



SPEEL PRAHA s.r.o.
Beranových 130, 199 05 Praha 9,
Czech Republic
www.speel.cz | email: info@speel.cz

IMPLEMENTATION SCHEMES OF THE

CVFDR SYSTEM

FIT WITH CUSTOMER NEEDS

Successfully operated on many platforms by customers around the world

All fleet solution:
The core components and ground support equipment are shared across platforms

Powerfull in-house developed software for data analysis and mission debriefing

COCKPIT VOICE & FLIGHT DATA RECORDER

The system tasks

- Collect digital data available on-board of the aircraft
 - Convert analog and discrete signals to digital form
 - Record acquired data to memory.
- Modern aircraft contain many digital electronic boxes – i.e. sensors or system control units. The sensors collect information about the aircraft attitude (Attitude and Heading Reference System), position (GPS or Inertial Navigation Systems), flight parameters in terms of altitude and airspeed (Air Data Computer) etc. Electronic control units control and monitor the function of the aircraft system – e.g. the engine (Engine Control Unit, ECU) or weapon system (Store Management Systems, sequencers). All these systems generate a great amount of valuable data that are available on the on-board data buses. Among them, the most often used buses are ARINC-429, RS-422/232 or MIL-STD-1553B; therefore, the SPEEL's state-of-art CVFDR system is able to receive data via all these data links.



The core components of the CVFDR

The Flight Data Acquisition Unit, FDAU processes analog and discrete electrical signals from the aircraft sensor net. It is also able to receive data in different digital formats – e.g. RS232, RS422, or ARINC429. The Concentrator of Aircraft Data, COAD combines data collected from the FDAU together with digitalized audios into a data stream which transmits via fast Ethernet data link to the recorder – referred to as Crash Airborne Recording Equipment, CARE.

The total capacity of the CARE memory is 500MB which is partitioned as follows:

- 300MB are allocated for audio data that enables recording two audio channels in MP3 format for 10 hours.
- 100MB are allocated for flight and aircraft systems data that enables recording for 50 hours.
- 100MB are used by the file management system in data operations.



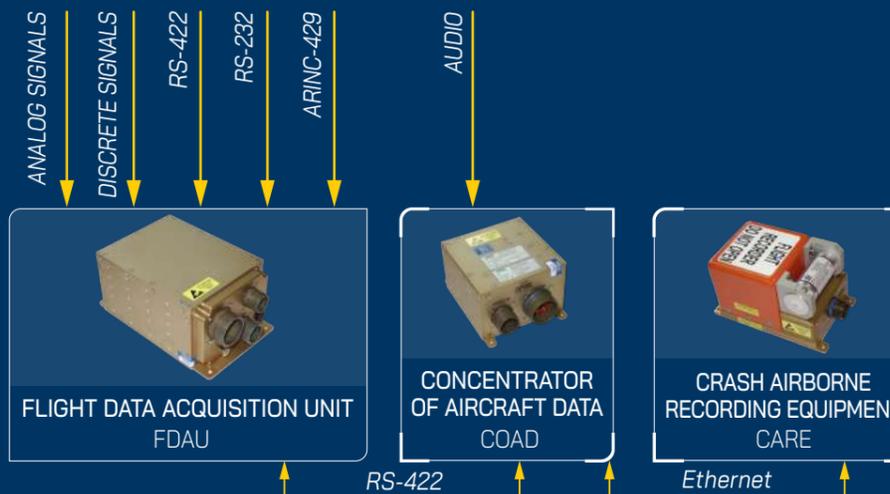
Ground Support Equipment

The Ground Support Equipment, GSE of the CVFDR is intended for the CVFDR maintenance and recorded data processing. The basic part of the GSE is a rugged powerful portable computer – Ground Support Unit, GSU with pre-installed Speel's PANDA software package. If the user plans frequent data downloading from the aircraft and their routine analysis, then the Portable Memory Unit, PMU and the Stationary Data Analysis Workstation, SDAW may prove to be more suitable for such a task.

