

**1. GENERAL.**

The Flight Recorder system consists of:

- The Flight Data Acquisition Unit (FDAU) that collects and arranges the data.
- The Solid State Flight Data Recorder (SSFDR) that records the data in a solid state memory.
- The EICAS Control Panel, ECP and Menu page for insertion of flight data.
- The triaxial accelerometer.
- Surface position sensors.

The Flight Recorder system becomes powered and starts to operate as soon as one condition lever is set to START.

**2. MAIN COMPONENTS AND SUBSYSTEMS.****2. 1. Flight Data Acquisition Unit (FDAU).**

The FDAU, which is part of the Data Concentrator Unit is installed in the avionics rack, samples data from various sensors and systems according to a prearranged program which includes different sampling rates for various parameters. Parameters prone to high rate of change consequently have the highest sampling rate while, for example, switch positions are sampled at a low rate. Analog parameters are converted into digital numbers and all parameters are formatted into a data stream in which each data word has its fixed location. The word can thus be easily found in the recorder memory and recovered for analysis on ground, for example transcribed into more conveniently readable form, altitude in feet etc.

**2. 2. Solid State Flight Data Recorder (SSFDR).**

This is a recorder with a crashproof memory unit installed in the rear compartment. The recorder is of the continuous type which means that all data is recorded in a continuous stream. However, the recorder can not hold more data than that corresponding to approximately 25 flight hours. When the memory is filled up, the oldest data is therefore automatically erased and new data entered instead. The memory may therefore be looked upon as an endless band,

holding information from the latest 25 flight hours. To prevent unintentional blanking of recorded data during ground stops or maintenance, a relay controlled by either engine condition lever switches off the Flight Recorder when engines are not running. The recorder unit is provided with an underwater locator beacon, automatically started when submerged in water. It is battery powered and transmits an acoustic signal for 30 days. The recorder has a feature that allows the memory to be dumped for analysis of flight data.

**2. 3. EICAS and flight data entry.**

The EICAS Control Panel, ECP is used for flight data entry on the EICAS Menu page. The ECP is also provided with an FDR button for aircraft operation events.

**2. 4. Triaxial accelerometer.**

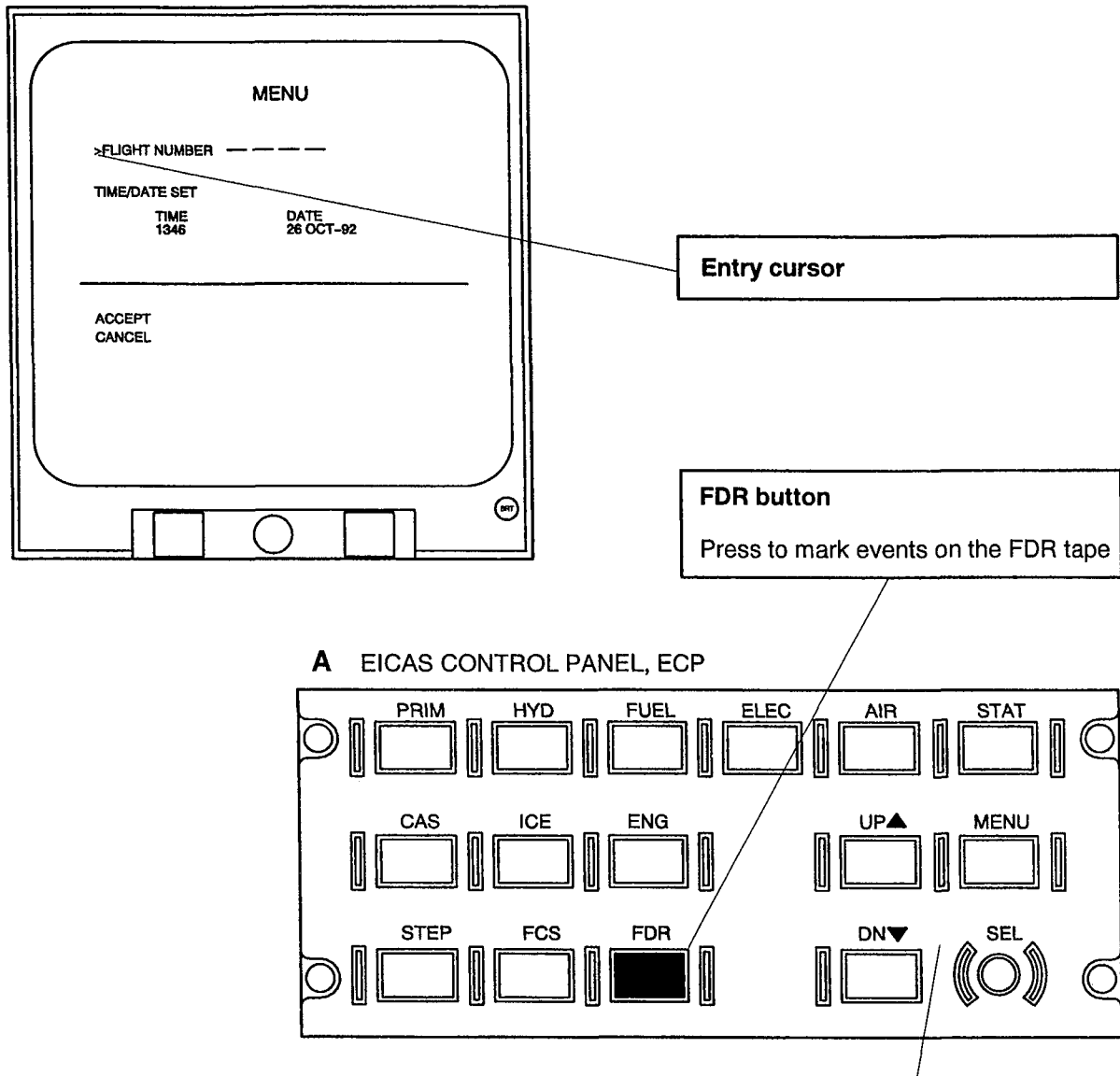
The accelerometer provides the system with data for vertical, longitudinal and lateral axis.

