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A. A50 audio control panel		1	
B. E38 marker antenna		2	
4. OPERATION		2	
 INDEPENDENT POSITION DETERMINING DESCRIPTION AND OPERATION	 34-40-00 (BA)	 1	 OPTION
1. GENERAL		1	
2. DESCRIPTION		1	
A. Stormscope system		1	
 STORMSCOPE DESCRIPTION AND OPERATION	 34-41-00 (BE)	 1	 WX 1000
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	
 STORMSCOPE DESCRIPTION AND OPERATION	 34-41-00 (BI)	 1	 WX 500
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		3	
A. A74 processor		3	
B. E41 antenna		3	
C. S133 "STORM" switch		3	
D. A90 26V/400Hz converter (option)		3	
4. OPERATION		3	
A. Energization		3	
B. "CELL" mode		4	
C. "STRIKE" mode		4	
A. Energization		4	
B. "CELL" mode		5	
C. "STRIKE" mode		5	
 STORMSCOPE DESCRIPTION AND OPERATION	 34-41-00 (BM)	 1	 WX 1000+
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	

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SUBJECT	CHAPTER	PAGE	VALIDITY
STORMSCOPE	34-41-00 (CA)	1	WX 900
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		4	
A. M60 indicator		4	
B. E41 antenna		4	
4. OPERATION		4	
STORMSCOPE	34-41-00 (BA)	501	WX 500
ADJUSTMENT / TEST		501	
1. STORMSCOPE OPERATIONAL TEST		501	
A. Tools and consumable materials		501	
B. Procedure		501	
A74 PROCESSOR	34-41-02 (BA)	401	WX 500
REMOVAL / INSTALLATION		401	
1. REMOVAL OF A74 PROCESSOR		401	
A. Tools and consumable material		401	
B. Procedure		401	
2. INSTALLATION OF A74 PROCESSOR		401	
A. Tools and consumable material		401	
B. Procedure		401	
E41 STORMSCOPE ANTENNA	34-41-03 (BA)	201	All WX 1000 - WX 500 series
MAINTENANCE PRACTICES		201	
1. SERVICING		201	
2. REMOVAL / INSTALLATION - E41 STORMSCOPE ANTENNA		201	
A. Tools and consumable materials		201	
B. Removal of E41 stormscope antenna		201	
C. Installation of E41 stormscope antenna		201	
DEPENDENT POSITION DETERMINING	34-50-00 (BA)	1	OPTION
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. DESCRIPTION		1	
A. NAV 1 installation		1	
B. NAV 2 installation		1	
C. Transponder		1	
D. Automatic Direction Finder (ADF)		1	
E. DME installation		1	
F. Global Positioning System (GPS)		1	

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SUBJECT	CHAPTER	PAGE	VALIDITY
DEPENDENT POSITION DETERMINING MAINTENANCE PRACTICES	34-50-00 (BA)	201	OPTION
1. SERVICING		201	
2. REMOVAL / INSTALLATION - RADIONAVIGATION INSTRUMENTS		201	
A. Tools and consumable materials		201	
B. Typical removal procedure of a radionavigation instrument		201	
C. Typical installation procedure of a radionavigation instrument		201	
NAV 1 INSTALLATION	34-51-00 (BI)	1	KNS 81
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		3	
3. OPERATION		3	
NAV 1 INSTALLATION	34-51-00 (BQ)	1	KNS 80
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		3	
3. OPERATION		3	
NAV 1 INSTALLATION	34-51-00 (CU)	1	KX 165 without EFIS
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		4	
3. OPERATION		4	
NAV 1 INSTALLATION	34-51-00 (DA)	1	KX 155 without audio control box
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	
NAV 1 INSTALLATION	34-51-00 (DE)	1	KX 155 - KX 155A with audio control box
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		2	
3. DESCRIPTION		2	
A. A51 VHF NAV/COMM. transceiver		2	
B. E33 VOR/LOC antenna		6	
C. E34 GS antenna		6	
D. A59 VOR signal separator (option)		6	
E. A60 GS signal separator (option)		6	