SPEEL's PANDA software consists of several modules for processing and visualizing flight records. For example the VIEW module allows for graphical visualization of flight data, aircraft silhouette, and flight profile.

The TRACE module has been developed especially with a focus on pilot's needs. It allows for the visualization of several aircraft silhouettes (the silhouettes are designed according to platforms) above a rendered 3D terrain.

SYSTEM ARCHITECTURE AND COMPONENTS



Core of the System

The core of the CVFDR system by SPEEL consists of the components as follows:

- Flight Data Acquisition Unit, FDAU
- Concentrator of Aircraft Data, COAD
- Crash Airborne Recording Equipment, CARE

[Optional Components]

Other optional components of the system are:

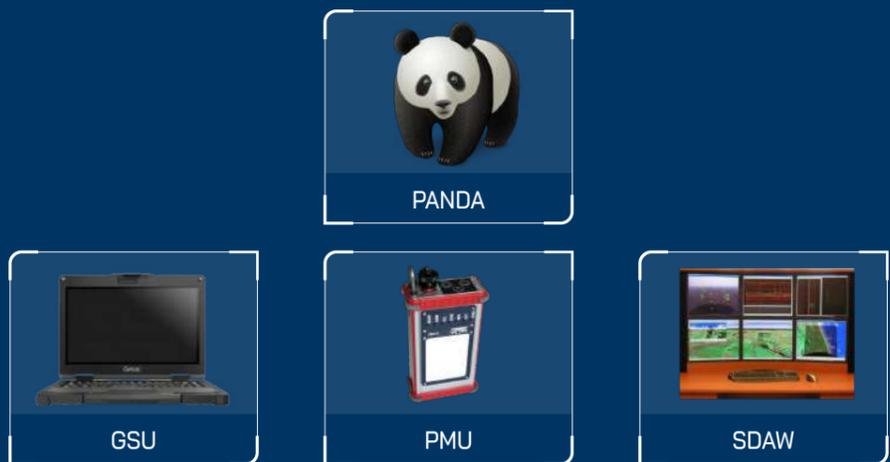
- Air Data Computer, ADC
- Cockpit Area Microphone, CAM
- Discrete Signals to ARINC-429 converter, DTA
- Digital Video Recorder, DVR
- GNSS Receiver, GNSS
- 3-Axis accelerometer, SACC
- Thermocouples Junction Module, ITT
- Signal Lines Protecting Module, SLPM
- Position Sensor for Aircraft, SPOS



Ground Support Equipment

Ground Support Equipment for data analysis:

- Ground Support Unit, GSU
- Portable Memory Unit, PMU
- Stationary Data Analysis Workstation, SDAW



INTEGRATION WITH THE PLATFORM

Examples of CARE integration with the different types of platform

The installation of the CVFDR system requires to integrate its components with the airframe and to create all necessary interfaces with the aircraft signal and power net.

The mechanical integration with the airframe requires:

- to find suitable places, where units can be installed
- to design racks which join the components with the airframe
- to design gear mechanisms which convert the movement of rods to rotation in the angular range which is suitable for the given position sensors.

The mechanical parts can be delivered in form of kits which will contain the racks, the gear mechanism parts and binding elements.

The electrical integration will be done with cable harnesses, which will connect single elements of the CVFDR system but also will interface the CVFDR system with the aircraft wiring.



On C-130 transport aircraft



On F-7 fighter jet



On SA 341 Gazelle helicopter



On Mil Mi-8 transport helicopter



On Mirage 5 fighter jet



On Mil Mi-24 assault helicopter



On L-39NG new trainer jet



On PC-6 utility aircraft

SPEEL PRAHA s.r.o.
Beranových 130,
199 05 Praha 9,
Czech Republic

www.speel.cz
info@speel.cz
sales@speel.cz
+420 286 923 619

Information contained herein is the property of SPEEL and is subject to change without notice. ©2024 SPEEL PRAHA s.r.o.