



1. GENERAL.

The air data system uses three Pitot/Static tubes which sense the pitot and the static pressures and feeds that information to the pneumatic instruments and to the Air Data Computer (ADC). The ADC calculates the various data to be displayed on the electric instruments and EFIS or to be supplied to other systems as shown in Fig. 2.

2. MAIN COMPONENTS AND SUBSYSTEMS.

2.1. Pitot/static systems.

The aircraft is equipped with two main and one standby pitot/static system (Fig. 1). The two main Pitot/Static tubes have two separate static chambers. Each static chamber is interconnected with the corresponding chamber in the other tube. The purpose is to eliminate pressure differences between the two systems. The interconnections are provided with shutoff valves to isolate the systems for example should a static leak appear. The left main tube supplies the ADC and the right main tube supplies the pneumatic instruments.

The standby Pitot/Static tube has only one static chamber and supplies the standby instruments and the airspeed sensor.

All three Pitot/Static tubes are electrically heated to prevent icing. A failure of the heating will light a caution: L, R or STBY PITOT caution light on the overhead panel. Also see 11.1 ICE AND RAIN PROTECTION. The tubes are located as follows:

- Left main tube and standby (upper tube) on the left side of the a/c fwd fuselage.
- Right main tube on the right side of the a/c fwd fuselage.

2.2. Temperature probe.

The Outside Air Temperature probe (OAT), senses air temperature for the ADC. The probe is provided with an electrical heater for anti-icing. Also see AOM 11.1 ICE AND RAIN PROTECTION. Should the heater fail, the OAT caution light on the overhead panel will come on. The OAT probe is located on the upper part of the fwd fuselage.

2.3. Air Data Computer (ADC).

The ADC senses the air temperature, it also converts the pitot and static pressures into electrical signals from which the ADC calculates the various parameters. These parameters are:

- Altitude (ALT).
- Vertical speed (VS).
- Indicated airspeed (IAS).
- True airspeed (TAS).
- Maximum operating speed (V_{MO}).
- Static air temperature (SAT).

These parameters are available as digital values and analogue signals and are supplied to many systems as shown in Fig. 2.

The ADC calculates the V_{MO} and triggers the master warning system to give an overspeed warning when the speed exceeds V_{MO} by 2 kt.

2.5. Instruments.

These are two different types of indicators:

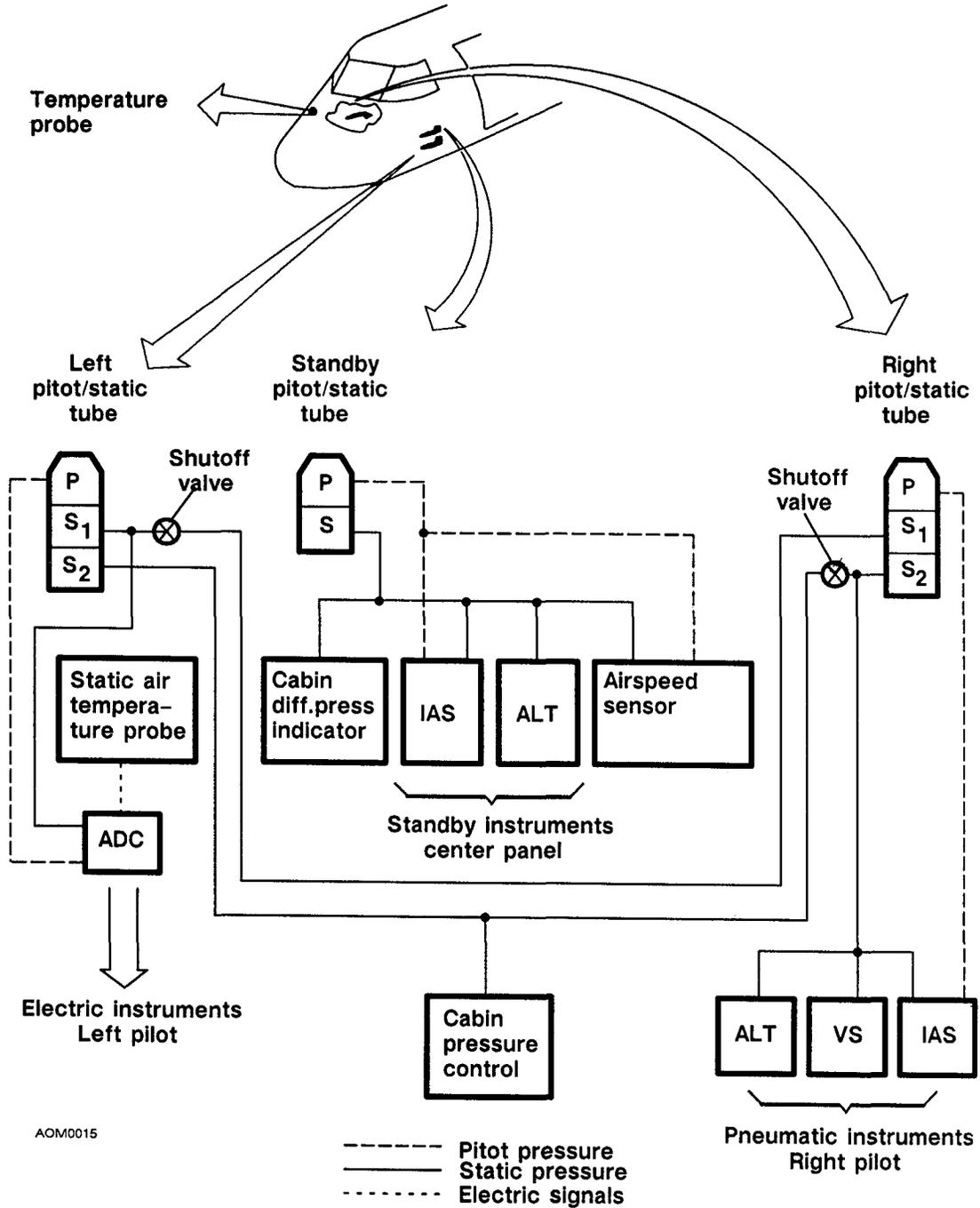
- Electromechanical (servo) indicators for the left pilot, supplied with data from ADC.
- Pneumatic indicators for the right pilot and for standby instruments, supplied directly with pitot and/or static pressures.

Altimeters.

The ADC supplies information of uncorrected altitude to the electromechanical altimeter. The altimeter converts this information into a display, corrected for the barometer pressure, set by a baroknob on the instrument. The display shows both a five numerical digital readout and an analogue pointer with a smallest scale increment of 20 ft. The corrected altitude is also supplied to the altitude preselector/alerter. The altimeter also contains an encoder that furnishes the ATC transponders with aircraft altitude information related to 1013 mb/2991 inHg.

The pneumatic altimeters are equipped with an aneroid which converts static pressure into a mechanical movement of the counter and pointer. Correction for barometer pressure is set with a baro knob on each instrument. The display is the same as for the electromechanical altimeter.

(Cont'd page 5)



AOM0015

Fig. 1. Pitot/static systems - schematic.



INSTRUMENTS AND RECORDERS, AIR DATA SYSTEM
Description

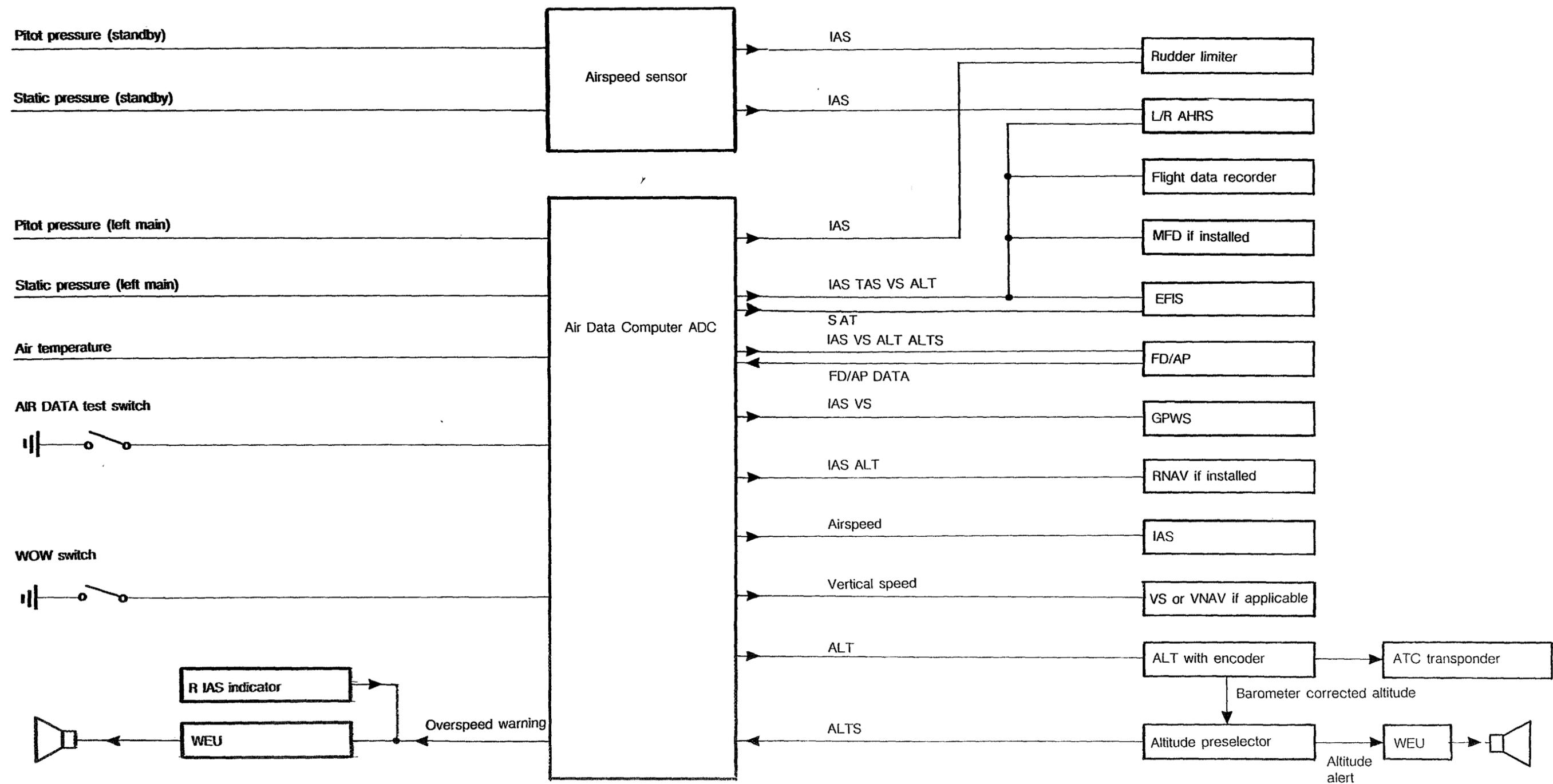


Fig. 2. ADC inputs/outputs.



Airspeed indicators.

The electromechanical airspeed indicator is supplied with information from the ADC regarding indicated airspeed (IAS) and Maximum operating speed (V_{MO}). The speed information is converted and displayed by two pointers which indicates IAS and V_{MO} against a non-linear scale for maximum accuracy.

Both airspeed indicators are provided with airspeed reference bugs that can be set as reminders. As an option a servodriven bug can be included in the L IAS indicator. The bug is used to select speed for the FD/AP when flying in IAS mode. Also see 3.1 AUTOFLIGHT. The set value also goes to a circuitry in the indicator determining the difference between selected and actual speed. This difference is displayed as a Fast- Slow deviation indication on the EADI.

The pneumatic airspeed indicators are connected directly to the pitot and static pressures. The right airspeed indicator has two pointers indicating IAS and V_{MO} . The indicator is also provided with airspeed reference bugs that can be set as reminders. The indicator also gives overspeed warning as a backup for the ADC overspeed warning. The standby airspeed indicator gives only IAS indication.

Vertical speed indicator.

The electromechanical vertical speed indicator displays vertical speed which has been determined and supplied by the ADC. The pneumatic indicator converts change in static pressure into a proportional vertical speed.

Vertical navigation indicator. (Optional.)

This instrument has two functions:

- To serve as an indicator displaying vertical speed as determined by the ADC.
- To compute data for vertical navigation. These data are either used to feed the FD/AP for automatic capture of the vertical path or to be displayed to aid in a manual capture of the aiming point.

Vertical navigation is described in AOM 3.1 AUTOFLIGHT.

SAT/TAS indication.

Static Air Temperature and True Air Speed are determined by the ADC and displayed on the EHSI's.

Altitude Preselector Alerter.

The Altitude Preselector Alerter (APA) system alerts the flight crew when the aircraft is approaching, or deviating from, a selected altitude. The alert announcement is both aural and visual.

The APA is supplied with barometer corrected altitude from the servo altimeter. The barometer corrections made by the altimeter baroset knob thus also affects the APA. The altitude for which an alert announcement is desired is set with the ALT SET knob on the altitude preselector on the glareshield panel. The aural warning is produced by the WEU. The system is interconnected with the FD/AP to provide selected altitude for the ALTS mode.

Also see AOM 3, AUTOFLIGHT.

Airspeed Sensor.

The airspeed sensor is supplied from the standby pitot/static tube. The sensor converts the pressures into electrical IAS signals which it provides to the AHRS and Rudder Limiter systems. The Rudder Limiter system uses this IAS as an accuracy check of the Airdata computer provided IAS signal.

SAAB 340 B

Aircraft Operations Manual

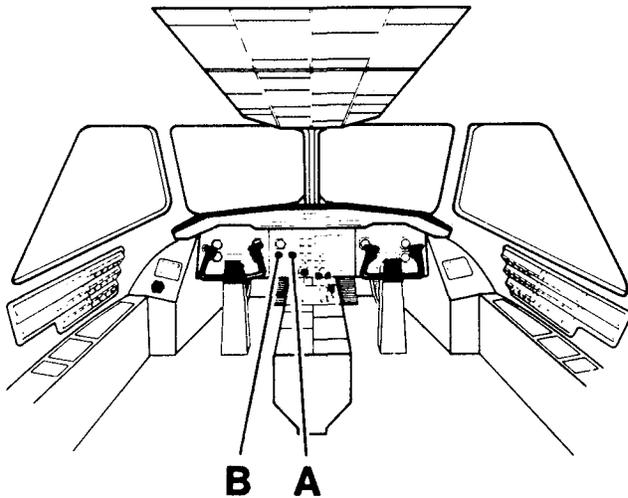


INSTRUMENTS AND RECORDERS, AIR DATA SYSTEM
Description

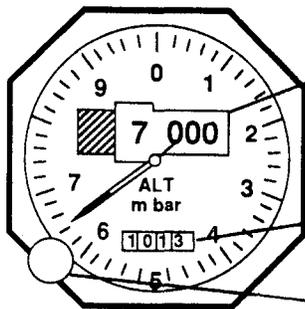
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3. CONTROLS AND INDICATORS.