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SUBJECT	CHAPTER	PAGE	VALIDITY
NAV 1 INSTALLATION (Continued)	34-51-00 (DE)		
F. Course deviation indicator (option)		6	
G. A95 VOR/LOC converter (option)		8	
4. OPERATION		8	
A. VOR/LOC mode		8	
B. Glide slope mode (option)		8	
NAV 1 INSTALLATION	34-51-00 (DI)	1	GNS 430
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		2	
3. DESCRIPTION		2	
A. A78 COMM./VOR-ILS/GPS transceiver		2	
B. E33 VOR/LOC antenna		5	
C. E34 GS antenna		5	
D. A59 VOR signal separator (option)		5	
E. A60 GS signal separator (option)		5	
F. M81 course deviation indicator		5	
4. OPERATION		8	
A. VOR mode		8	
B. ILS mode		8	
C. Coupling to the autopilot system (option)		8	
D. Coupling to the Distance Measuring Equipment (DME) (option)		8	
E. Coupling to the Radio Magnetic Indicator (option)		8	
NAV 1 INSTALLATION	34-51-00 (DM)	1	KN 53
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		4	
3. OPERATION		4	
NAV 1 INSTALLATION	34-51-00 (DQ)	1	Standard
DESCRIPTION AND OPERATION		1	Post-MOD. 151
1. GENERAL		1	
2. LOCATION		1	
NAV 1 INSTALLATION	34-51-00 (DU)	1	GNS 530
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		2	
3. DESCRIPTION		2	
A. A78 COMM./VOR-ILS/GPS transceiver		2	
B. E33 VOR/LOC antenna		5	
C. E34 GS antenna		5	
D. A59 VOR signal separator (option)		5	
E. A60 GS signal separator (option)		5	

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SUBJECT	CHAPTER	PAGE	VALIDITY
NAV 1 INSTALLATION (Continued)	34-51-00 (DU)		
4. OPERATION		7	
A. VOR mode		7	
B. ILS mode		7	
C. Coupling to the autopilot system (option)		7	
D. Coupling to the Distance Measuring Equipment (DME) (option)		7	
E. Coupling to the Radio Magnetic Indicator (option)		7	
F. Coupling to the WX500-series stormscope system (option)		7	
 NAV 2 INSTALLATION	 34-52-00 (BQ)	 1	 KX 165 without EFIS
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	
 NAV 2 INSTALLATION	 34-52-00 (BU)	 1	 GNS 430
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		3	
A. A77 COMM./VOR-ILS/GPS transceiver		3	
B. M74 course deviation indicator		3	
4. OPERATION		6	
A. VOR mode		6	
B. ILS mode		6	
 NAV 2 INSTALLATION	 34-52-00 (CE)	 1	 KX 155 / KX 155A
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		5	
A. A52 VHF NAV/COMM. transceiver		5	
B. M74 course deviation indicator		5	
4. OPERATION		7	
A. VOR/LOC mode		7	
B. Glide Slope mode (option)		7	
 NAV 2 INSTALLATION	 34-52-00 (DA)	 1	 KN 53
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	

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SUBJECT	CHAPTER	PAGE	VALIDITY
TRANSPONDER	34-53-00 (BI)	1	KT 76A
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	
TRANSPONDER	34-53-00 (BM)	1	KT 76C
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		1	
A. A56 transponder		1	
B. E36 transponder antenna		4	
4. OPERATION		4	
TRANSPONDER	34-53-00 (BQ)	1	GTX 320
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		1	
A. A56 transponder		1	
B. E36 transponder antenna		3	
4. OPERATION		3	
TRANSPONDER	34-53-00 (BU)	1	GTX 327
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		1	
A. A56 transponder		1	
B. E36 transponder antenna		2	
4. OPERATION		4	
TRANSPONDER	34-53-00 (CE)	1	KT 71
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	
TRANSPONDER	34-53-00 (CI)	1	GTX 330
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	