**2. 5. Quick Access Recorder (QAR).**

The QAR is optional equipment. The system consists of a Quick Access Recorder with a 1/4 inch magnetic tape cartridge as the recording media. The QAR is supplied with 115 VAC 400 Hz power via a separate circuit breaker in the cockpit designated "Quick Access RCDR". Power to the circuit breaker is provided by the Flight Data Recorder power supply logic. Data is transmitted from the Right DCU to the QAR via a momentary pushbutton "QAR DATA STOP", with the function to stop data when pushed. The data is identical to the data recorded by the Flight Data Recorder, which is received from the Left DCU. The QAT and stop pushbutton are located in a wardrobe in the cabin. The magnetic tape cartridge can be ejected only when power is supplied to the unit and no data is transmitted. When data is not transmitted, the BUSY indicator on the QAR front panel will flash.

The cartridge recording capacity will be about 22–25 hours in normal operation, depending on how frequent data must be rewritten. There are also three indicators on the front panel which show the status:

- POWER ON – Illuminates as soon as power is supplied to the QAR.
- READY – Illuminates when the cartridge is inserted correctly and the system is ready for use.
- BUSY – Illuminates when the cartridge is inserted and data is transmitted to the unit.  
Flashes when the cartridge is inserted and no data is transmitted to the unit.

**3. CONTROLS AND INDICATORS.**

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**FLIGHT DATA ENTRY**

The UP and DN buttons move the cursor and the SEL button enables the entry position.  
Ex. setting TIME/DATE:

- Positioning the cursor at the TIME/DATE SET entry line and pressing the SEL button enables the setting.
- Then, change the values by UP/DN and press SEL to enter and to move on to next value.
- When the last value has been set, the cursor automatically moves to ACCEPT line. Press SEL to accept the changed flight data.
- To cancel the set flight data, select CANCEL line and press SEL to cancel.

FIG.1. Flight Data entry controls.

### 4. ELECTRICAL POWER SUPPLY.

Flight recorder .....	L INV BUS	F-22	RECORD FLIGHT
Accelerometer .....	L AVIONIC BUS	F-21	RECORD FDR ACCEL
Quick Access Recorder .....	L INV BUS	N13	QUICK ACCESS RCRD (Optional)

**1. GENERAL.**

The Cockpit Voice Recorder (CVR) records the last 30 minutes of cockpit communications and sounds using a four channel endless magnetic tape. The recorder has a crashproof housing and is installed in the rear compartment accessible through the aft cargo compartment wall.

The CVR operates continuously as soon as EMERGENCY AVIONICS BUS is powered.