A STANDBY ALTIMETER



Altitude indication.

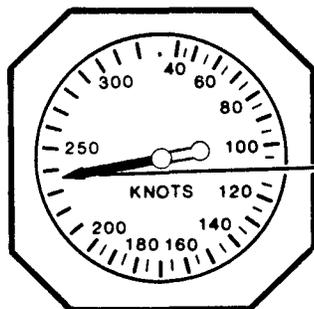
Shows aircraft altitude with a smallest scale increment of 20 ft by a digital and an analogue scale.

Baroset indication.

Displays set barometric pressure in millibars (MB), or as an option in inches of mercury (IN HG).

Baroset knob.

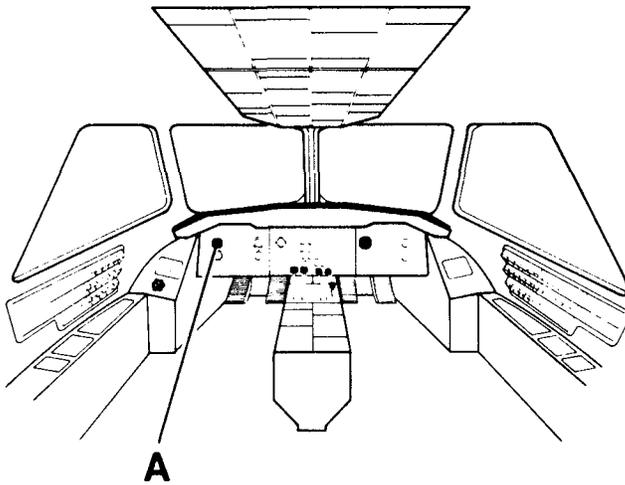
B STANDBY IAS INDICATOR



IAS pointer.

No V_{MO} indication is provided.

Fig. 3. Standby Altimeter and Standby Indicated Airspeed indicator.



A LEFT IAS INDICATOR

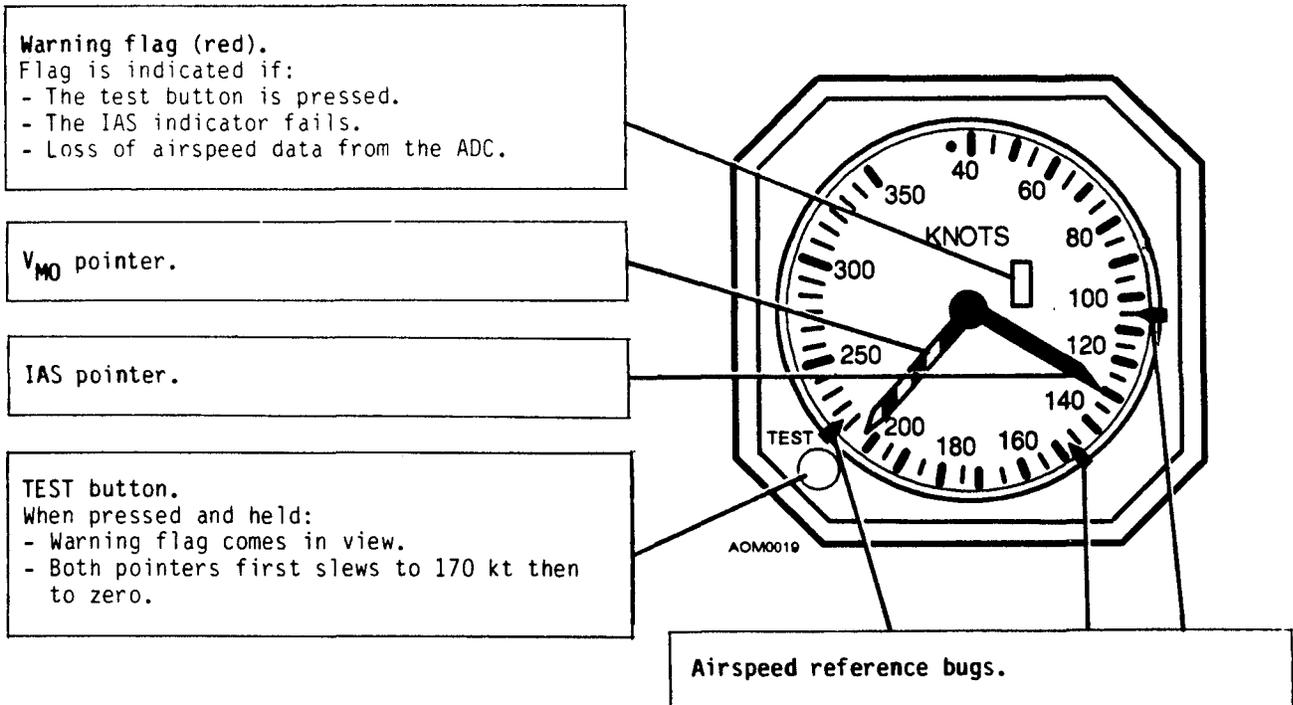
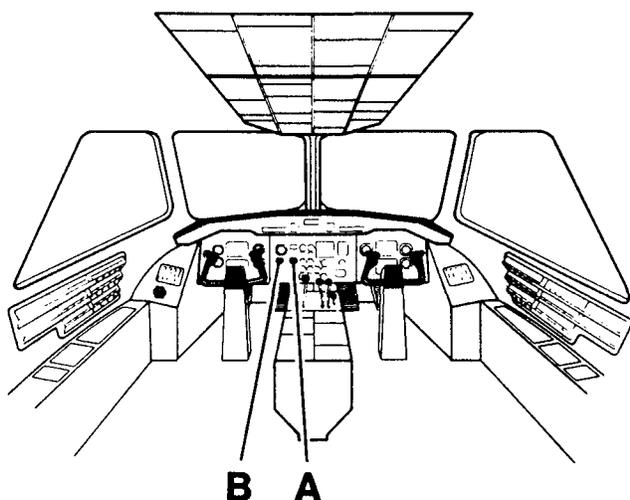


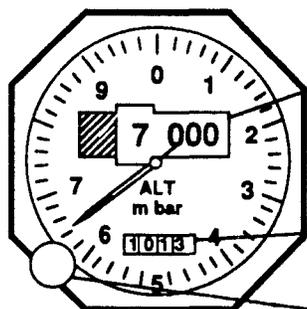
Fig. 4. Left Indicated Airspeed (IAS) indicator - control and indication.



3. CONTROLS AND INDICATORS.



A STANDBY ALTIMETER

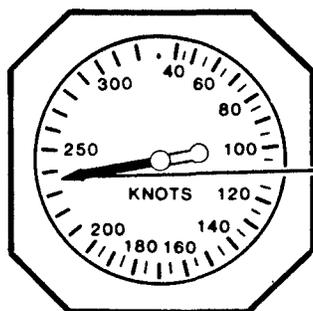


Altitude indication.
Shows aircraft altitude with a smallest scale increment of 20 ft by a digital and an analogue scale.

Baro set indication.
Displays set barometric pressure in millibars (MB), or as an option in inches of mercury (IN HG).

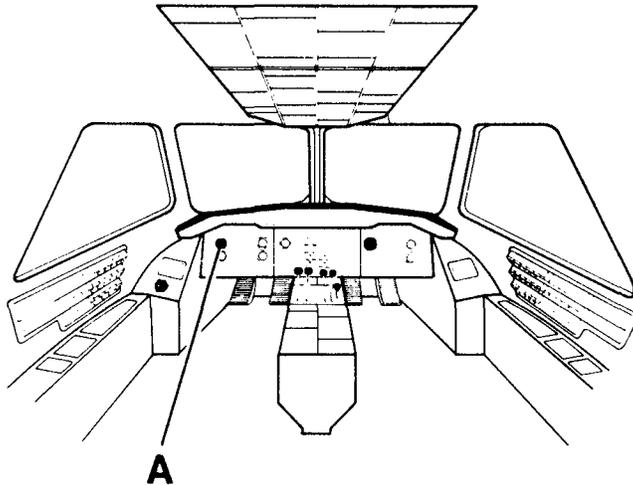
Baro set knob.

B STANDBY IAS INDICATOR



IAS pointer.
No V_{MO} indication is provided.

Fig. 3. Standby Altimeter and Standby Indicated Airspeed indicator.



A LEFT IAS INDICATOR

Warning flag (red).
Flag is indicated if:

- The test button is pressed.
- The IAS indicator fails.
- Loss of airspeed data from the ADC.

V_{MO} pointer.

IAS pointer.

IAS bug knob.
When IAS mode (FD/AP) is selected the IAS bug will capture the actual IAS. Turn the IAS bug knob to change IAS and the FD/AP will follow. Also see page 14 Fast-Slow speed indication and 3.1 AUTOFLIGHT.

When pressed and held for test:

- Warning flag comes in view.
- Both pointers first slews to 170 kt then to zero.

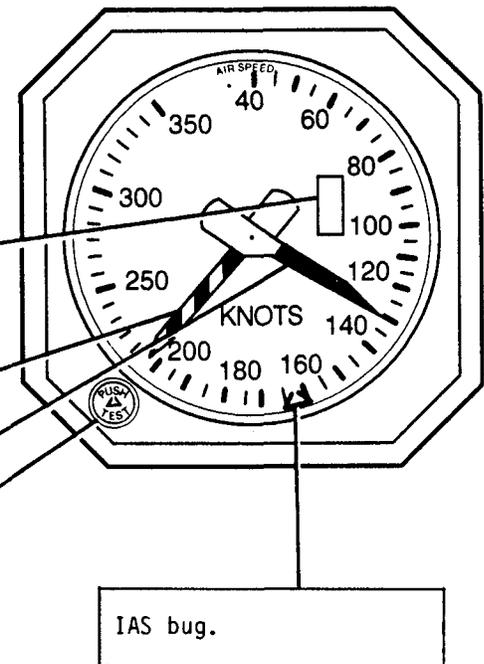
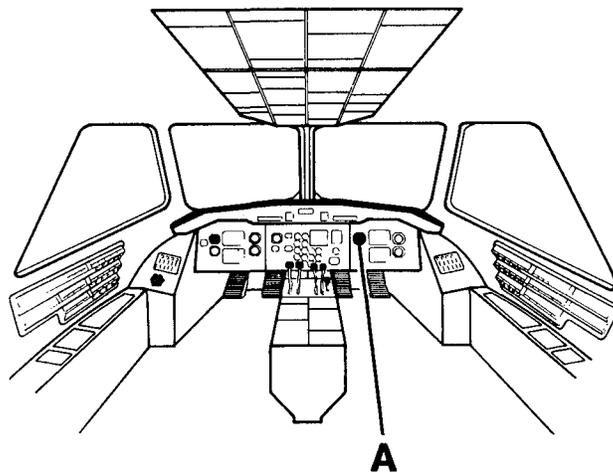


Fig. 4. Left Indicated Airspeed (IAS) indicator - control and indication.



A RIGHT IAS INDICATOR

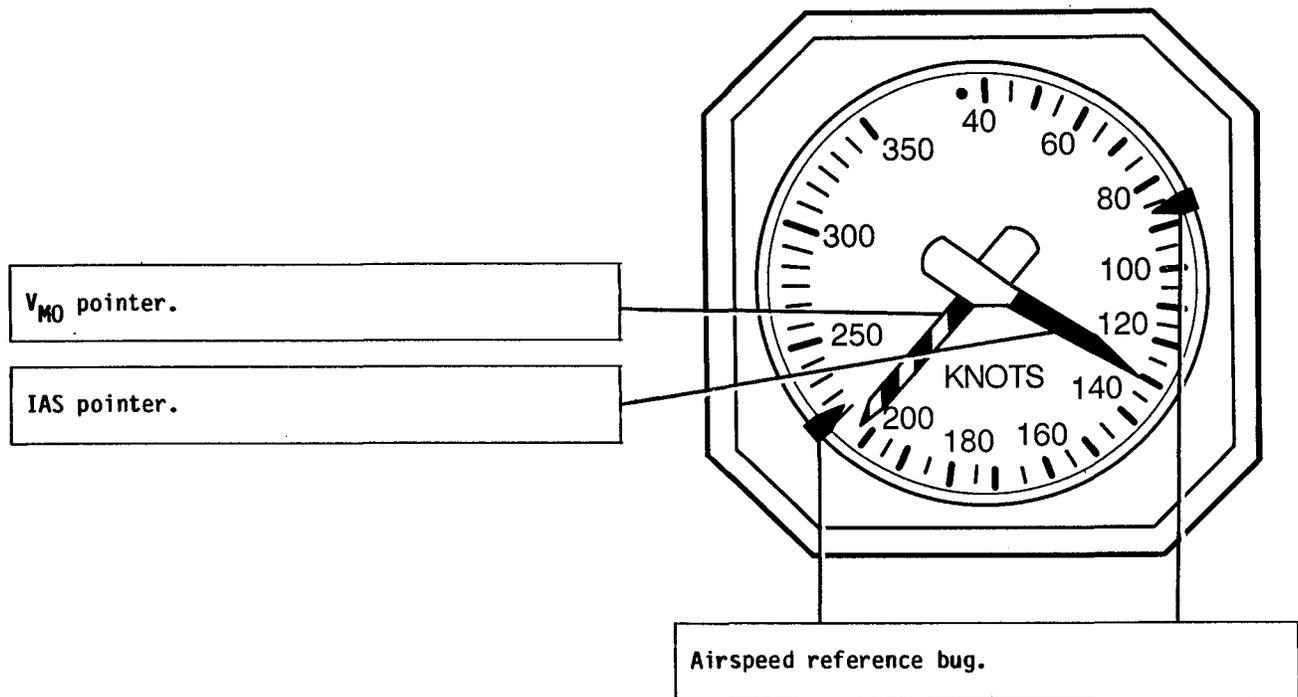
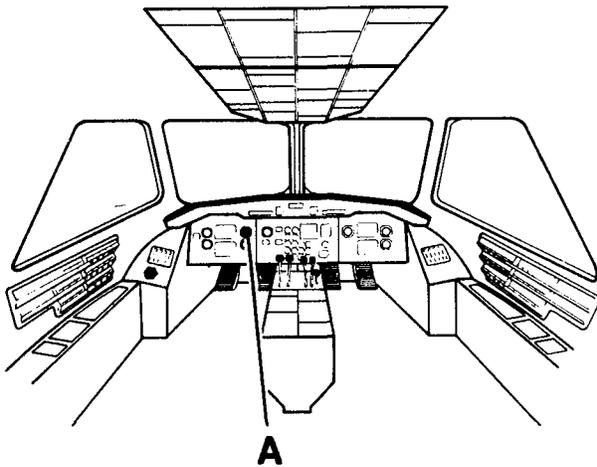


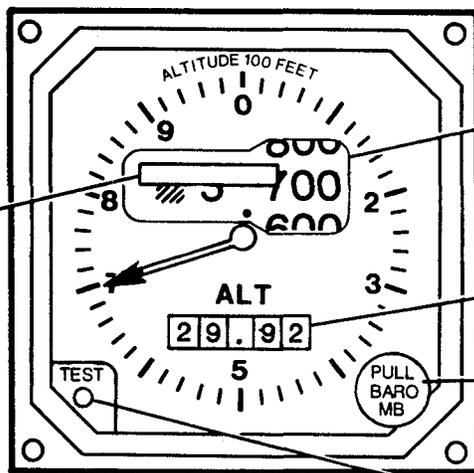
Fig. 4. Right Indicated Airspeed (IAS) indicator.



