns itself off:

- Ground speed less than 5 kt
- No engine power
- Accelerometers "still" (no detection of movement)
- Airspeed less than 40 kt

Data are recorded and stored simultaneously and in real time in the crash and fire resistant memory of the Memory and Data Processing Unit and on the SD card inserted in the Data Retrieval Unit. All data are recorded at 1 Hz frequency except for load factors that are recorded at 8 Hz. Total recording capacity of FDR data is about 100 hours and the recording capacity of audio signals is about 50 hours. If one elects to conserve for example only the last 2 hours of audio recording, then system memory will store close to 1000 hours of airplane parameters.

Following parameters are recorded with the installed system:

- Accelerometers (1-4)
- Absolute pressure
- Differential pressure
- Engine type
- Engine number
- RPM
- Coolant temperature
- Power load
- Fuel pressure
- Battery voltage
- Oil temperature
- Oil pressure
- Gearbox temperature
- Fuel Flow
- Autopilot engage status (Optional)
- Flaps (Optional)

- Audio data

Minimum and maximum values of each parameter for each individual flight of the airplane are recorded and are stored for the whole life of the airplane/system. These stored data cannot be erased.

Data Downloading

Data can be downloaded manually using a removable SD card. Manual data download on the ground is done very simply by removing the SD card from the Data Retrieval Unit and then uploading them into almost any personal computer equipped with iaero's Analysis Software.

Data Analysis

Each APIBOX SYSTEM is provided with iaero's Analysis Software that can be installed on almost any personal computer. When data are uploaded from an SD card into a Personal Computer, the recorded data are analyzed by the program and displayed on a synthetic and user-friendly display.
Refer also to iaero, APIBOX SYSTEM documentation.

8. AIRPLANE HANDLING, CARE AND MAINTENANCE

No change.