

**Global NOTAC 24 - Issued under the Authority of:**

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**FLIGHT DATA MONITORING and FLIGHT OPERATIONS QUALITY ASSURANCE (FDM/FOQA)**

**Background Information:**

CAE OAA has introduced a form of Flight Data Monitoring/Flight Operations Quality Assurance scheme that follows global best practice to help ensure the effectiveness of safety awareness, compliance and training quality. It must be remembered that FDM/FOQA is a safety process which is embedded within the 'Just Culture' of the organisation's SMS. In the hopefully-rare event that an employee's or student's actions fall without the protections of the just culture (SMS Sect 6), disciplinary action may be deemed appropriate by CAE OAA flight training management, in which the Safety Department will not play a part.

**POLICY**

1. The objectives of the CAE OAA Flight Data Monitoring (FDM)/Flight Operations Quality Assurance (FOQA) system are in compliance with ICAO SARPs and CAP739 (FDM). The aims of the CAE OAA FDM system are to:
  - a. Compare Standard Operating Procedures (SOPs) against those actually achieved every day on the line.
  - b. Be part of the SMS feedback loop to allow corrective action to be taken where safety may be compromised by deviations from SOPs.
  - c. Aid safety data gathering to quantify known risks and assess the effectiveness of their mitigation.
  - d. To use trend analysis to identify unknown risks.
  - e. Aid investigation of incidents and accidents.
2. If the Safety Department at an Academy has the ability to use the Garmin 1000/Vision1000 systems (or equivalent) to collate flight data and cockpit data then the processes used should follow the principles set out in ICAO Annex 6 Part 1 – Flight Data Monitoring and any national regulations pertaining to the inclusion of FDM within an SMS.
3. Unauthorized removal of the G1000/V1000 data cards may be considered a disciplinary offence.
4. Currently, the CAE OAA FDM process is only in use at CAE EASA Academies Oxford and Phoenix using Cessna and Piper aircraft. Any other academy wishing to add this facility should in the first instance engage with the Global Safety Office.
5. At an initial stage, the FDM facility should only be used for trend monitoring, incident and accident investigation (including the investigation of serious or significant incidents or exceedances highlighted by the FDM process).



All FDM data must be sent to a third-party (Flightscope Inc) and the data remain de-identified unless agreed by the individual, in the interests of flight safety learning and continuous improvement.

6. All data will be made available to any national accident investigation agency and kept de-identified unless absolutely necessary and IAW the 'just culture' of the CAE OAA SMS.

7. In the case of possible gross negligence or recklessness, the Academy FSM/O will act as the 'Gatekeeper' and will liaise with the third-party, the CAE OAA Global Safety Manager and CAE Chief Safety Officer before taking further action. As a result and if the incident is considered as meeting the description of either 'grossly negligent' or 'reckless', the FSM/O may release the identity of the individual to the Academy Management for any appropriate disciplinary action.

8. In the event of FDM highlighting any less-serious exceedances or incidents, or ones where the occurrence has not been reported to the FSM/O, the FSM/O will liaise with the FDM Liaison Representatives (if any have volunteered from the cadre of instructors). In the case of a student, the FSM/O will liaise with the CFI/Head of Program.

9. Pilots should first be interviewed for their recollection of events and be offered the opportunity to make a voluntary report, so that lessons can be learnt under the auspices of a just culture. Should pilots decline this offer, they may be open to disciplinary action under the action of para 5.2 of the Just Culture – 'willful failure to report an occurrence'.

10. Submission of a voluntary report does NOT necessarily ensure protection under the Just Culture because if any exceptions of the Just Culture (Para 5.1-5.4) are deemed to have occurred, then disciplinary measures may still be taken.

#### 11. Garmin G1000 Flight Data.

The Garmin G1000 has the capability to record flight data parameters to a removable SD card if the G1000 has the proper system software version. The system software version required to unlock this feature is dependent upon the original manufacturer of the aircraft (Cessna or Diamond, in this case). This feature will automatically record numerous flight and engine parameters and offer the ability to perform post-flight analysis.

The flight data is sampled once per second and saved to the top SD card in the MFD automatically. A flight data file is saved as a separate file for each flight onto the SD card and is created every time the MFD power is cycled to separate the flight data. You can find a list of the potential parameters recorded at the bottom of this document.

#### Diamond Aircraft:

The flight data logging capability in the DA40 G1000 requires system software version 0321.22 or higher in order to be enabled. If necessary, information on upgrading the DA40 G1000 System Software to version 0321.22 or higher may be obtained by your local Garmin Authorized Dealer. The system software upgrade should be available for upgrade at no additional cost.

Presently, flight data logging capability is only available on the Lycoming engine version of the DA42 (DA42L). The required system software version is 1054.03. We do not have any estimated date in which the logging capability may become available for the DA42NG or DA42 TDI.