INSTRUMENTS AND RECORDERS, AIR DATA SYSTEM Description



A LEFT ALTIMETER



Altitude indication.
Shows aircraft altitude by a digital and an analogue scale with a smallest scale increment of 20 ft.

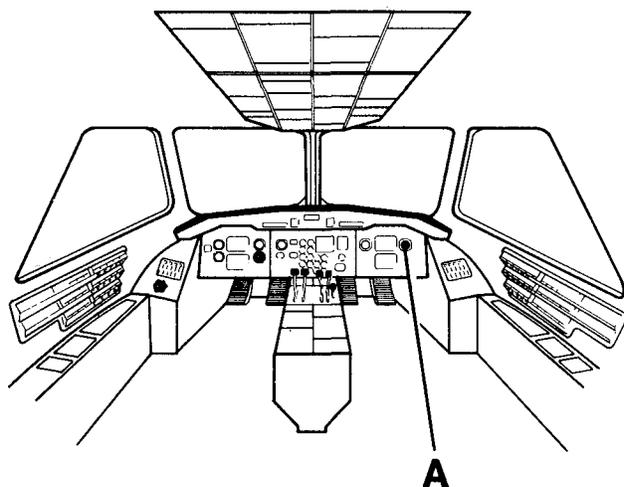
Baro set indication.
Displays set barometric pressure in inches mercury (IN HG) or millibars (MB).

Baro set knob.
Pushed for IN HG, pulled for MB.

TEST button.
When pressed and held:
- Warning flag comes in view.
- Pointer goes either way to the 9 o'clock position.
- Transponder altitude report is inhibited.

Warning flag (red).
Flag is indicated if:
- The test button is pressed.
- The altimeter fails.
- Loss of altitude data from the ADC.

Fig. 5. Left Altimeter (ALT) indicator.



A RIGHT ALTIMETER

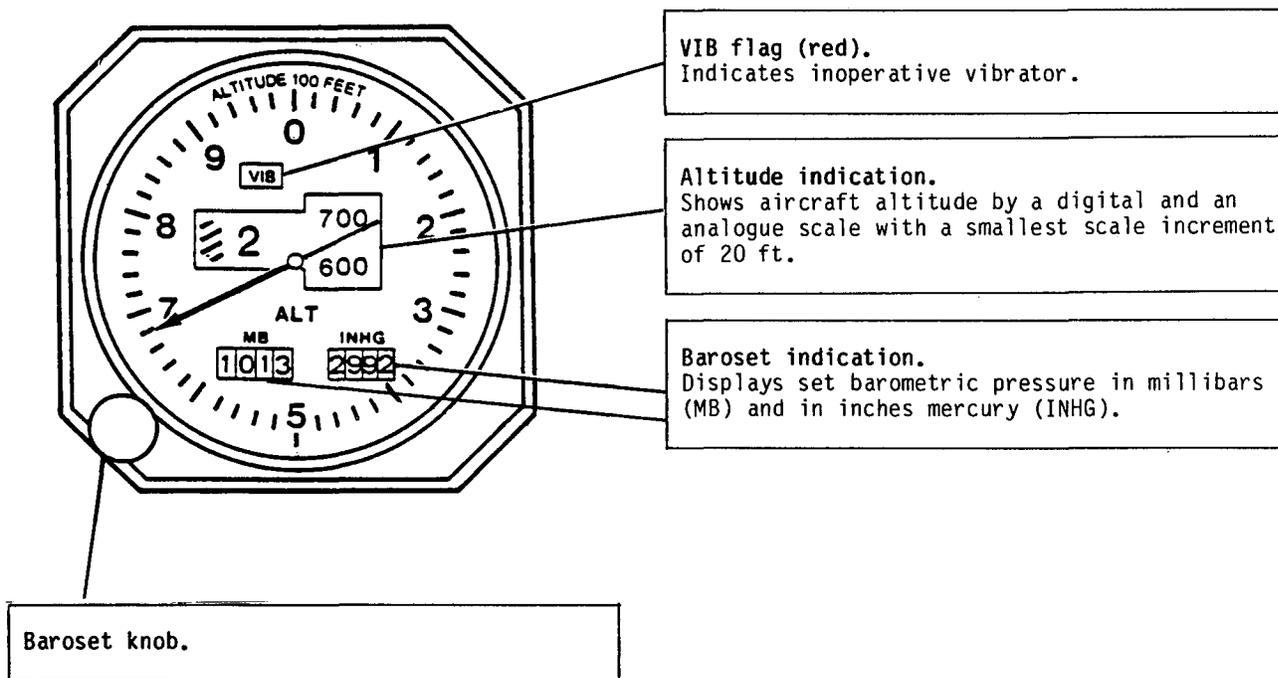
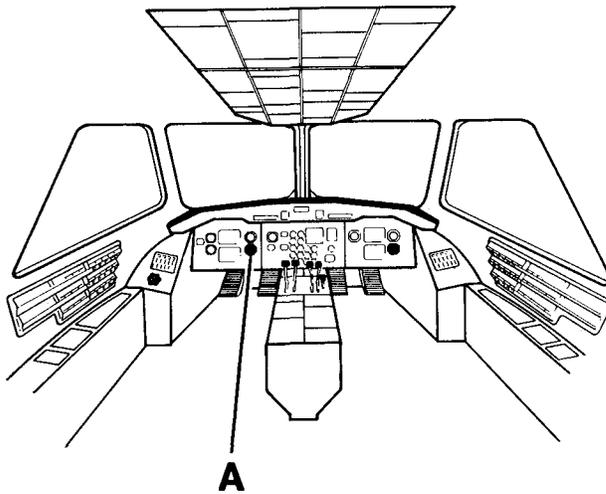
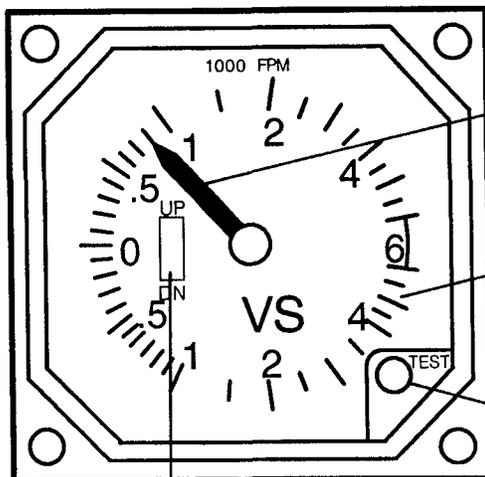


Fig. 6. Right Altimeter (ALT) indicator.



A LEFT VERTICAL SPEED INDICATOR



AOM0017

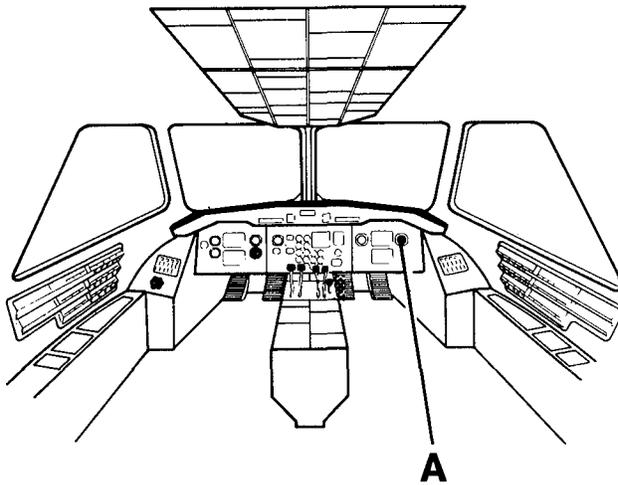
Vertical speed pointer.

Vertical speed scale.
Scaled in fpm x 1000.

PUSH TEST button.
When pressed and held:
- Warning flag comes in view.
- Pointer moves to 6000 fpm up position.

Warning flag (red).
Flag is indicated if:
- The test button is pressed.
- The vertical speed indicator fails.
- Loss of vertical speed data from the ADC.

Fig. 8. Left Vertical Speed, VS, indicator.



A RIGHT ALTIMETER

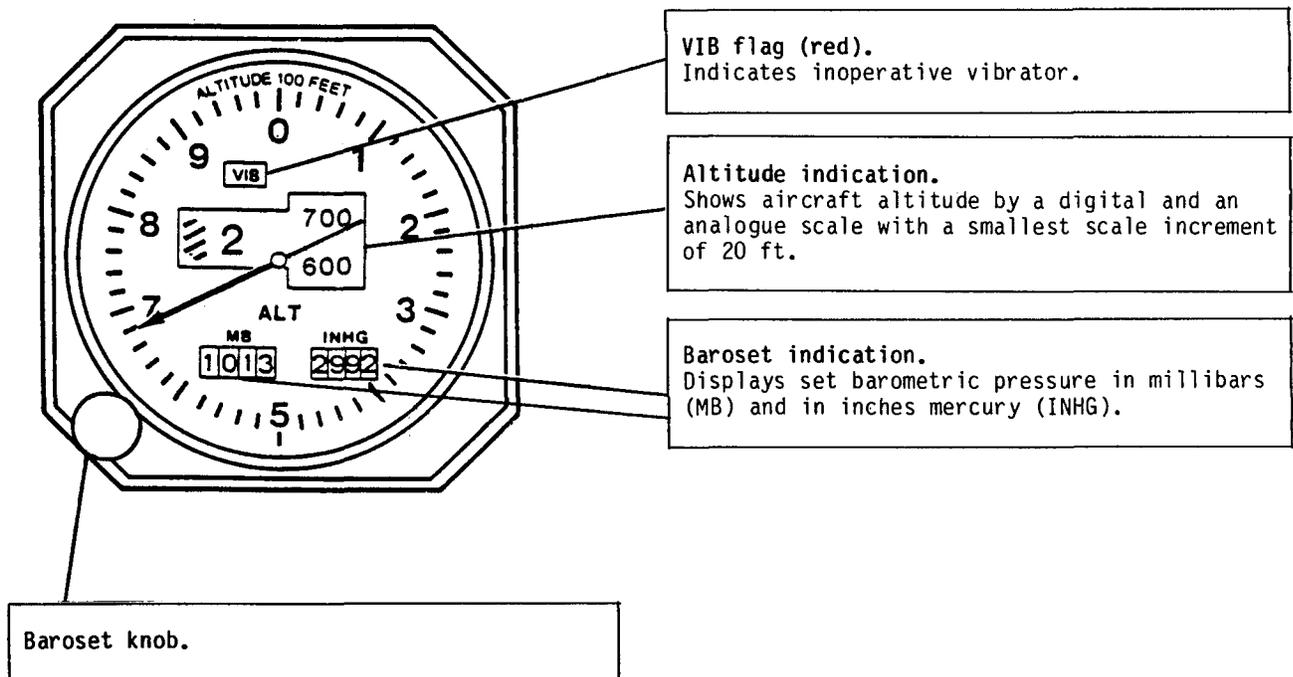
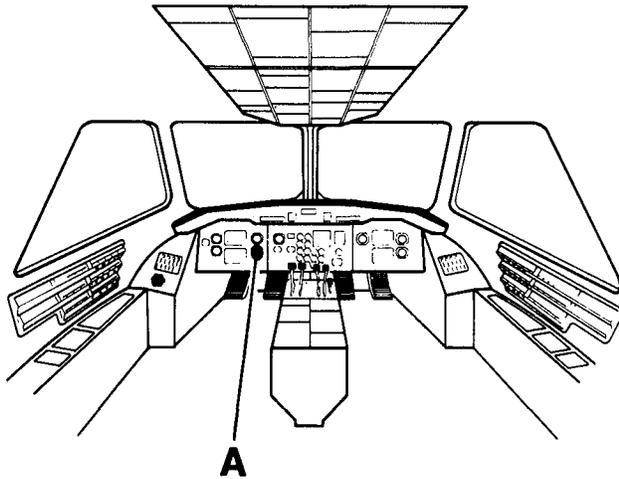
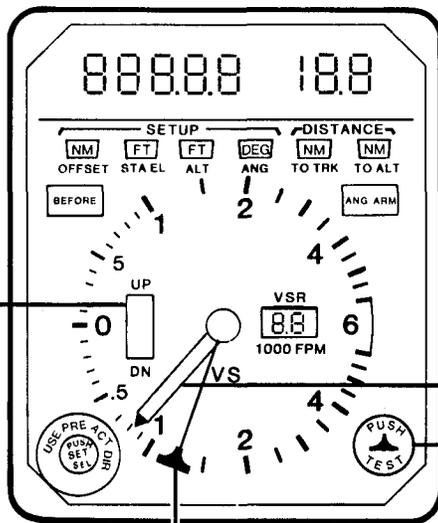


Fig. 6. Right Altimeter (ALT) indicator.