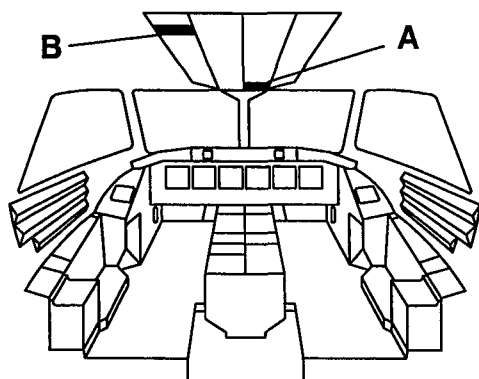
The CVR records audio communication directly from the Digital Remote Electronic Unit, DREU on four audio channels. Two separate channels for pilot, copilot and one channel for PA/Cabin Interphone. The fourth channel, records sounds picked up with the cockpit area microphone in the overhead panel.

The whole tape can be erased in a few seconds provided aircraft on ground and gust lock set.

The recorder is provided with an underwater locator beacon which is automatically started when submerged in water. The locator is battery powered and will send out acoustic signals for 30 days.

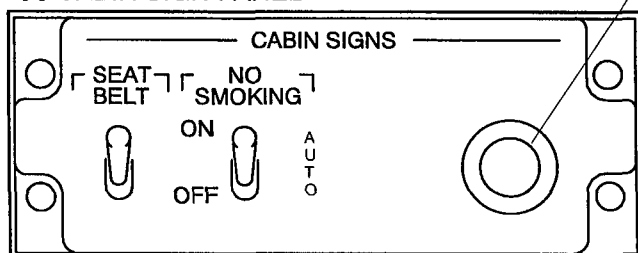
An Inertia switch will switch off the CVR saving the records if the aircraft longitudinal G-load exceeds approximately 2 G.

### 2. CONTROLS AND INDICATORS.

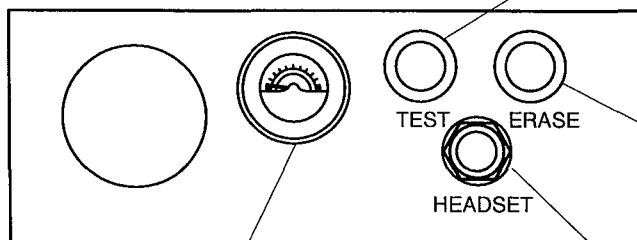


Cockpit area microphone

#### A CABIN SIGN PANEL



#### B CVR CONTROL PANEL



#### TEST button

When pressed, an internal test starts producing:

- A 600 Hz audio tone to headset output
- A green band indication on the monitor meter

#### ERASE button

When pressed at least 2 seconds with aircraft on ground and with gust lock set the recordings on the tape will be erased

Monitor meter

#### Headset output

Used to monitor present recordings

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FIG.1. Cockpit voice recorder – controls and indicators.

Applicable to A/C with magnetic tape  
(30 min) CVR

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### 3. ELECTRICAL POWER SUPPLY.

Voice recorder .....EMERGENCY AVIONICS BUS F-23 RECORD VOICE

Applicable to A/C with magnetic tape  
(30 min) CVR

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**1. GENERAL.**

The Solid State Cockpit Voice Recorder (SSCVR) records the last 30 minutes or 2 hours (depending on selected options) of cockpit communications and sounds using digital solid state memory circuits. The recorder has a crashproof memory capsule and is installed in the rear compartment accessible through the aft cargo compartment wall.

The SSCVR operates continuously as soon as EMERGENCY AVIONICS BUS is powered.

The SSCVR records four audio communication channels directly from the Digital Remote Electronic Unit, DREU. Two separate channels for the pilot and the copilot. One channel for PA/Cabin Interphone. The fourth channel, records sounds picked up with the cockpit area microphone in the overhead panel.

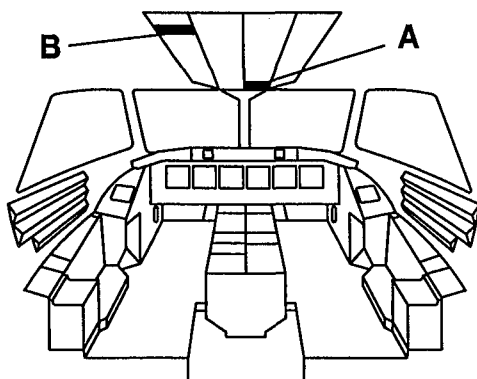
The solid state memory can be errased provided aircraft is on ground and gust lock is set.