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SUBJECT	CHAPTER	PAGE	VALIDITY
TRANSPONDER (Continued)	34-53-00 (CI)		
3. DESCRIPTION		1	
A. A56 transponder		1	
B. E36 transponder antenna		2	
4. OPERATION		4	
TRANSPONDER	34-53-00 (BA)	501	GTX 327
ADJUSTMENT / TEST		501	
1. CONFIGURATION OF THE TRANSPONDER		501	
A. Tools and consumable materials		501	
B. Procedure		501	
TRANSPONDER	34-53-00 (BE)	501	GTX 330
ADJUSTMENT / TEST		501	
1. CONFIGURATION OF THE TRANSPONDER		501	
A. Tools and consumable materials		501	
B. Procedure		501	
E36 TRANSPONDER ANTENNA	34-53-03 (BA)	201	OPTION
MAINTENANCE PRACTICES		201	
1. SERVICING		201	
2. REMOVAL / INSTALLATION - E36 TRANSPONDER ANTENNA		201	
A. Tools and consumable materials		201	
B. Removal of the transponder antenna		201	
C. Installation of the transponder antenna		201	
AUTOMATIC DIRECTION FINDER (ADF)	34-54-00 (BU)	1	KR 87 / KR 87 SC+ with RMI
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		6	
A. A55 ADF receiver		6	
B. E35 ADF antenna		7	
4. OPERATION		7	
A. "ANT" (antenna) mode		7	
B. "ADF" mode		7	
AUTOMATIC DIRECTION FINDER (ADF)	34-54-00 (CA)	1	KR 87 - KR 87 SC+/ KI 227-01
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		6	
A. A55 ADF receiver		6	
B. E35 ADF antenna		7	
C. M77 ADF indicator		7	

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SUBJECT	CHAPTER	PAGE	VALIDITY
AUTOMATIC DIRECTION FINDER (ADF) (Continued)	34-54-00 (CA)		
4. OPERATION		7	
A. "ANT" (antenna) mode		7	
B. "ADF" mode		8	
AUTOMATIC DIRECTION FINDER (ADF) DESCRIPTION AND OPERATION	34-54-00 (CE)	1	KR 87 - KR 87 SC+/ KI 227
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		7	
A. A55 ADF receiver		7	
B. E35 ADF antenna		8	
C. M77 ADF indicator		8	
4. OPERATION		8	
A. "ANT" (antenna) mode		8	
B. "ADF" mode		9	
AUTOMATIC DIRECTION FINDER (ADF) DESCRIPTION AND OPERATION	34-54-00 (CI)	1	KR 87 - ADF 1 + 2
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		4	
A. A55 / A58 ADF receiver		4	
B. E35 / E15 ADF antenna		5	
4. OPERATION		5	
AUTOMATIC DIRECTION FINDER (ADF) ADJUSTMENT / TEST	34-54-00 (BA)	501	KR 87 - KR 87 SC+
1. OPERATIONAL TEST OF AUTOMATIC DIRECTION FINDER (ADF)		501	
A. Tools and consumable materials		501	
B. Procedure		501	
E35 / E15 ADF ANTENNA MAINTENANCE PRACTICES	34-54-05 (BA)	201	KR 87
1. SERVICING		201	
2. REMOVAL / INSTALLATION - ADF ANTENNA		201	
A. Tools and consumable materials		201	
B. Removal of ADF antenna		201	
C. Installation of ADF antenna		201	
DME INSTALLATION	34-55-00 (BI)	1	KN 63 / KDI 572
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	

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SUBJECT	CHAPTER	PAGE	VALIDITY
DME INSTALLATION	34-55-00 (CE)	1	KN 62A - KN 62A SC+/ KN 64A - KN 64A SC+
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		1	
A. A72 DME interrogator		1	
B. E37 DME antenna		2	
4. OPERATION		2	
A. DME interrogator in remote "RMT" mode		2	
B. DME interrogator in frequency "FREQ" mode		2	
C. DME interrogator in groundspeed/time-to-station "GS/T" mode		2	
 E37 DME ANTENNA	 34-55-03 (BA)	 201	 OPTION
MAINTENANCE PRACTICES		201	
1. SERVICING		201	
2. REMOVAL / INSTALLATION - E37 DME ANTENNA		201	
A. Tools and consumable materials		201	
B. Removal of E37 DME antenna		201	
C. Installation of E37 DME antenna		202	
 GLOBAL POSITIONING SYSTEM (GPS)	 34-57-00 (BE)	 1	 KLN 90 Stand alone
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		3	
3. OPERATION		3	
 GLOBAL POSITIONING SYSTEM (GPS)	 34-57-00 (BI)	 1	 KLN 90A with HSI NAV 1 / GPS switching
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		3	
3. OPERATION		3	
 GLOBAL POSITIONING SYSTEM (GPS)	 34-57-00 (CI)	 1	 GARMIN 100 Stand alone
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	
 GLOBAL POSITIONING SYSTEM (GPS)	 34-57-00 (CM)	 1	 GARMIN 100 with HSI NAV 1 / GPS switching
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	