A VERTICAL NAVIGATION INDICATOR



Vertical speed pointer.
Scaled in fpm x 1000.

PUSH TEST knob.
Slews the VS bug when rotated and initiates VNI self test when pushed and released.

TEST

- VS pointer goes to 6000 FPM up.
- VS flag (red) appears.
- VS bug goes 6000 FPM down.
- OFFSET annunciator sequences from black to BEFORE to black to AFTER to black.
- ARM annunciator sequences from black to ANG ARM to black to VS ARM to black.
- SETUP and DISTANCE annunciators sequentially show:

ANNUNCIATOR	UNITS
OFFSET	NM
STA, EL	FT
ALT	FT
ANG	DEG
TO TRK	NM
TO ALT	NM

Vertical Speed (VS) bug.
Indicates selected VS when the FD/AP is in VS mode, and initial VS selected with the PUSH TST knob when not in the VS hold mode.

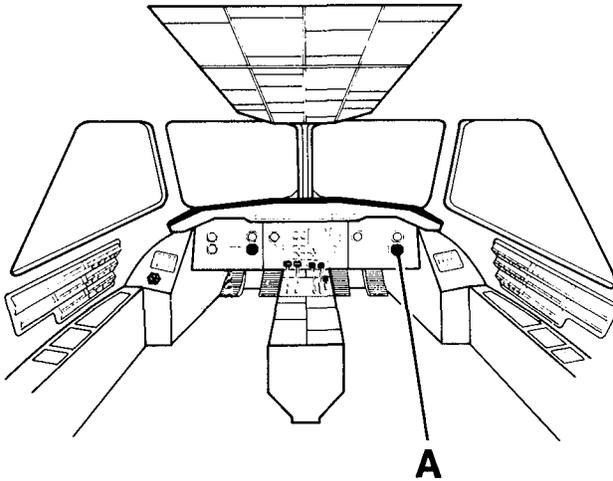
Warning flag (red).
Flag is indicated if:

- The test button is pressed.
- The VNAV indicator fails.
- Loss of data input.

- SETUP display indicates 888.8.8.
- DISTANCE display indicates 18.8.
- VSR display indicates 8.8.
- Back to normal.

Also see AOM 3.1 for detailed description/operation.

Fig. 8. Vertical Navigation, VNAV, indicator.



A RIGHT VERTICAL SPEED INDICATOR

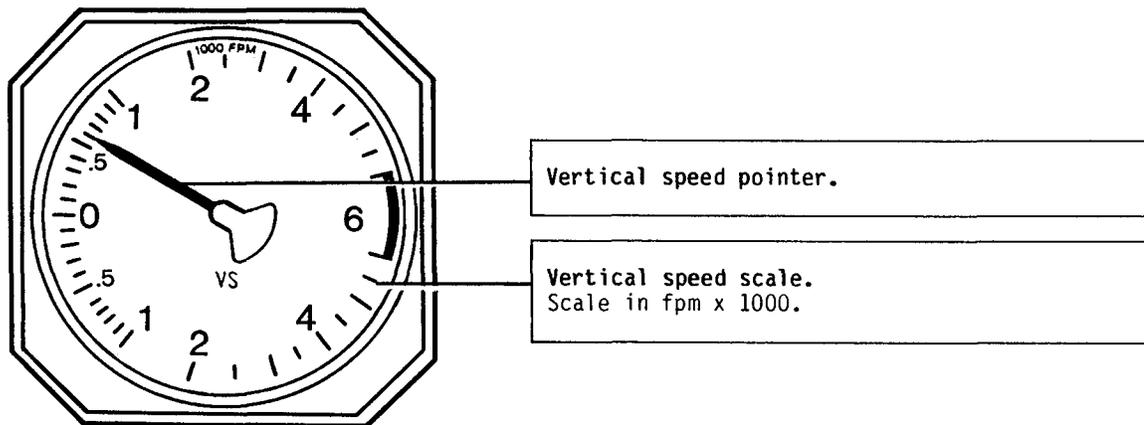
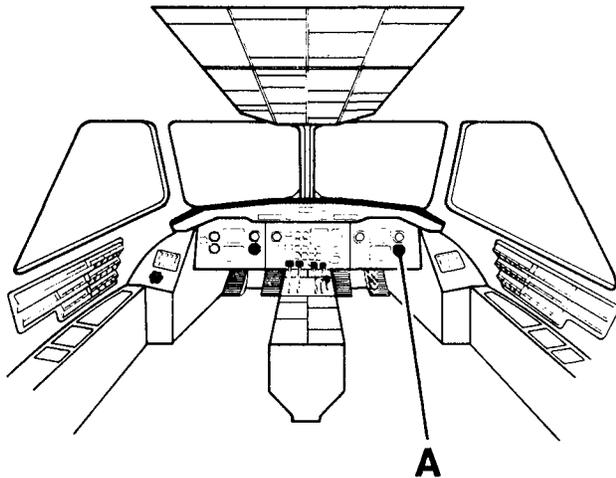


Fig. 8. Right Vertical Speed, VS, indicator.



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A RIGHT VERTICAL SPEED INDICATOR

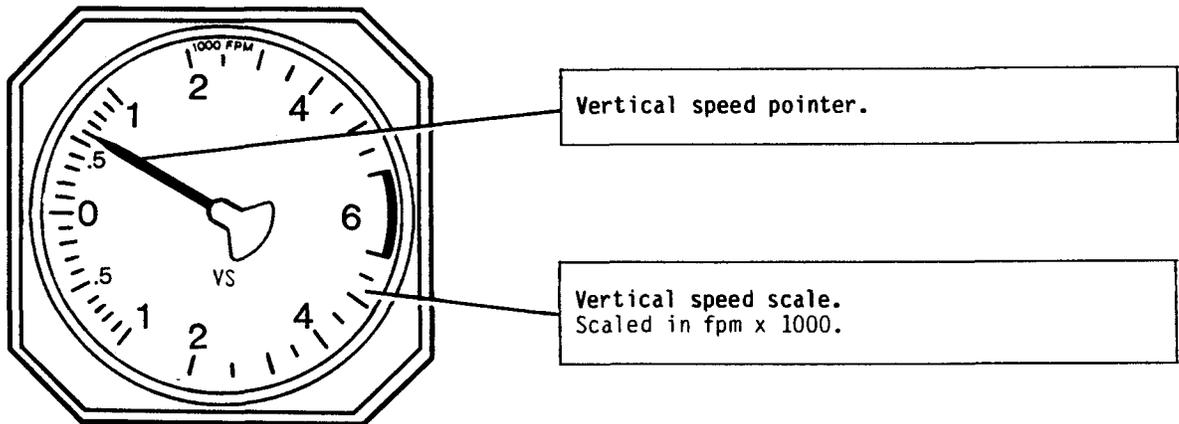
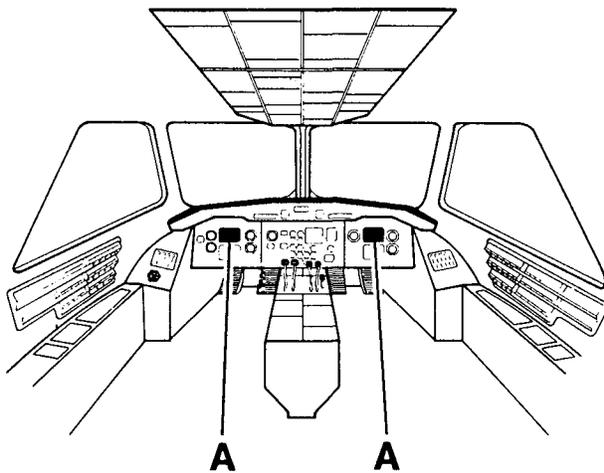


Fig. 8. Right Vertical Speed, VS, indicator.



A EADI

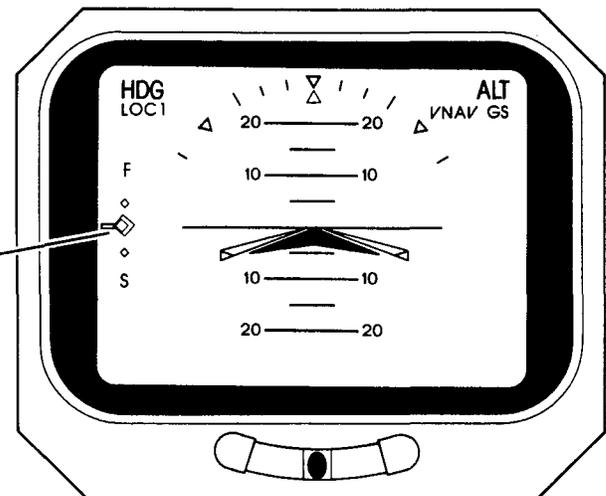
Fast-Slow speed indication.

Green diamond shaped pointer indicates the difference between the speed selected with the IAS bug on the IAS indicator and the actual IAS.

1 dot = 5 knots.

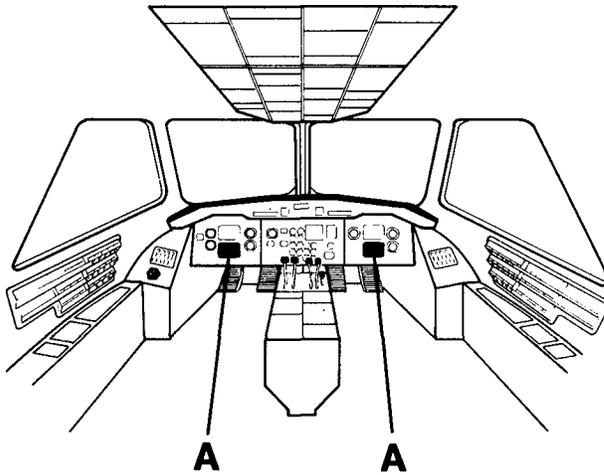
Fast or Slow index = 10 knots faster or slower than the selected speed.

If speed source fails, pointer turns to a red boxed SPD flag, flashes for 10 s then steady.



Also see AOM 3.1 0 AUTOFLIGHT.

Fig. 9. Fast-Slow speed indication.



A EHSI

TAS indication.
True airspeed in knots.
If ADC speed information fails, readout turns to red dashes, flashes for 10 s then steady.

SAT indication.
Static air temperature in degrees centigrade.
If ADC temperature information fails, readout turns to red dashes, flashes for 10 s then steady.

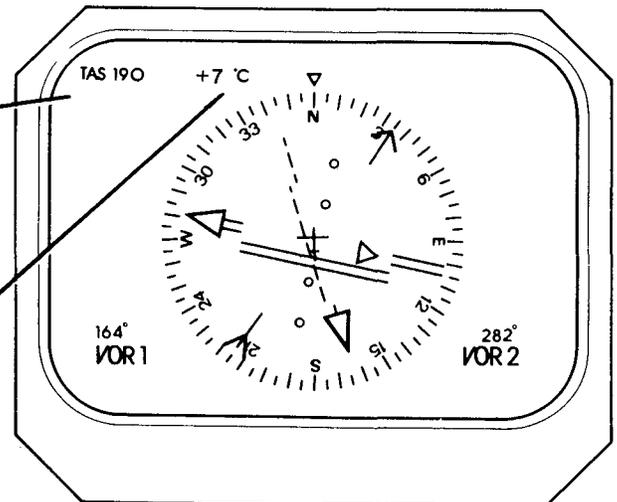
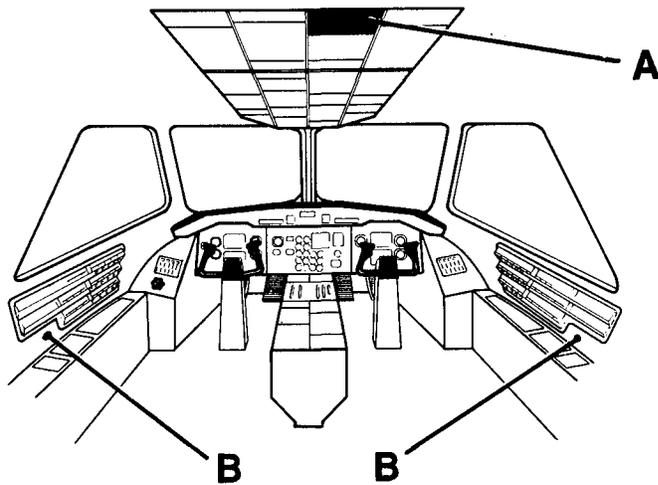


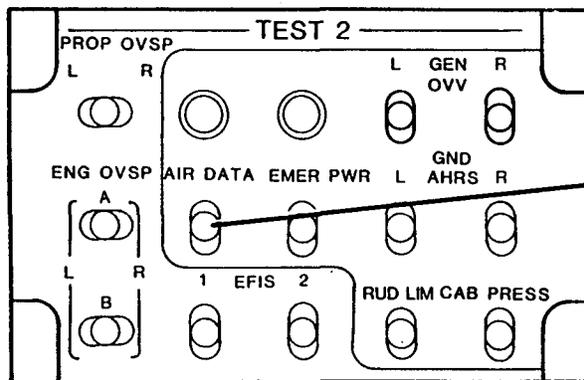
Fig. 10. True Airspeed, TAS and Static Air Temperature, SAT - indication.



INSTRUMENTS AND RECORDERS, AIR DATA SYSTEM Description



A TEST 2 PANEL

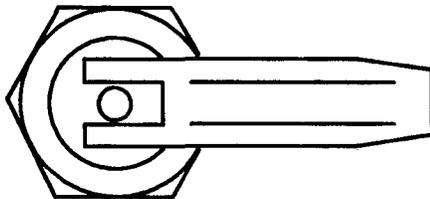


AIR DATA Computer test switch (for maintenance only).

When pressed and held on ground:
 - The left IAS, ALT and VS or VNAV indicators goes into test.
 - The overspeed warning comes on.

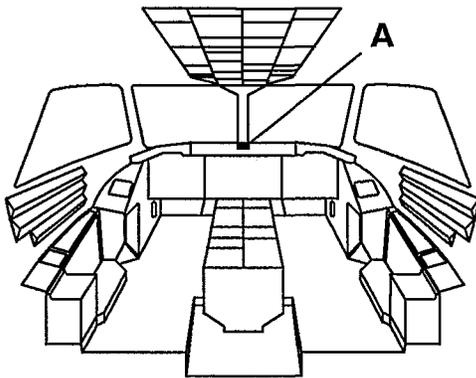
When pressed and held in the air:
 - Only the overspeed warning comes on.