The recorder is provided with an underwater locator beacon which is automatically started when submerged in water. The locator is battery powered and will send out acoustic signals for 30 days.

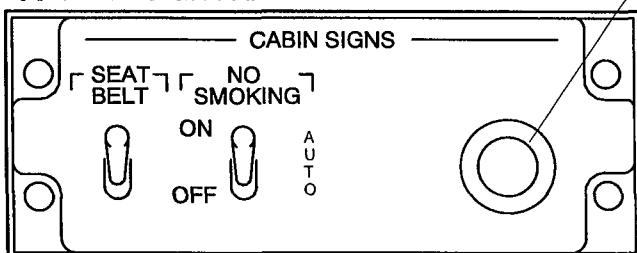
An Inertia switch will switch off the SSCVR saving the records if the aircraft longitudinal G-load exceeds approximately 2 G.



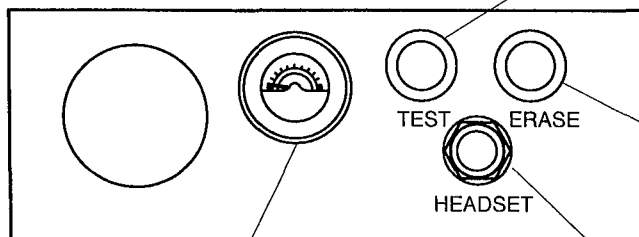
### 2. CONTROLS AND INDICATORS.



#### A CABIN SIGN PANEL



#### B CVR CONTROL PANEL



Monitor meter

Cockpit area microphone

#### TEST button

When pressed, an internal test starts producing:

- A 600 Hz audio tone to headset output
- A green band indication on the monitor meter

#### ERASE button

When pressed at least 2 seconds with aircraft on ground and with gust lock set the recordings will be erased

#### Headset output

Used to monitor present recordings

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FIG.1. Cockpit voice recorder – controls and indicators.

Applicable to A/C with Solid State CVR.  
Options 512-1 & 601-2

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**1. GENERAL.**

The Solid State Cockpit Voice Recorder (SSCVR) records the last 30 minutes or 2 hours (depending on selected options) of cockpit communications and sounds using digital solid state memory circuits. The recorder has a crashproof memory capsule and is installed in the rear compartment accessible through the aft cargo compartment wall.

The SSCVR operates continuously as soon as EMERGENCY AVIONICS BUS is powered.

The SSCVR records four audio communication channels directly from the Digital Remote Electronic Unit, DREU. Two separate channels for the pilot and the copilot. One channel for PA/Cabin Interphone. The fourth channel, records sounds picked up with the cockpit area microphone in the overhead panel.

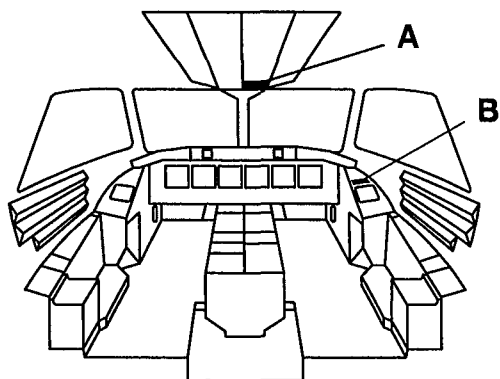
The solid state memory can be errased provided aircraft is on ground and gust lock is set.

The recorder is provided with an underwater locator beacon which is automatically started when submerged in water. The locator is battery powered and will send out acoustic signals for 30 days.

An Inertia switch will switch off the SSCVR saving the records if the aircraft longitudinal G-load exceeds approximately 2 G.

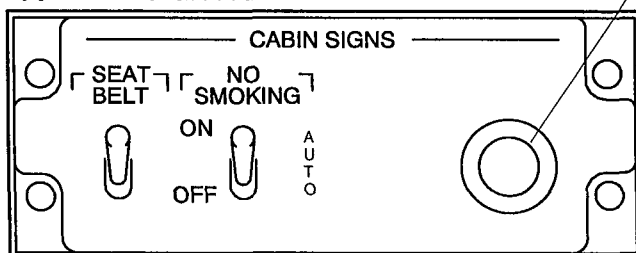
Applicable to A/C with Solid State CVR

#### 2. CONTROLS AND INDICATORS.

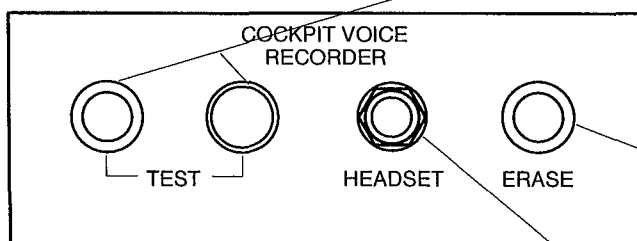


**Cockpit area microphone**

#### A CABIN SIGN PANEL



#### B CVR CONTROL PANEL



#### TEST button

When TEST button pressed, an internal test starts producing:

- The green TEST light comes on (extinguishes when TEST button is released)
- A 600 Hz audio tone to headset output

#### ERASE button

When pressed at least 2 seconds with aircraft on ground and with gust lock set the recordings will be erased

#### Headset output

Used to monitor present recordings

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FIG.1. Cockpit voice recorder – controls and indicators.

Applicable to A/C with Solid State  
CVR. Option 601–3

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**1. GENERAL.**

The Solid State Cockpit Voice Recorder (SSCVR) records the last 30 minutes or 2 hours (depending on selected options) of cockpit communications and sounds using digital solid state memory circuits. The recorder has a crashproof memory capsule and is installed in the rear compartment accessible through the aft cargo compartment wall.

The SSCVR operates continuously as soon as EMERGENCY AVIONICS BUS is powered.

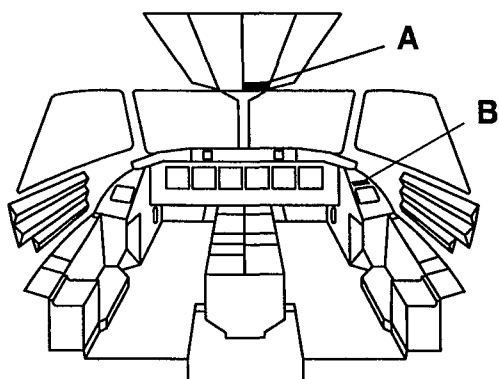
The SSCVR records four audio communication channels directly from the Digital Remote Electronic Unit, DREU. Two separate channels for the pilot and the copilot. One channel for PA/Cabin Interphone. The fourth channel, records sounds picked up with the cockpit area microphone in the overhead panel.

The solid state memory can be erased provided aircraft is on ground and gust lock is set.

The recorder is provided with an underwater locator beacon which is automatically started when submerged in water. The locator is battery powered and will send out acoustic signals for 30 days.

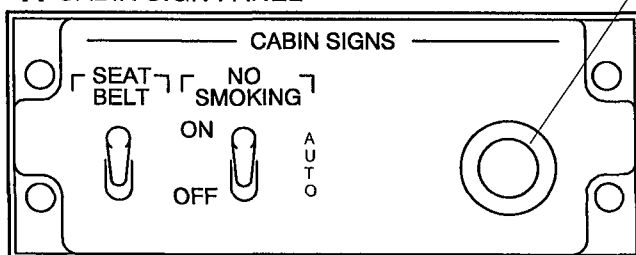
An Inertia switch will switch off the SSCVR saving the records if the aircraft longitudinal G-load exceeds approximately 2 G.

### 2. CONTROLS AND INDICATORS.

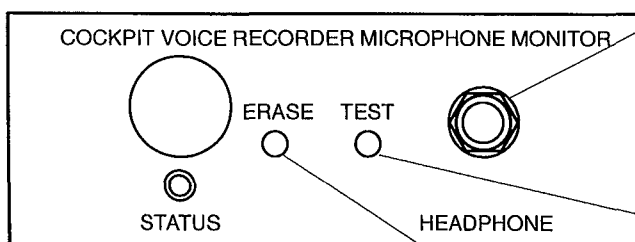


Cockpit area microphone

#### A CABIN SIGN PANEL



#### CVR CONTROL PANEL



#### Headset output

Used to monitor present recordings

#### TEST button

When TEST button pressed, an internal test starts producing:

- The green status light flashes ones
- A 800 Hz audio tone to headset output

#### ERASE button

When pressed at least 1/2 second with aircraft on ground and with gust lock set the recordings will be erased

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FIG.1. Cockpit voice recorder – controls and indicators.

Applicable to A/C with Solid State  
CVR. Option 601-4

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### 3. ELECTRICAL POWER SUPPLY.

Voice recorder .....EMERGENCY AVIONICS BUS F-23 RECORD VOICE

Applicable to A/C with Solid State  
CVR.

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