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SUBJECT	CHAPTER	PAGE	VALIDITY
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (CQ)	1	GARMIN 150
DESCRIPTION AND OPERATION		1	Stand alone
1. GENERAL		1	
2. LOCATION		1	
3. OPERATION		1	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (DE)	1	KLN 90B with HSI
DESCRIPTION AND OPERATION		1	NAV 1 / GPS switching
1. GENERAL		1	
2. LOCATION		3	
3. OPERATION		3	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (DI)	1	GPS 1 - GNS 530
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		2	
3. DESCRIPTION		2	
A. A78 COMM./VOR-ILS/GPS transceiver		2	
B. E48 GPS antenna		5	
C. K81 relay		6	
4. OPERATION		6	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (DQ)	1	GPS 1 - GNS 430
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		3	
A. A78 COMM./VOR-ILS/GPS transceiver		3	
B. E48 GPS antenna		5	
4. OPERATION		5	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (DU)	1	GPS 2 - GNS 430
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		3	
A. A77 COMM./VOR-ILS/GPS transceiver		3	
B. E49 GPS antenna		5	
4. OPERATION		5	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (EA)	1	KLN 89B Stand alone
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		3	
3. OPERATION		3	

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SUBJECT	CHAPTER	PAGE	VALIDITY
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (EE)	1	KLN 89B with HSI
DESCRIPTION AND OPERATION		1	NAV 1 / GPS switching
1. GENERAL		1	
2. LOCATION		3	
3. OPERATION		3	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (EI)	1	KLN 94
DESCRIPTION AND OPERATION		1	Stand alone or
1. GENERAL		1	Interfaced with HSI
2. LOCATION		1	
3. DESCRIPTION		3	
A. A78 GPS receiver		3	
B. E48 GPS antenna		5	
C. A92, A93 relay boxes (option)		5	
D. Configuration module		5	
4. OPERATION		5	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (BA)	501	GNS 430
ADJUSTMENT / TEST		501	
1. OPERATIONAL TEST OF THE GLOBAL POSITIONING SYSTEM		501	
A. Tools and consumable material		501	
B. Procedure		501	
2. CONFIGURATION OF THE GLOBAL POSITIONING SYSTEM		502	
A. Tools and consumable material		502	
B. Procedure		502	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (BE)	501	KLN 94
ADJUSTMENT / TEST		501	Stand alone or
1. OPERATIONAL TEST OF THE GLOBAL POSITIONING SYSTEM		501	Interfaced with HSI
A. Tools and consumable material		501	
B. Procedure		501	
2. CONFIGURATION OF THE GLOBAL POSITIONING SYSTEM		502	
A. Tools and consumable material		502	
B. Procedure		502	
GLOBAL POSITIONING SYSTEM (GPS)	34-57-00 (BI)	501	GNS 530
ADJUSTMENT / TEST		501	
1. OPERATIONAL TEST OF THE GLOBAL POSITIONING SYSTEM		501	
A. Tools and consumable material		501	
B. Procedure		501	
2. CONFIGURATION OF THE GLOBAL POSITIONING SYSTEM		503	
A. Tools and consumable material		503	
B. Procedure		503	

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SUBJECT	CHAPTER	PAGE	VALIDITY
E48 GPS ANTENNA	34-57-02 (BA)	201	All KLN 89/90/94
MAINTENANCE PRACTICES		201	
1. SERVICING		201	
2. REMOVAL / INSTALLATION - GPS ANTENNA		201	
A. Tools and consumable materials		201	
B. Removal of GPS antenna		201	
C. Installation of GPS antenna		201	
E48 GPS ANTENNA	34-57-02 (BE)	201	GARMIN 100 / 150
MAINTENANCE PRACTICES		201	
1. SERVICING		201	
2. REMOVAL / INSTALLATION - GPS ANTENNA		201	
A. Tools and consumable materials		201	
B. Removal of GPS antenna		201	
C. Installation of GPS antenna		201	
E48 / E49 GPS ANTENNA	34-57-02 (BI)	201	GA 56
MAINTENANCE PRACTICES		201	Post-MOD. 151
1. SERVICING		201	
2. REMOVAL / INSTALLATION - GPS ANTENNA		201	
A. Tools and consumable materials		201	
B. Removal of GPS antenna		201	
C. Installation of GPS antenna		201	
E023 / E92 / E93 RELAY BOX	34-57-05 (BA)	201	GPS with HSI
MAINTENANCE PRACTICES		201	
1. SERVICING		201	
2. REMOVAL / INSTALLATION - RELAY BOX		201	
A. Tools and consumable materials		201	
B. Removal of the relay box		201	
C. Installation of the relay box		201	
FLIGHT MANAGEMENT COMPUTING	34-60-00 (BA)	1	S/N 1 - 9999
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. DESCRIPTION		1	
A. Multifunction display		1	
MULTIFUNCTION DISPLAY	34-62-00 (BE)	1	KMD 550
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
2. LOCATION		1	
3. DESCRIPTION		1	
A. M63 multifunction display		1	