B STATIC PRESSURE SHUTOFF VALVE

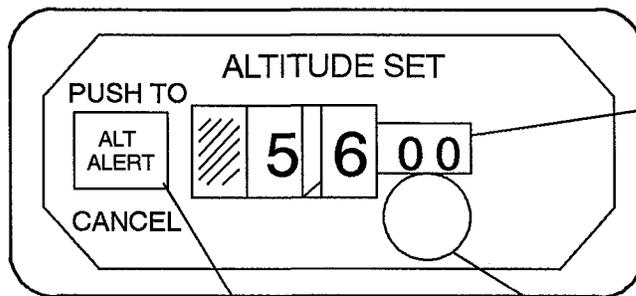


**STATIC PRESS
VALVE
LIFT TO CLOSE**

Fig. 11. Static pressure shutoff valve and ADC test switch.



A ALTITUDE PRESELECTION ALERTER



Selected altitude display.

- The two left digits displays thousands of feet.
- The digit right of the comma displays hundreds of feet.
- The last two digits are stationary zeros.
- The display will present a Warning Flag if a fault is detected.

Altitude set knob.

Turning the knob will change altitude in 100 feet increments.

ALT ALERT buttonlight (amber).

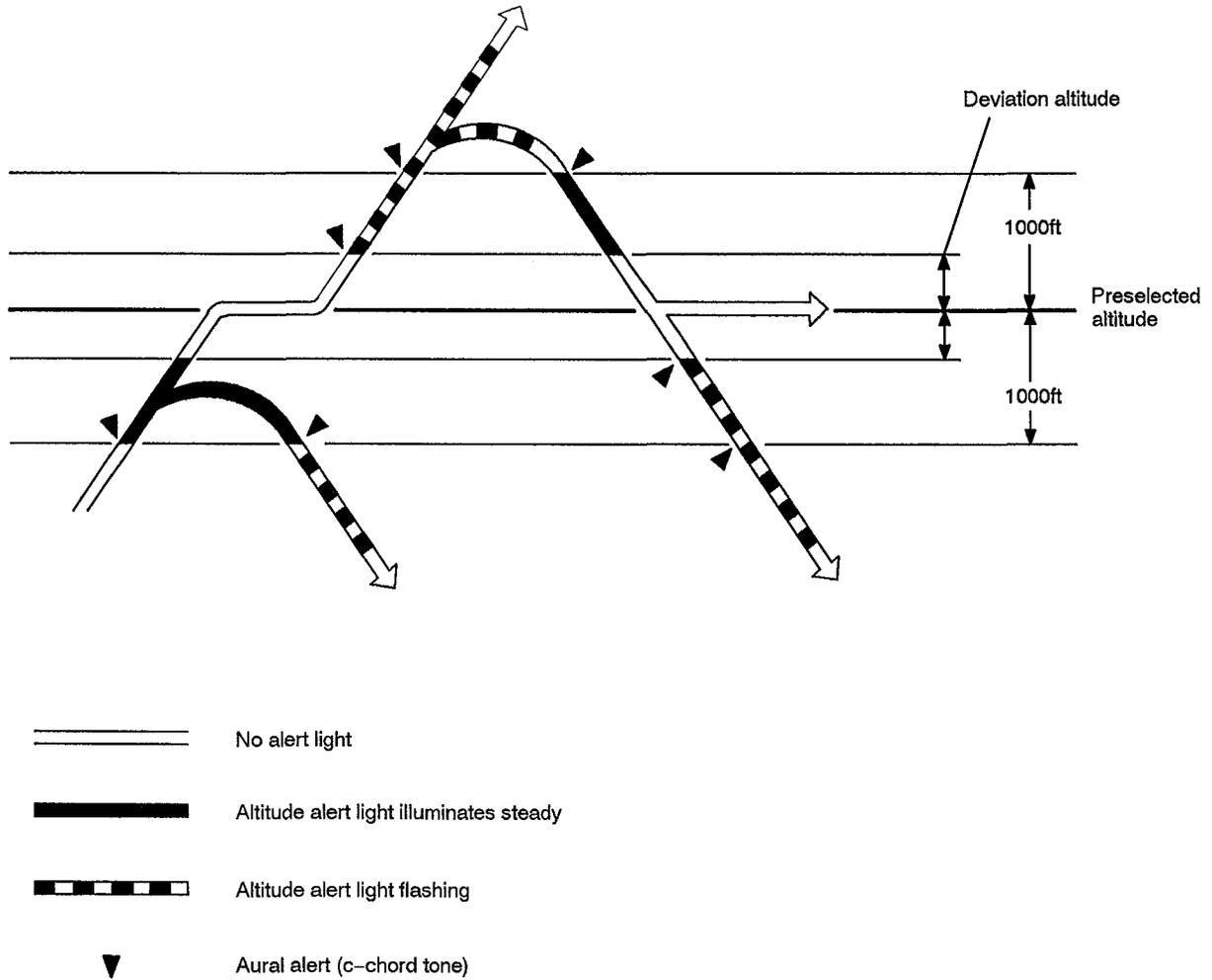
Illuminates steady when approaching, and flashes when deviating from selected altitude.

If an alert has been triggered, pressing the buttonlight will cancel the alert.

The buttonlight also incorporates a press to test feature. The Alert light comes on and the warning flag is activated when the buttonlight is pressed.

A12712

Fig. 12. Altitude Preselector Alerter (APA) – control and light.



Deviation altitude

300 ft deviation altitude alert with Collins PRE 80D P/N - 015.

200 ft deviation altitude alert with Collins PRE 80D P/N - 035.

Aircraft with S/N 180 - up has 200 ft deviation altitude alert.

A12719

Fig. 13. Altitude alert envelope.



4. ELECTRICAL POWER SUPPLY.

ADC/IAS indicator	L AVIONIC START BUS	F-15	ADC L ASI
ADC/altimeter	L AVIONIC START BUS	F-14	ADC L ALTIM
VSI/VNI preselect	L AVIONIC START BUS	F-13	LVSI/VNI PRESEL
Right altimeter vibrator	R ESSENTIAL BUS	M-9	ALTIM VIBR OVSP



1. LIMITATIONS.

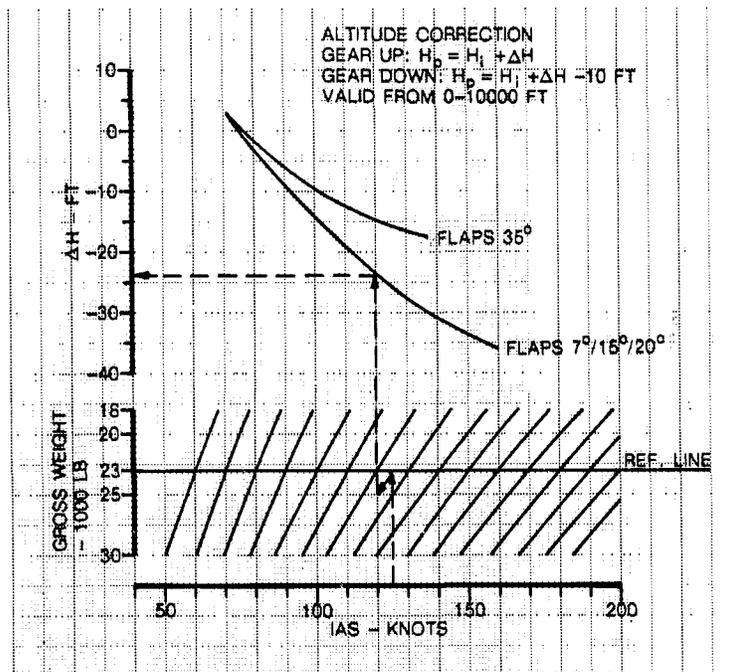
1.1. ALTIMETER OPERATIONAL TOLERANCES.

Deviation from true altitude at ground check and difference between two indicators according to national regulations.

1.2. AIRSPEED INDICATOR OPERATIONAL TOLERANCES.

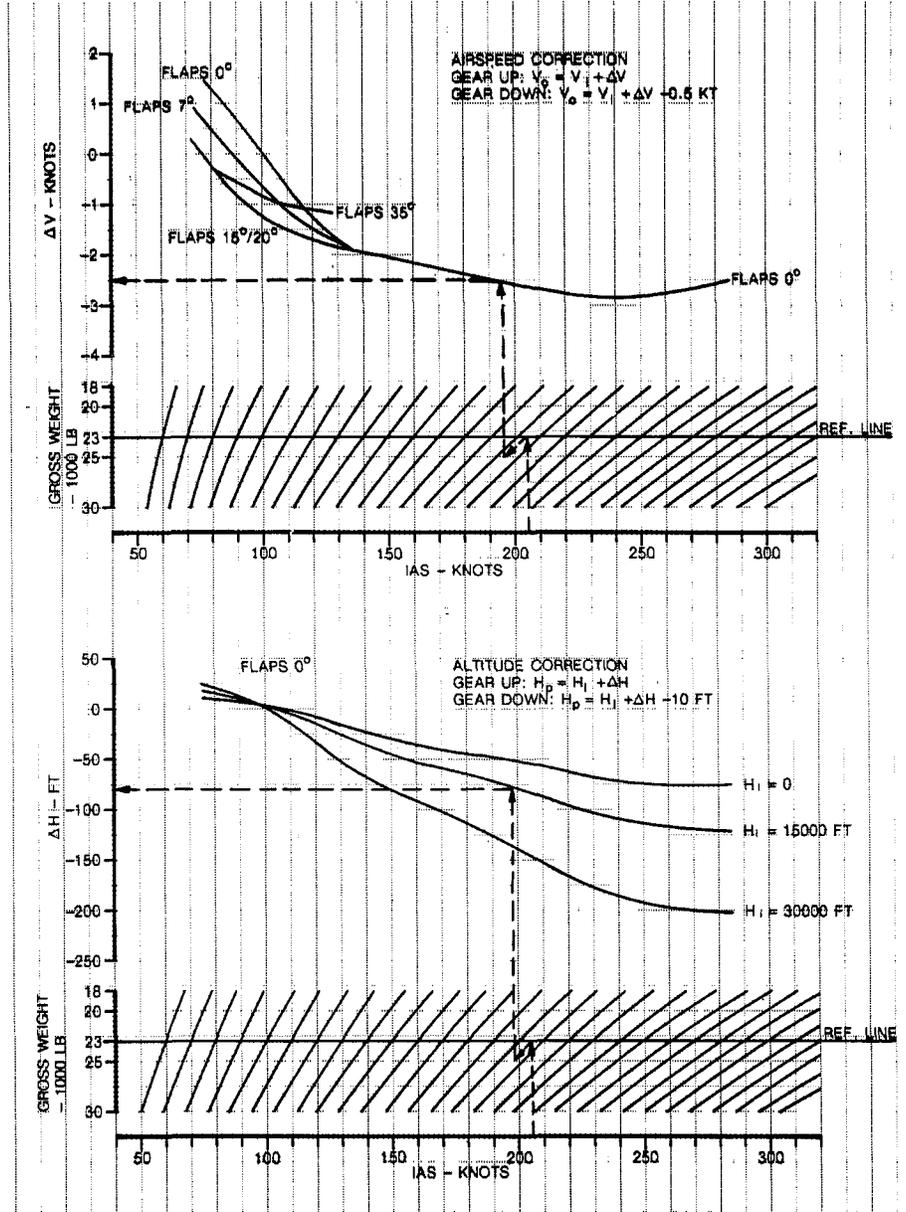
Difference between two indicators according to national regulations.

1.3. AIRSPEED INDICATOR AND ALTIMETER POSITION ERROR CORRECTION.





INSTRUMENTS AND RECORDERS, AIR DATA SYSTEM Operation





2. NORMAL OPERATION.

CONDITIONS	NORMAL PROCEDURES
<p>2. 1. POWER UP.</p>	<p>1. L and R AVION switches ON</p> <ul style="list-style-type: none"> - The Air Data system is switched ON/OFF by L and R AVION switches.
<p>2. 2. PREFLIGHT CHECK.</p>	<p>1. Altimeters SET AND CHECK</p> <ul style="list-style-type: none"> - On left indicator, check that no flag is visible. - Set all altimeters to local QNH or QFE as applicable and crosscheck the altimeters readout. - Check altimeters to indicate altitude of actual aircraft position as per national regulations. - Check difference between left, right and standby altimeters. <p>2. IAS indicator CHECK</p> <ul style="list-style-type: none"> - On left indicator, check that no flag is visible and indication at zero. - Check difference between left, right and standby IAS indicator. <p>3. Vertical speed indicators CHECK</p> <ul style="list-style-type: none"> - On left indicator, check that no flag is visible and indication at zero. - Check for no difference <p>4. SAT/TAS indication on EHSI CHECK</p> <ul style="list-style-type: none"> - Check that indication is normal.
<p>2. 3. OPERATION OF ALTITUDE PRE-SELECTOR AL-ERTER.</p>	<p>1. Altitude set knob SET DESIRED ALTITUDE.</p> <ul style="list-style-type: none"> - Monitor the system when approaching the selected altitude. - Verify altitude alert at 1000 ft prior to the set altitude and that the annunciation on the EADI changes from armed (ALTS in white) to capture (ALTS in green) when approaching the selected altitude. - This action will also provide selected altitude information to the autopilot for automatic altitude capture. Also see AOM 3.2., AUTOFLIGHT



CONDITIONS	NORMAL PROCEDURES
2. 4. VNAV (if installed).	1. See AOM 3.2., AUTOFLIGHT.