#### Cessna and Piper Aircraft:

The flight data logging capability in Cessna aircraft requires the G1000 system software version 0563.26 or higher in order to be enabled.

The following policy applies to all centers that operate aircraft with a Garmin G1000 that have this capability: Data Cards are to be procured and fitted. The cards will need to be at least 2-4 Gigabytes. This will ensure they have the capacity to record all data up to the 100hr/30 day interval.



An SD Card Reader is required in order to transfer the flight data files from the SD card to the PC.

A G1000 data card must be installed in the Upper MFD slot at all times.

A process is to be implemented for the cards to be cleared at regular intervals so they maintain their ability to record. The data must be downloaded from the SD card at the soonest of either:

Every 100 hour inspection; or every 30 days.

Downloaded data is to be submitted to the Academy Safety Officer.

The Safety Officer is to send the data to Flightscape to be analyzed against CAE OAA parameters utilizing the web transfer client. Further information and instructions to upload the data file is provided below.

Academy ERPs are to be revised to include the requirement to quarantine the data cards following any incident or accident.

The Safety Officer must provide to the Safety Office, for approval, the data card management methods and process. Elements to include in the process:

Installing data cards

Assignment of a data card to an aircraft

Data download requirements

Submission of data for Flightscape analysis

Various parameters may be recorded, dependent on the individual aircraft specifications, as follows:

- Active Waypoint
- Attitude Pitch Angle
- Attitude Roll Angle
- Autopilot (AP) Engaged
- Baro Adjustment/Correction
- Baro-Corrected Altitude
- Battery AMP
- Battery Volts
- Bearing to Next Waypoint
- COM1 Frequency
- COM2 Frequency
- Current Position
- Cylinder head temperature, cylinders 1-4
- Distance to Next Waypoint
- Engine RPM
- Exhaust Gas Temperature, cylinders 1-4
- Fuel Flow
- Fuel Pressure
- Fuel Quantity Left
- Fuel Quantity Right
- GFC 700 Pitch Command
- GFC 700 Pitch Mode
- GFC 700 Roll Command
- GFC 700 Roll Mode
- GPS Altitude
- GPS Altitude Relative to Mean Sea Level
- GPS Fix
- GPS Horizontal Alert Limit
- GPS Horizontal Protection Level
- GPS Vertical Alert Limit
- GPS Vertical Speed
- Ground Speed
- Ground Track Magnetic
- Horizontal CDI
- HSI Source

- Indicated Air Speed
- Local 24hr Time
- Local Date
- Magnetic Heading
- Magnetic Variation
- Manifold Pressure
- NAV1 Frequency
- NAV2 Frequency
- Oil Pressure
- Oil Temperature
- Outside Air Temperature
- Selected Course
- True Airspeed
- UTC Time
- Vertical CDI
- Vertical Speed
- WAAS GPS Horizontal Protection Level
- WAAS GPS Vertical Protection Level
- Wind Direction
- Wind Speed

Flightscope will prepare a trend analysis for each centre FSO/M and report any exceedances above agreed limits. Unless an MOR is raised or in the case of a serious incident where there is clear evidence of negligence or recklessness, individual events will not be investigated further.

Unless criminal proceedings are involved, the FDM data will not be kept for more than 6 years from date of incident.

12. Appareo Vision 1000 Flight Deck Camera.

The V1000 Flight Deck Camera records the attitude of the aircraft, GPS position audio and video.

A data card must be installed for all flights. In the event of a serious incident/MOR or accident, the G1000 and V1000 SD cards must be removed as soon as possible to prevent the data from being overwritten. Any application of electrical power to the aircraft may destroy valuable safety information.

A V1000 data card must be installed for all flights.

In the event of an accident, MOR, or serious incident, the sensitivity of any such V1000 data must be respected and secured. Therefore, the maintenance engineers must remove and secure the entire V1000 unit, as well as remove the G1000 upper MFD SD card, before any power is re-applied to the aircraft. If deemed necessary by the Global Safety Office, the V1000 unit would then be sent to Appareo for inspection and recovery of the data.

Unless requested by court order for the investigation of a criminal offence, the identifiable video and audio V1000 data may only be released externally to the national accident investigation authorities (e.g. NTSB or AAIB).

**FURTHER ACTIONS REQUIRED BY EACH ACADEMY:**

- If this policy requires a change to operations, Heads of Training / Chief Pilots are to ensure this policy is published as a Local NOTAC detailing the local procedures.
- Quality Managers are to ensure these procedures are incorporated into all applicable Operations Manuals by the Head of Training / Chief Pilot.
- Once incorporated in Ops Manuals, the Safety Office must be informed.



**NOTAC VALIDITY:**

This NOTAC will remain in effect until all Operations Manuals have procedures documented that meet the requirements of this policy.

**EXCEPTIONS AND REVIEW:**

Nil

This policy may be reviewed by the Chief Safety Officer.

**SCOPE:**

All CAE Oxford Aviation Academies

**Effective:** 19 May 2015