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SUBJECT	CHAPTER	PAGE	VALIDITY
MULTIFUNCTION DISPLAY (Continued)	34-62-00 (BE)		
4. OPERATION		4	
A. MAP mode		4	
B. WX mode		4	
C. AUX mode		4	
D. TRFC and TERR modes		4	
 MULTIFUNCTION DISPLAY	 34-62-00 (BE)	 501	 KMD 550
ADJUSTMENT / TEST		501	
1. OPERATIONAL TEST OF THE MULTIFUNCTION DISPLAY		501	
A. Tools and consumable materials		501	
B. Procedure		501	
2. CONFIGURATION OF MULTIFUNCTION DISPLAY/STORMSCOPE		502	
A. Tools and consumable materials		502	
B. Procedure		502	
3. CONFIGURATION OF MULTIFUNCTION DISPLAY		503	
A. Tools and consumable materials		503	
B. Procedure		503	

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NAVIGATION

DESCRIPTION AND OPERATION

1. GENERAL

This chapter describes the systems which provide information for navigation purposes.

It includes :

- the flight environment data,
- the attitude and direction,
- the landing and taxiing aids (option),
- the independent position determining (option),
- the dependent position determining (option),
- the flight management computing (option).

2. DESCRIPTION

A. Flight environment data - refer to 34-10-00

This installation senses the environmental conditions and uses the corresponding data for navigation. These data depend mainly on the static and dynamic information.

B. Attitude and direction systems - refer to 34-20-00

This installation uses the magnetic or gyroscopic forces. It also includes :

- the optional Electronic Flight Instrumentation System,
- the optional radio magnetic indication system.

C. Landing and taxiing aids - refer to 34-30-00

This section deals with the MARKER system which ensures the guiding during the approach.

D. Independent position determining systems - refer to 34-40-00

This section deals with the stormscope.

E. Dependent position determining systems - refer to 34-50-00

This section includes the "VOR", "DME", "ADF", transponder and "GPS" systems.

F. Flight management computing - refer to 34-60-00

This section deals with the systems which combine navigation data to compute or manage the aircraft geographical position.

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**FLIGHT ENVIRONMENT DATA
DESCRIPTION AND OPERATION**

1. GENERAL

This section describes the systems or instruments which sense the environmental conditions.

The installation is composed of :

- the air data systems,
- the outside air temperature system.

2. DESCRIPTION

A. Air data systems - refer to 34-11-00

This section describes the instruments which operate using static and / or dynamic data.

B. Outside air temperature - refer to 34-13-00

This system indicates the outside air temperature.

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AIR DATA SYSTEMS

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1 and 1A)

The air data chapter deals with the ambient air pressure systems and the instruments operating with the static and dynamic pressures.

The system is composed of :

- an airspeed or true airspeed indicator No. 1,
- an additional airspeed or true airspeed indicator No. 2 (option),

Option Pre-MOD. 151, Standard Post-MOD. 151

- a vertical speed indicator No. 1,

All

- an additional vertical speed indicator No. 2 (option),
- an altimeter No. 1,
- or an altimeter No. 1 with an altitude reporter (option),
- or an encoding altimeter (option),
- an additional altimeter No. 2 (option),
- an additional altimeter No. 3 (option),