3. ABNORMAL OPERATION.

CONDITIONS	ABNORMAL PROCEDURES
<p>3. 1. ALTITUDE PRE-SELECTOR ALERter FLAG WARNING.</p>	<p>INDICATIONS.</p> <p>Altitude Preselector Alerter warning flag comes on.</p> <p>ACTIONS.</p> <ol style="list-style-type: none"> 1. CB F-13 L VSI/VNI PRESEL CHECK/RESET 2. End of procedure.
<p>3. 2. LEFT INSTRUMENTS ERRATIC.</p>	<p>INDICATIONS.</p> <p>Erratic or stuck indication on any of the left instruments:</p> <ul style="list-style-type: none"> - Airspeed; - Altimeter; - Vertical speed or VNAV (if installed). <p>ACTIONS.</p> <ul style="list-style-type: none"> ◆ - Only the Altimeter affected. <ol style="list-style-type: none"> 1. CB F-14 ADC L ALTIM CHECK/RESET 2. End of procedure. ◆ - Only the IAS indicator affected. <ol style="list-style-type: none"> 1. CB F-15 ADC L ASI CHECK/RESET 2. End of procedure. ◆ - Only the VS or VNAV indicator affected. <ol style="list-style-type: none"> 1. CB F-13 L VSI/VNI PRESEL CHECK/RESET 2. End of procedure. ◆ - All three instruments affected. <ol style="list-style-type: none"> 1. See Chapter 23, ABNORMAL PROCEDURE, ADC FAILURE. 2. End of procedure.



CONDITIONS	ABNORMAL PROCEDURES
<p>3. 3. RIGHT ALTIMETER VIB FLAG WARNING.</p>	<p>INDICATIONS.</p> <p>VIB flag in view.</p> <p>ACTIONS.</p> <ol style="list-style-type: none"> 1. CB M-9 ALTIM VIBR OVSP CHECK/RESET <ul style="list-style-type: none"> - If flag out of view – end of procedure. - If flag still in view – loss of vibrator means reduced accuracy. Crosscheck with L altimeter and/or standby altimeter. - End of procedure.
<p>3. 4. RIGHT INSTRUMENTS ERRATIC.</p>	<p>INDICATIONS.</p> <p>Erratic or stuck indication on any of the right instruments:</p> <ul style="list-style-type: none"> - Airspeed; - Altimeter; - Vertical speed. <p>ACTIONS.</p> <ol style="list-style-type: none"> 1. CB S-25 PROBE HEAT R PITOT CHECK/RESET 2. End of procedure. <p>PROBABLE CAUSE.</p> <ul style="list-style-type: none"> - Probable cause could be frozen or clogged pitot tube.
<p>3. 5. STBY INSTR. ERRATIC.</p>	<p>INDICATIONS.</p> <ul style="list-style-type: none"> - Standby altimeter and/or standby IAS indicator is erratic or stuck. <p>ACTIONS.</p> <ol style="list-style-type: none"> 1. CB's S-26, S-27 STBY PITOT CHECK/RESET 2. End of procedure. <p>PROBABLE CAUSE.</p> <ul style="list-style-type: none"> - Probable cause could be frozen or clogged pitot tube.



CONDITIONS	ABNORMAL PROCEDURES
<p>3. 6. DIFFERENTIAL INDICATION BETWEEN ANY OF THE INDICATIONS.</p>	<p>INDICATIONS.</p> <p>If differential indication appears between any of the airspeed and/or altimeter indicators:</p> <ul style="list-style-type: none"> - L and R side; - L and standby; - R and standby. <p>ACTIONS.</p> <div style="border: 1px dashed black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Not valid for leakage in the standby system.</p> </div> <ul style="list-style-type: none"> ◆ - If erratic indication on one side: <p style="margin-left: 20px;">On the erratic indication side:</p> <ol style="list-style-type: none"> 1. Static shut-off valve CLOSE 2. End of procedure. <ul style="list-style-type: none"> ◆ - If erratic indication on more than one side: <ol style="list-style-type: none"> 1. L and R static shut-off valve CLOSE 2. End of procedure. <div style="border: 1px dashed black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">CAUTION</p> <p style="text-align: center;">A static leakage in the right system can affect the cabin pressurization control. Be prepared to use MAN cabin pressure control.</p> </div>



1. GENERAL.

The aircraft is provided with one mechanical chronometer, located on left instrument panel. As an option, an additional chronometer is provided on the right instrument panel.

From A/C 300 and up the chronometer is electrical powered from either RH HOT BAT BUS or if HOT BAT not available, by its own internal battery. RH HOT BAT

BUS also supplies the optional second chronometer if installed.

The chronometer displays:

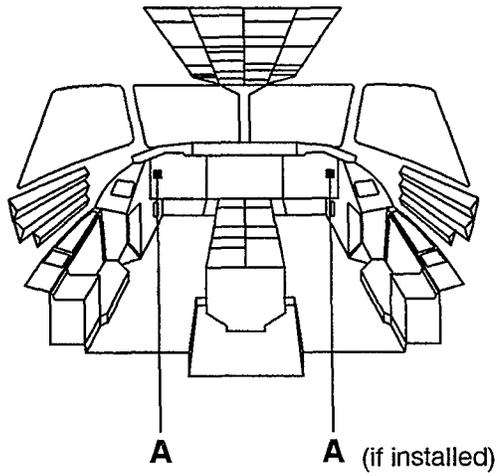
- Present time in hours and minutes.
- Elapsed time in minutes and seconds.

2. MAIN COMPONENTS AND SUBSYSTEMS.

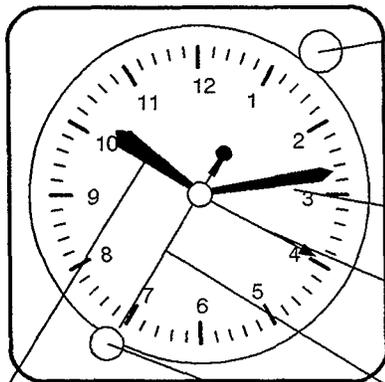
Not applicable.



3. CONTROLS AND INDICATORS.



A CHRONOMETER



Chronometer button.

Momentarily press button to:

- Start
- Stop
- Reset

Minute hand.

Elapsed time minutes.

Elapsed time seconds.

Hour hand.

Spring wind-up knob (only mechanical).

Pull knob and rotate to correct time.

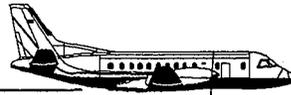
A11195

Fig. 1 Clock – controls and indicators.



4. ELECTRICAL POWER SUPPLY.

Chronometer R HOT BAT BUS M-17 CLOCK
(Both chronometers if option installed).



1. GENERAL.

The Flight Recorder system consists of four units:

- The Flight Data Acquisition Unit (FDAU) that collects and arranges the data;
- The Digital Flight Data Recorder (DFDR) that records the data on a magnetic tape;
- The Flight Recorder panel with monitoring lights;
- The triaxial accelerometer.

The Flight Recorder system becomes powered and starts to operate as soon as one engine is running and one generator on line.

2. MAIN COMPONENTS AND SUBSYSTEMS.

2. 1. Flight Data Acquisition Unit (FDAU).

The FDAU, 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 with a low rate. Analogue 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 on the recorder tape and recovered for analysis on ground, for example transcribed into more conveniently readable form, altitude in feet etc.

2. 2. Digital Flight Data Recorder (DFDR).

This is a recorder with a crashproof tape magazine installed in the rear compartment. The recorder uses magnetic tape and 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 tape is filled up, the oldest data is therefore automatically erased and new data entered instead. The tape may therefore be looked upon as an endless band, holding information from the last 25 flight hours. To prevent unintentional blanking of recorded data during ground stops or at maintenance, a relay controlled by either engine oil pressure 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 tape to be played back on ground for dumping of flight data.

2. 3. Flight Recorder Panel.

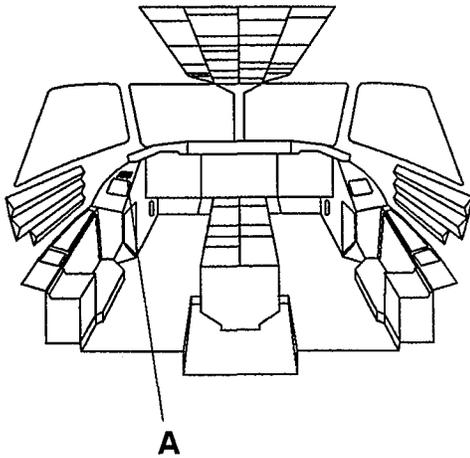
The panel is provided with caution lights for DFDR or FDAU failures and also an Event pushbutton to mark events during aircraft operation.

2. 4. Triaxial accelerometer.

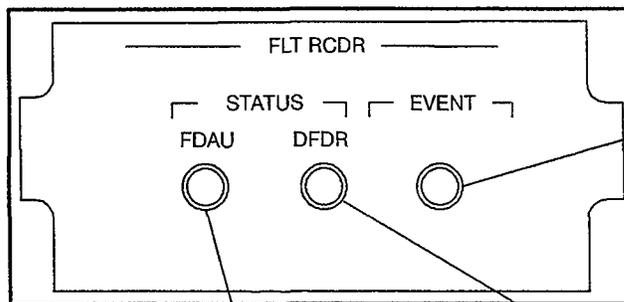
The accelerometer provides the system with data for vertical, longitudinal and lateral axis.



3. CONTROLS AND INDICATORS.



A FLIGHT RECORDER PANEL



EVENT button.

Press to mark events on the tape.

DFDR light (amber).

- Light goes out after first engine is started and one generator on line, indicating Flight Recorder is valid.
- Also comes on when the DFDR internal monitoring detects a failure.

FDAU light (amber).

Comes on when the FDAU internal monitoring detects a failure.

A11475

FIG. 1. Flight Recorder Panel – lights and button.



1. GENERAL.

The Flight Recorder system consists of four units:

- The Flight Data Acquisition Unit (FDAU) that collects and arranges the data.
- The Digital Flight Data Recorder (DFDR) that records the data on a magnetic tape.
- The Flight Data Entry Panel (FDEP) for insertion of documentary data and monitoring lights.
- The triaxial accelerometer.

The Flight Recorder system becomes powered and starts to operate as soon as one engine is running and one generator on line.

2. MAIN COMPONENTS AND SUBSYSTEMS.

2. 1. Flight Data Acquisition Unit (FDAU).

The FDAU, 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 with a low rate. Analogue 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 on the recorder tape and recovered for analysis on ground, for example transcribed into more conveniently readable form, altitude in feet etc.

2. 2. Digital Flight Data Recorder (DFDR).

This is a recorder with a crashproof tape magazine installed in the rear compartment. The recorder uses magnetic tape and 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 tape is filled up, the oldest data is therefore automatically erased and new data entered instead. The tape may therefore be looked upon as an endless band, holding information from the last 25 flight hours. To prevent unintentional blanking of recorded data during ground stops or at maintenance, a relay controlled by either engine oil pressure, 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 tape to be played back on ground for dumping of flight data.

2. 3. Flight Data Entry Panel (FDEP)

The FDEP is provided with thumb wheel switches and a pushbutton for selection and insert of flight data to be recorded on the tape.

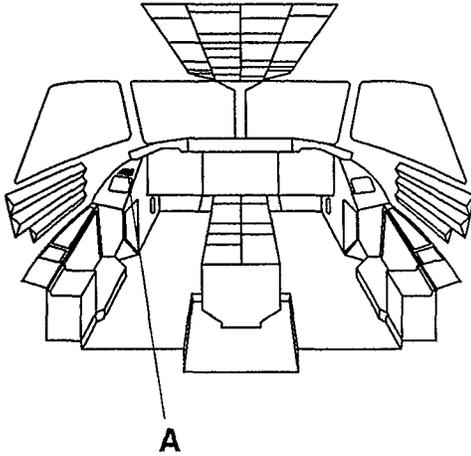
The panel is also provided with caution lights for DFDR or FDAU failures and also an Event pushbutton to mark events during aircraft operation.

2. 4. Triaxial accelerometer.

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



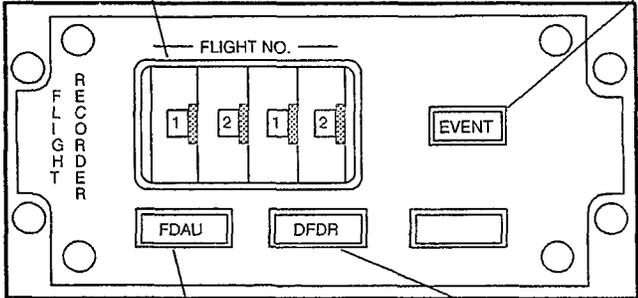
3. CONTROLS AND INDICATORS.



Thumb wheel switches.
Used to set operator flight/trip number data.

EVENT button.
Press to mark events on the tape.

A FLIGHT DATA ENTRY PANEL



FDAU light (amber).
Comes on when the FDAU internal monitoring detects a failure.

DFDR light (amber).
- Light goes out after first engine is started and one generator on line, indicating Flight Recorder is valid.
- Also comes on when the DFDR internal monitoring detects a failure.

A11477



1. GENERAL.

The Flight Recorder system consists of four units:

- The Flight Data Acquisition Unit (FDAU) that collects and arranges the data.
- The Digital Flight Data Recorder (DFDR) that records the data on a magnetic tape.
- The Flight Data Entry Panel (FDEP) for insertion of documentary data and monitoring lights.
- The triaxial accelerometer.

The Flight Recorder system becomes powered and starts to operate as soon as one engine is running and one generator on line.

2. MAIN COMPONENTS AND SUBSYSTEMS.

2. 1. Flight Data Acquisition Unit (FDAU).

The FDAU, 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 with a low rate. Analogue 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 on the recorder tape and recovered for analysis on ground, for example transcribed into more conveniently readable form, altitude in feet etc.

2. 2. Digital Flight Data Recorder (DFDR).

This is a recorder with a crashproof tape magazine installed in the rear compartment. The recorder uses magnetic tape and 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 tape is filled up, the oldest data is therefore automatically erased and new data entered instead. The tape may therefore be looked upon as an endless band, holding information from the last 25 flight hours. To prevent unintentional blanking of recorded data during ground stops or at maintenance, a relay controlled by either engine oil pressure, 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 tape to be played back on ground and for dumping of flight data.

2. 3. Flight Data Entry Panel (FDEP).

The FDEP is provided with thumb wheel switches and a pushbutton for selection and insert of flight data to be recorded on the tape.

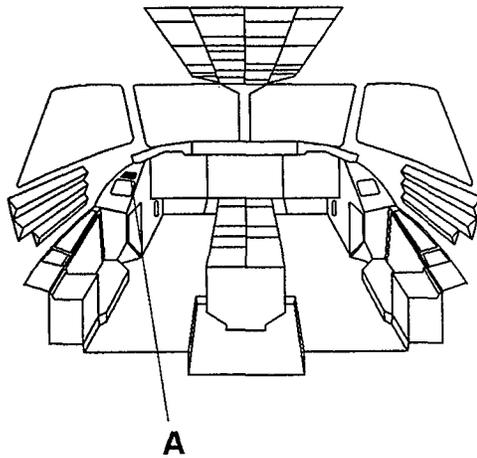
The panel is also provided with caution lights for DFDR or FDAU failures and also an Event pushbutton to mark events during aircraft operations.

2. 4. Triaxial accelerometer.

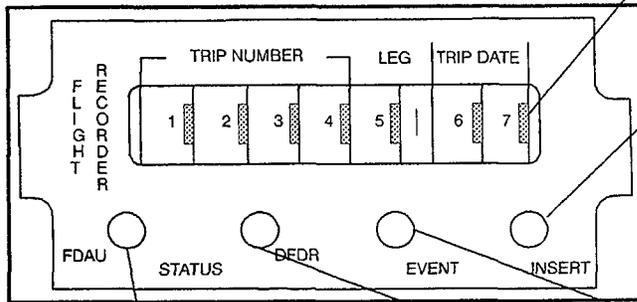
This accelerometer provides the system with data for vertical, longitudinal and lateral axis.



3. CONTROLS AND INDICATORS.



A FLIGHT DATA ENTRY PANEL



Thumb wheel switches.

Used to select flight data to be inserted.

INSERT button.

Press to insert selected flight data.

EVENT button.

Press to mark events on the tape.

FDAU light (amber).

Comes on when the FDAU internal monitoring detects a failure.

DFDR light (amber).

- Light goes out after first engine is started and one generator on line, indicating Flight Recorder is valid.

- Also comes on when the DFDR internal monitoring detects a failure.

A11476

FIG. 1. Flight Data Entry Panel – lights and buttons.



1. GENERAL.

The Flight Recorder system consists of four units:

- The Flight Data Acquisition Unit (FDAU) that collects and arranges the data.
- The Digital Flight Data Recorder (DFDR) that records the data on a magnetic tape.
- The Flight Data Entry Panel (FDEP) for insertion of documentary data and monitoring lights.
- The triaxial accelerometer.

The Flight Recorder system becomes powered and starts to operate as soon as one engine is running and one generator on line.

2. MAIN COMPONENTS AND SUBSYSTEMS.

2. 1. Flight Data Acquisition Unit (FDAU).

The FDAU, 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 with a low rate. Analogue 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 on the recorder tape and recovered for analysis on ground, for example transcribed into more conveniently readable form, altitude in feet etc.

2. 2. Digital Flight Data Recorder (DFDR).

This is a recorder with a crashproof tape magazine installed in the rear compartment. The recorder uses magnetic tape and 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 tape is filled up, the oldest data is therefore automatically erased and new data entered instead. The tape may therefore be looked upon as an endless band, holding information from the last 25 flight hours. To prevent unintentional blanking of recorded data during ground stops or at maintenance, a relay controlled by either engine oil pressure, 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 tape to be played back on ground and for dumping of flight data.

2. 3. Flight Data Entry Panel (FDEP).

The FDEP is provided with thumb wheel switches and a pushbutton for selection and insert of flight data to be recorded on the tape.

The panel is also provided with caution lights for DFDR or FDAU failures and also an Event pushbutton to mark events during aircraft operations. The FDEP also has a MEM light to indicate that the FDAU/ETM memory storage capacity is 80% full.

2. 4. Triaxial accelerometer.

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

2. 5. Engine Trend Monitoring

A totally independent function is also available in the FDAU. This independently operating microprocessor controlled feature samples certain parameters available through the existing "normal" FDAU processing and decides when certain conditions are met to sample engine performance. This function is normally referred to as Engine Trend Monitoring (ETM) and the following ETM conditions are monitored:

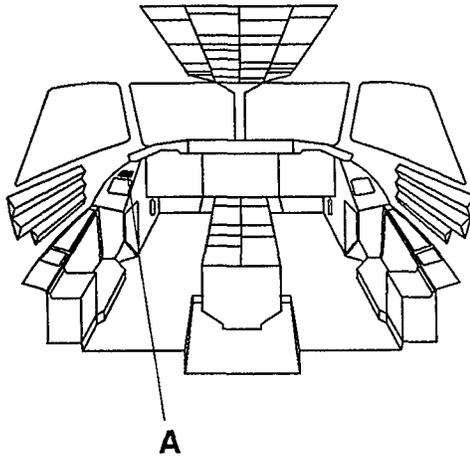
- (1) Takeoff Report
- (2) Cruise Report
- (3) Limit Exceedance Report
- (4) Event Marker Report

The ETM function can store up to 30 takeoff and cruise reports (i.e. 15 flights), 20 event marker and 20 exceedance reports. Subsequent reports will overwrite the oldest reports stored.

When 80% of available memory capacity is used up (i.e. 24 "normal" flights), the FDAU will activate a MEMory light on the Flight Data Entry Panel. This light only serves to alert the crew of impending memory overwrite and subsequent loss of old data.

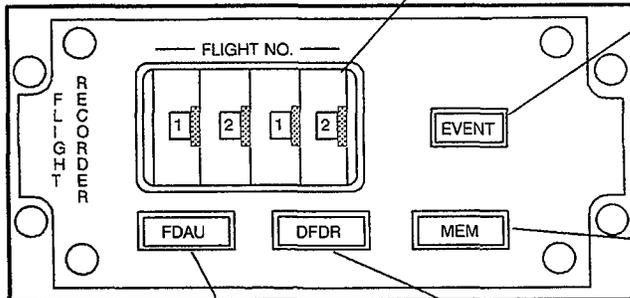


3. CONTROLS AND INDICATORS.



Thumb wheel switches.
Used to set operator flight/trip number data.

A FLIGHT DATA ENTRY PANEL



EVENT button.
Press to mark events on the tape and to enter event data in ETM.

MEM light (white) (maintenance).
Comes on when 80% of the ETM memory capacity is full. Memory should be dumped shortly to prevent from loss of data.

DFDR light (amber).
- Light goes out after first engine is started and one generator on line, indicating Flight Recorder is valid.
- Also comes on when the DFDR internal monitoring detects a failure.

FDAU light (amber).
Comes on when the FDAU internal monitoring detects a failure.

A11478

FIG. 1. Flight Data Entry Panel – lights and buttons.



4. ELECTRICAL POWER SUPPLY.

Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:

Flight recorder	L INV BUS 115 VAC	F–19	RECORD FLIGHT
FDAU	R AVIONIC BUS	M–19	FLIGHT DATA AQUIS

Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:

Flight recorder	R INV BUS 115 VAC	M–19	RECORD FLIGHT
FDAU	L AVIONIC BUS	F–19	DATA AQUIS PWR
FDAU	EMER BUS	F–18	DATA AQUIS BACK–UP PWR (Optional)



1. LIMITATIONS.

Not applicable.

2. NORMAL OPERATION.

CONDITIONS	NORMAL PROCEDURES
<p>2. 1. POWER UP.</p>	<p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none"> 1. R AVION and MAIN INV switches ON <ul style="list-style-type: none"> – Power is applied to the Flight Recorder by R AVION and MAIN INV switches. – The Flight Recorder will be switched on by a relay controlled by engine oil pressure after engine start. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none"> 1. L AVION and MAIN INV switches ON <ul style="list-style-type: none"> – Power is applied to the Flight Recorder by L AVION and MAIN INV switches. – The Flight Recorder will be switched on by a relay controlled by engine oil pressure after engine start.
<p>2. 2. AFTER ENGINE START (ONE ENGINE RUNNING).</p>	<ol style="list-style-type: none"> 1. DFDR light CHECK. <ul style="list-style-type: none"> – Check light to be out when one generator on line.
<p>2. 3. EVENT.</p>	<ol style="list-style-type: none"> 1. EVENT button PRESS <ul style="list-style-type: none"> – A mark will be made on the tape. – The mark will make it easier to find such periods of the flight that can be interesting to study afterwards.



3. ABNORMAL OPERATION.

CONDITIONS	ABNORMAL PROCEDURES
<p>3. 1. DFDR LIGHT ON.</p>	<p>ACTION.</p> <p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none"> 1. CB F–19, RECORD FLIGHT CHECK/RESET 2. End of procedure. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none"> 1. CB M–19, RECORD FLIGHT CHECK/RESET 2. End of procedure.
<p>3. 2. FDAU LIGHT ON.</p>	<p>ACTION.</p> <p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none"> 1. CB M–19, FLIGHT DATA ACQUIS CHECK/RESET 2. End of procedure. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none"> 1. CB F–19, DATA ACQUIS PWR CHECK/RESET 2. End of procedure.



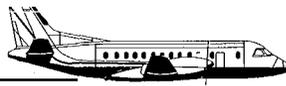
1. LIMITATIONS.

Not applicable.

2. NORMAL OPERATION.

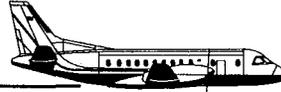
CONDITIONS	NORMAL PROCEDURES
<p>2. 1. POWER UP.</p>	<p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none"> 1. R AVION and MAIN INV switches ON <ul style="list-style-type: none"> – Power is applied to the Flight Recorder by R AVION and MAIN INV switches. – The Flight Recorder will be switched on by a relay controlled by engine oil pressure after engine start. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none"> 1. L AVION and MAIN INV switches ON <ul style="list-style-type: none"> – Power is applied to the Flight Recorder by L AVION and MAIN INV switches. – The Flight Recorder will be switched on by a relay controlled by engine oil pressure after engine start.
<p>2. 2. ENTRY OF FLIGHT DATA.</p>	<p>PRESTART.</p> <ol style="list-style-type: none"> 1. Flight data entry panel SET <ul style="list-style-type: none"> – Trip number. – Leg. – Trip date. <p>AFTER ENGINE START (ONE ENGINE RUNNING).</p> <ol style="list-style-type: none"> 1. DFDR light CHECK <ul style="list-style-type: none"> – Check light to be out when one generator on line. 2. INSERT button PRESS <ul style="list-style-type: none"> – Press button to insert flight data to the Flight recorder.
<p>2. 3. EVENT.</p>	<ol style="list-style-type: none"> 1. EVENT button PRESS <ul style="list-style-type: none"> – A mark will be made on the tape. – The mark will make it easier to find such periods of the flight that can be interesting to study afterwards.





3. ABNORMAL OPERATION.

CONDITIONS	ABNORMAL PROCEDURES
<p>3. 1. DFDR LIGHT ON.</p>	<p>ACTION.</p> <p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none"> 1. CB F–19, RECORD FLIGHT CHECK/RESET 2. End of procedure. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none"> 1. CB M–19, RECORD FLIGHT CHECK/RESET 2. End of procedure.
<p>3. 2. FDAU LIGHT ON.</p>	<p>ACTION.</p> <p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none"> 1. CB M–19, FLIGHT DATA ACQUIS CHECK/RESET 2. End of procedure. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none"> 1. CB F–19, DATA ACQUIS PWR CHECK/RESET 2. End of procedure.



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 with its crashproof housing is installed in the rear compartment.

The CVR operates continuously as soon as L BAT and ESS AVION switches are set to ON.

The CVR records audio communication directly from the Remote Electronic Unit (REU) on three separate channels for pilot, copilot and 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 is 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.

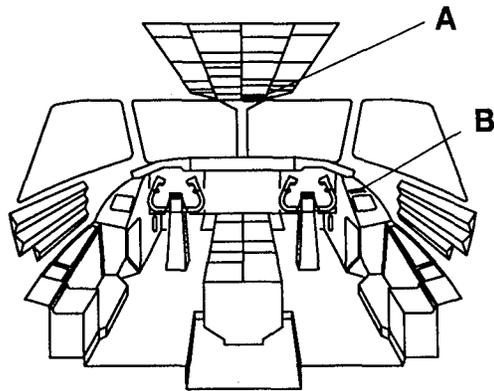
An Inertia switch will switch off the CVR saving the records if the aircraft longitudinal G-load exceeds 2.5 G.

2. MAIN COMPONENTS AND SUBSYSTEMS.

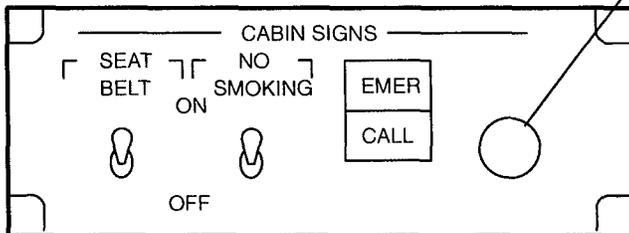
Not applicable.



3. CONTROLS AND INDICATORS.

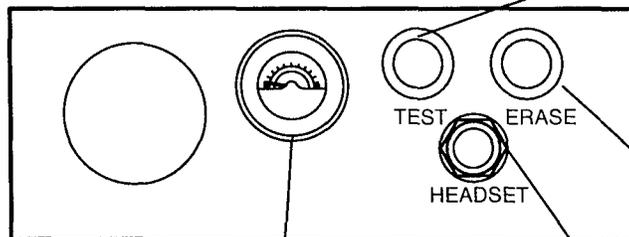


A CABIN SIGN PANEL



Cockpit area microphone.

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.

Headset output.

Used to monitor present recordings.

Monitor meter.

A11580

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



4. ELECTRICAL POWER SUPPLY.

Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:

Voice recorder L BAT BUS F-18 RECORD VOICE

Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:

Voice recorder L BAT BUS E-15 RECORD VOICE



1. GENERAL.

The Cockpit Voice Recorder (CVR) records the last 2 hours of cockpit communications and sounds using a four channel endless magnetic tape. The recorder with its crashproof housing is installed in the rear compartment.

The CVR operates continuously as soon as L BAT and ESS AVION switches are set to ON.

The CVR records audio communication directly from the Remote Electronic Unit (REU) on three separate channels for pilot, copilot and 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 is 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.

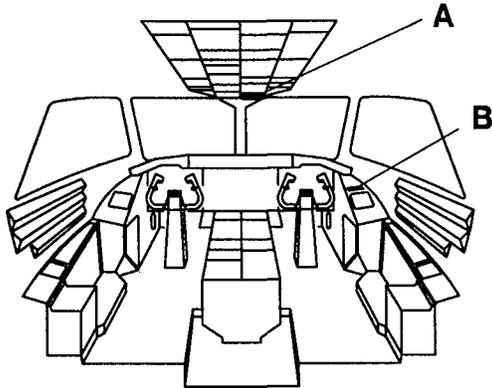
An Inertia switch will switch off the CVR saving the records if the aircraft longitudinal G-load exceeds 2.5 G.