Pre-MOD. 151

- a pitot tube,
- or a heated pitot tube (option),

Post-MOD. 151

- a heated pitot tube,

All

- an additional heated pitot tube No. 2 (option),

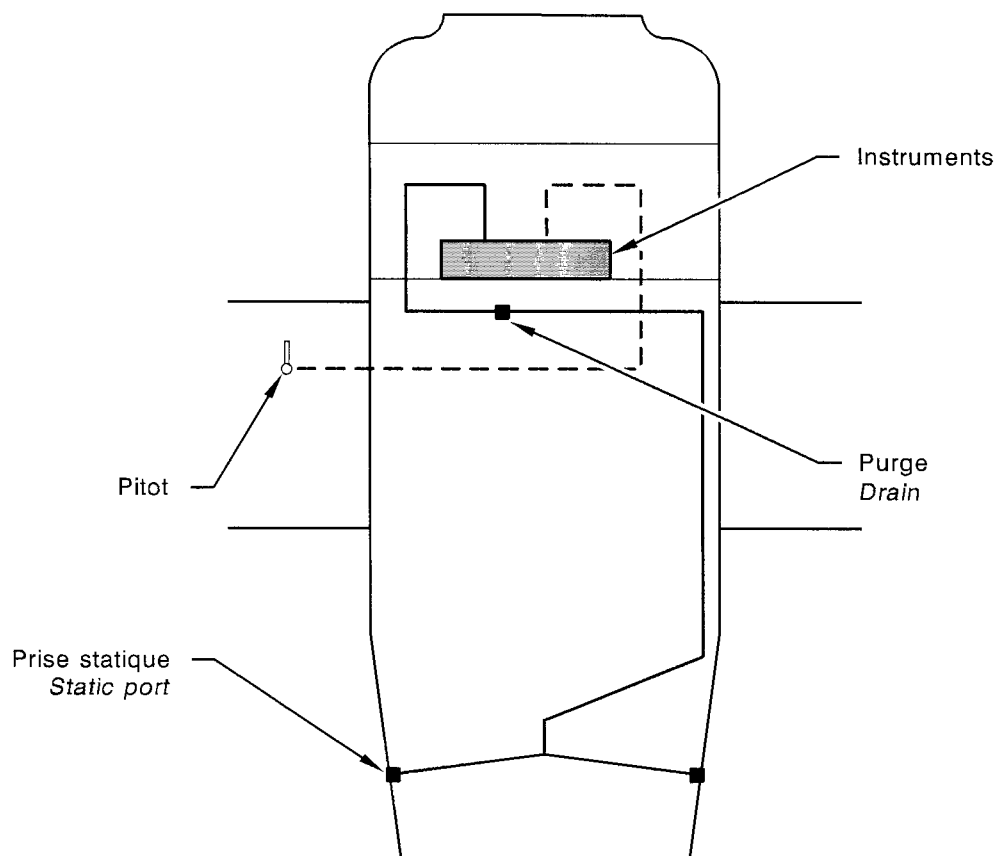
■ For the description of the pitot heating system, refer to 30-30-00.

Option Pre-MOD. 151, Standard Post-MOD. 151

- an alternate static source valve.

The installation uses an air data system composed of a static pressure system and a total (dynamic) pressure system.

The two static ports are located on the L.H. and R.H. sides of aft fuselage.



LEGENDE :
LEGEND :
----- Circuit dynamique
Dynamic system
————— Circuit statique
Static system