2. MAIN COMPONENTS AND SUBSYSTEMS.

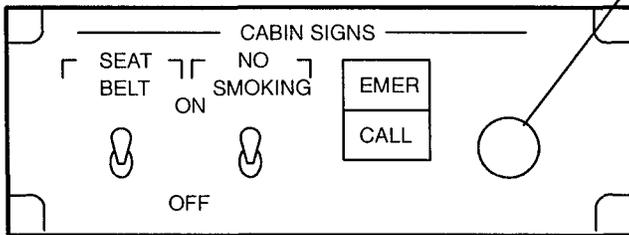
Not applicable.



3. CONTROLS AND INDICATORS.

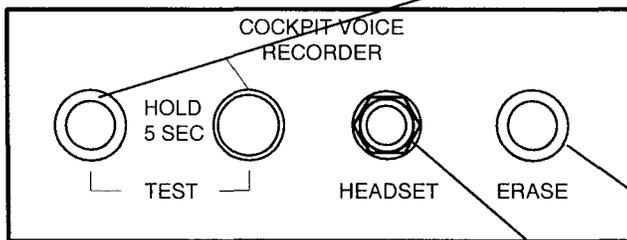


A CABIN SIGN PANEL



Cockpit area microphone.

B CVR CONTROL PANEL



TEST button and TEST light.

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 on the tape will be erased.

Headset output.

Used to monitor present recordings.

A15786

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



4. ELECTRICAL POWER SUPPLY.

Voice recorder L BAT BUS E-15 RECORD VOICE ■



1. GENERAL.

The Solid State Cockpit Voice Recorder (SSCVR) records the last 30 minutes 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 LH BAT BUS is powered and ESS AVION switch is set to ON. It will continue to operate until a force of more than 2G opens the contacts of the inertia switch, or the ESS AVION switch is set to OFF.

The SSCVR records audio from four communication channels, the PA system, the pilot and co-pilot communication and the audio in the flight compartment area. The CVR continuously records each of the four audio inputs in the solid state flash memory for a maximum period of 30 minutes, before new data is recorded.

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

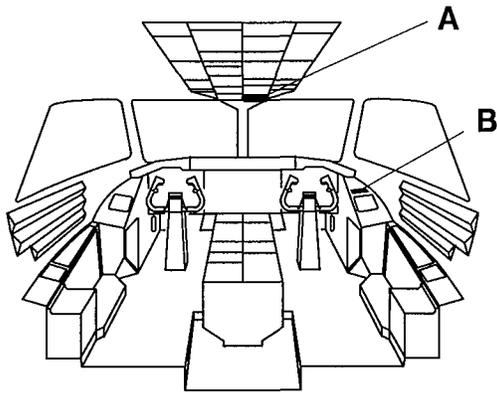
The recorder is provided with an underwater locator beacon which is automatically started when submerged in water. The locator is battery powered and will send out acoustic signals for 30 days.

2. MAIN COMPONENTS AND SUBSYSTEMS.

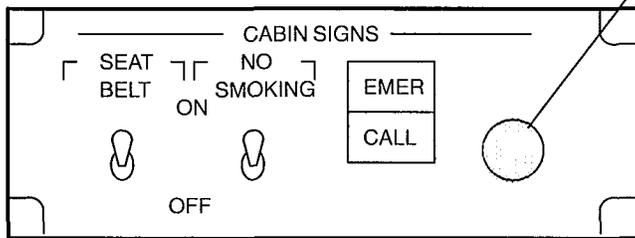
Not applicable.



3. CONTROLS AND INDICATORS.

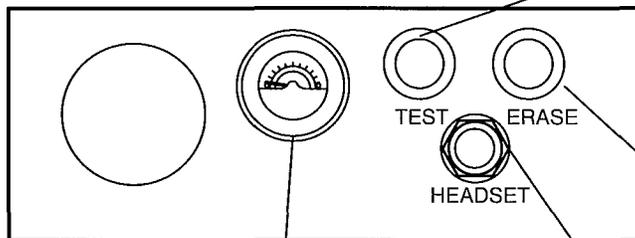


A CABIN SIGN PANEL



Cockpit area microphone.

B CVR CONTROL PANEL



TEST button.

When pressed, an internal test starts producing:
 -A 800 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 all data in the solid state flash memories will be erased.

Monitor meter.

Headset output.

Used to monitor present recordings.

A11580

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

12/4.1

Applicable to A/C with Solid State with 30 minutes recording time

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4. ELECTRICAL POWER SUPPLY.

Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:

Voice recorder L BAT BUS F-18 RECORD VOICE

Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:

Voice recorder L BAT BUS E-15 RECORD VOICE



1. GENERAL.

The Solid State Cockpit Voice Recorder (SSCVR) records the last 2 hours 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 until a force of more than 2G opens the contacts of the inertia switch, or the ESS AVION switch is set to OFF.

The SSCVR records four audio communication channels from the PA system, the pilots communication and the audio in the flight compartment area. The CVR continuously records each of the four audio inputs in the solid state flash memory for a maximum period of 30 minutes, before new data is recorded.

With a Solid State Cockpit Voice Recorder with 2 hours recording time is installed, both pilots and the PA communications are combined in a fifth audio channel and in the sixth audio channel the audio in the flight compartment is recorded by the cockpit area microphone. Both the fifth and the sixth audio channel are recording with a standard quality for 2 hours.

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

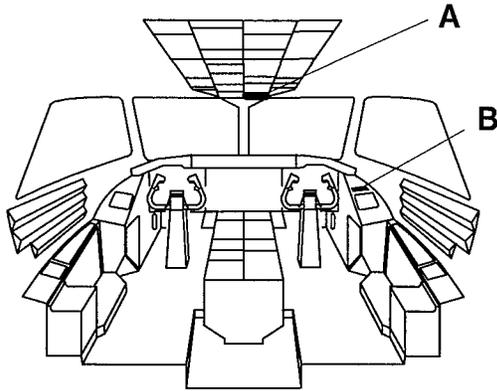
The recorder is provided with an underwater locator beacon which is automatically started when submerged in water. The locator is battery powered and will send out acoustic signals for 30 days.

2. MAIN COMPONENTS AND SUBSYSTEMS.

Not applicable.

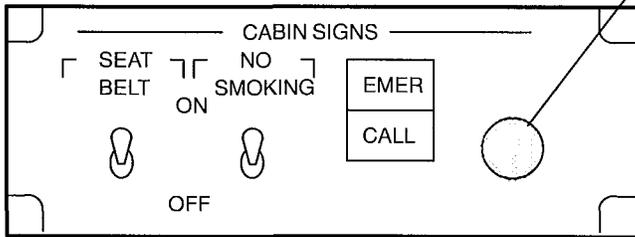


3. CONTROLS AND INDICATORS.

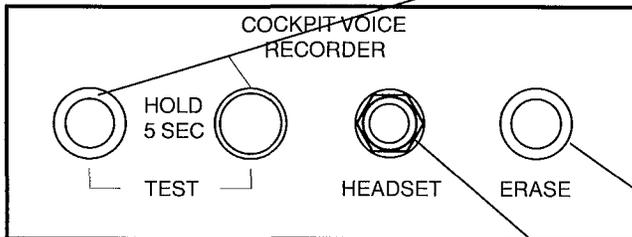


Cockpit area microphone.

A CABIN SIGN PANEL



B CVR CONTROL PANEL



TEST button and TEST light.

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 all data in the solid state flash memories is erased.

Headset output.

Used to monitor present recordings.

A15786

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



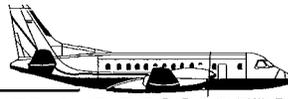
4. ELECTRICAL POWER SUPPLY.

Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:

Voice recorder L BAT BUS F-18 RECORD VOICE

Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:

Voice recorder L BAT BUS E-15 RECORD VOICE



1. LIMITATIONS.

Not applicable.

2. NORMAL OPERATION.

CONDITIONS	NORMAL PROCEDURES
2. 1. POWER UP.	1. ESS AVION switch ON The Cockpit Voice Recorder is switched ON/OFF by ESS AVION switch.
2. 2. PREFLIGHT TEST.	1. TEST button PRESS AND HOLD – Monitor meter shall give green band indication. – An audio tone (600 Hz) shall be heard in the HEADSET output. 2. TEST button RELEASE
2. 3. ERASING.	Total erasing is possible only on ground and with gust lock set as follows: 1. ERASE button PRESS – Press for at least 2 seconds.
2. 4. SAVING THE RECORDINGS.	The voice recorder holds only the recording of the last 30 minutes and if these records are to be preserved, pull CB RECORD VOICE. For A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948, pull F–18 RECORD VOICE. For A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP, pull E–15 RECORD VOICE. – The Recorder should normally never be stopped when the aircraft is moving on ground or is airborne. – After engine shutdown, the recorder might be stopped at the pilots discretion. – If an emergency situation has occurred and the aircraft has come to a final stop, the recorder shall be stopped if possible. If executing the "EMERGENCY EVACUATION" checklist the recorder is automatically stopped.



3. ABNORMAL OPERATION.

CONDITIONS	ABNORMAL PROCEDURES
3. 1. FAILURE AT TEST.	<p>ACTION.</p> <p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none">1. CB F–18, RECORD VOICE CHECK/RESET2. End of procedure. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none">1. CB E–15, RECORD VOICE CHECK/RESET2. End of procedure.



1. LIMITATIONS.

Not applicable.

2. NORMAL OPERATION.

CONDITIONS	NORMAL PROCEDURES
<p>2. 1. POWER UP.</p>	<p>1. ESS AVION switch ON The Cockpit Voice Recorder is switched ON/OFF by ESS AVION switch.</p>
<p>2. 2. PREFLIGHT TEST.</p>	<p>1. TEST button PRESS AND HOLD 5 SEC – The green TEST light shall come on. – An audio tone (600 Hz) shall be heard in the HEADSET output.</p> <p>2. TEST button RELEASE – The green TEST light shall go out.</p>
<p>2. 3. ERASING.</p>	<p>Total erasing is possible only on ground and with gust lock set as follows:</p> <p>1. ERASE button PRESS – Press for at least 2 seconds.</p>
<p>2. 4. SAVING THE RECORDINGS.</p>	<p>The voice recorder holds only the recording of the last 2 hours and if these records are to be preserved, pull CB E-15 RECORD VOICE.</p> <p>– The Recorder should normally never be stopped when the aircraft is moving on ground or is airborne. – After engine shutdown, the recorder might be stopped at the pilots discretion. – If an emergency situation has occurred and the aircraft has come to a final stop, the recorder shall be stopped if possible. If executing the "EMERGENCY EVACUATION" checklist the recorder is automatically stopped.</p>



3. ABNORMAL OPERATION.

CONDITIONS	ABNORMAL PROCEDURES
3. 1. FAILURE AT TEST.	ACTION. 1. CB E-15, RECORD VOICE CHECK/RESET 2. End of procedure.



1. LIMITATIONS.

Not applicable.

2. NORMAL OPERATION.

CONDITIONS	NORMAL PROCEDURES
<p>2. 1. POWER UP.</p>	<p>1. ESS AVION switch ON The Cockpit Voice Recorder is switched ON/OFF by ESS AVION switch.</p>
<p>2. 2. PREFLIGHT TEST.</p>	<p>1. TEST button PRESS AND HOLD – Monitor meter shall give green band indication. – An audio tone (800 Hz) shall be heard in the HEADSET output.</p> <p>2. TEST button RELEASE</p>
<p>2. 3. ERASING.</p>	<p>Total erasing is possible only on ground and with gust lock set as follows:</p> <p>1. ERASE button PRESS – Press for at least 2 seconds.</p>
<p>2. 4. SAVING THE RECORDINGS.</p>	<p>The voice recorder holds only the recording of the last 30 minutes and if these records are to be preserved, pull CB RECORD VOICE. For A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948, pull F–18 RECORD VOICE. For A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP, pull E–15 RECORD VOICE.</p> <p>– The Recorder should normally never be stopped when the aircraft is moving on ground or is airborne. – After engine shutdown, the recorder might be stopped at the pilots discretion. – If an emergency situation has occurred and the aircraft has come to a final stop, the recorder shall be stopped if possible. If executing the "EMERGENCY EVACUATION" checklist the recorder is automatically stopped.</p>



3. ABNORMAL OPERATION.

CONDITIONS	ABNORMAL PROCEDURES
<p>3. 1. FAILURE AT TEST.</p>	<p>ACTION.</p> <p>Applicable for A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948:</p> <ol style="list-style-type: none"> 1. CB F–18, RECORD VOICE CHECK/RESET 2. End of procedure. <p>Applicable for A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP:</p> <ol style="list-style-type: none"> 1. CB E–15, RECORD VOICE CHECK/RESET 2. End of procedure.



1. LIMITATIONS.

Not applicable.

2. NORMAL OPERATION.

CONDITIONS	NORMAL PROCEDURES
<p>2. 1. POWER UP.</p>	<p>1. ESS AVION switch ON The Cockpit Voice Recorder is switched ON/OFF by ESS AVION switch.</p>
<p>2. 2. PREFLIGHT TEST.</p>	<p>1. TEST button PRESS AND HOLD 5 SEC – The green TEST light shall come on. – Two audio tones (600 Hz) shall be heard in the HEADSET output.</p> <p>2. TEST button RELEASE – The green TEST light shall go out.</p>
<p>2. 3. ERASING.</p>	<p>Total erasing is possible only on ground and with gust lock set as follows:</p> <p>1. ERASE button PRESS – Press for at least 2 seconds.</p>
<p>2. 4. SAVING THE RECORDINGS.</p>	<p>The voice recorder holds only the recording of the last 2 hours and if these records are to be preserved, pull CB RECORD VOICE. For A/C 160–249 without Mod. No. 2245 and/or without Mod. No. 2948, pull F–18 RECORD VOICE. For A/C 160–249 with Mod. No. 2245 and/or with Mod. No. 2948, and for A/C 250–UP, pull E–15 RECORD VOICE.</p> <p>– The Recorder should normally never be stopped when the aircraft is moving on ground or is airborne. – After engine shutdown, the recorder might be stopped at the pilots discretion. – If an emergency situation has occurred and the aircraft has come to a final stop, the recorder shall be stopped if possible. If executing the "EMERGENCY EVACUATION" checklist the recorder is automatically stopped.</p>