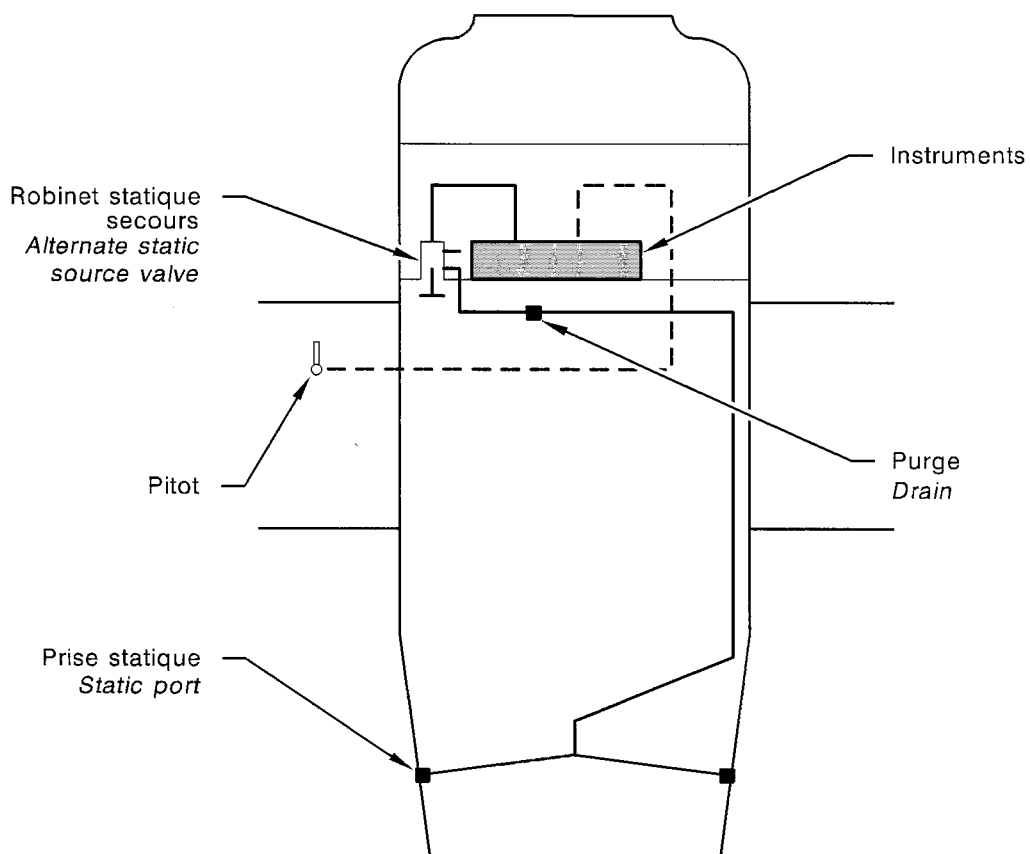
I4341100AABGWZ4100

Air data systems - Schematic
Figure 1 - Standard Pre-MOD. 151

ADAB

Validity : S / N 823 - 849, 888, 948 - 9999

34-11-00 (CE) Page 2
NOV 01



LEGENDE :
LEGEND :

----- Circuit dynamique
Dynamic system
————— Circuit statique
Static system

14341100AABGWZ4200

Air data systems - Schematic
Figure 1A - Option Pre-MOD. 151, Standard Post-MOD. 151

ADAB

Validity : S / N 823 - 849, 888, 948 - 9999

34-11-00 (CE)

Page 3
NOV 01

2. LOCATION (Figures 2, 3, 4 and 5)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Airspeed or true airspeed indicator No. 1	1	251L	/	34-11-00
Airspeed or true airspeed indicator No. 2 (option)	1	251R	/	34-11-00
Vertical speed indicator No. 1	1	251L	/	34-11-00
Vertical speed indicator No. 2 (option)	1	251R	/	34-11-00
Altimeter No. 1 or encoding altimeter (option)	1	251L	/	34-11-00
Altitude reporter (option)	1	230	211R	/
Altimeter No. 2 (option)	1	251R	/	34-11-00
Altimeter No. 3 (option)	1	251L or 254L	/	34-11-00
Pitot tube or heated pitot tube	1	510	/	34-11-08
Heated pitot tube No. 2 (option)	1	610	/	/
Alternate static source valve	1	250	/	/
Fuse : - "ALT. ENCODER"	1	/	/	WM

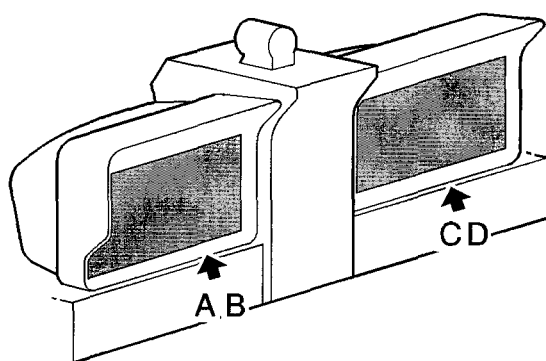
3. DESCRIPTION

A. True airspeed indicator

The true airspeed indicator indicates the relative speed of the aircraft compared with the air. The true airspeed indicator includes in its forward face :

- a knob located in the R.H. lower corner which allows adjusting the barometric correction,
- a window located in the dial upper part which visualizes an altitude / temperature correction scale,
- a window located in the dial L.H. lower quarter which includes a movable reading scale, moving according to the displayed barometric correction.

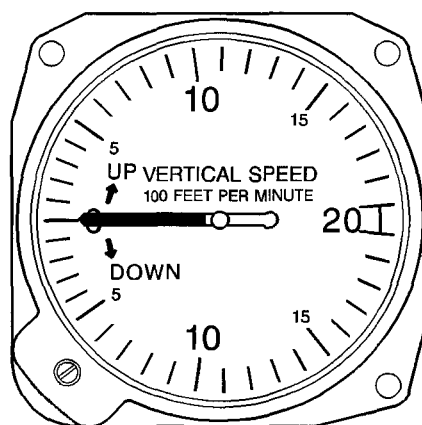
The true airspeed indicator measures the difference between the dynamic pressure and the static pressure and sets this difference out as a relative speed. The adjustment knob performs the barometric correction within a determined speed range.



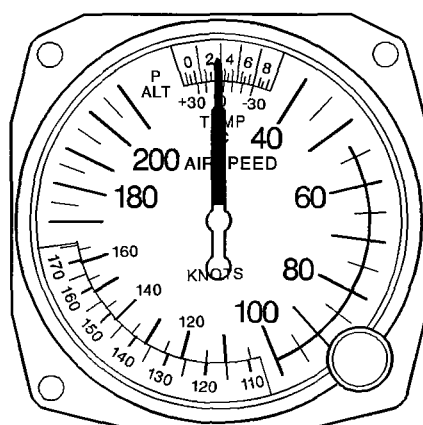
- A - Vertical speed indicator No. 1
- B - True airspeed indicator No. 1
- C - Vertical speed indicator No. 2 (option)
- D - True airspeed indicator No. 2 (option)

 Variante de localisation
Alternate location

(A) (C)



(B) (D)



14341100AAAXVZ4101

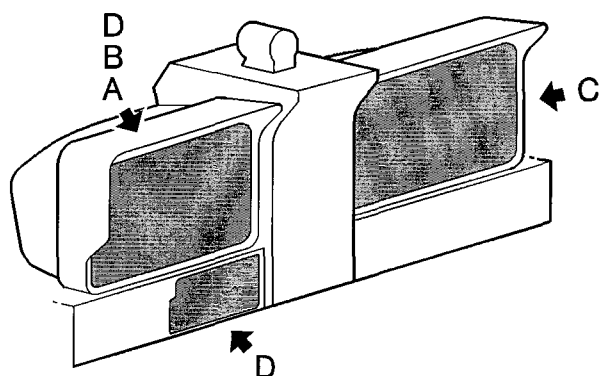
Air data systems - Identification and location of components
Figure 2

ADAB

Validity : S / N 823 - 849, 888, 948 - 9999

34-11-00 (CE)

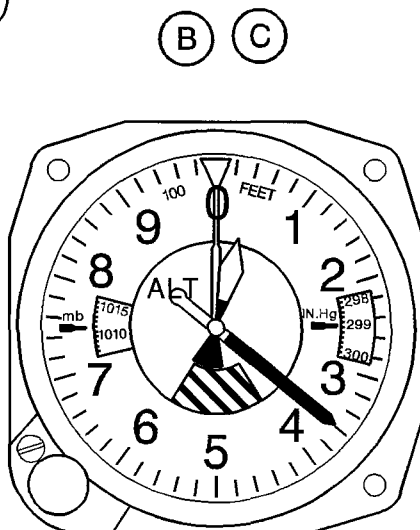
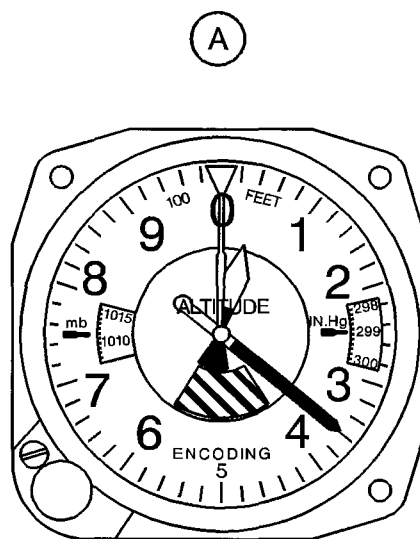
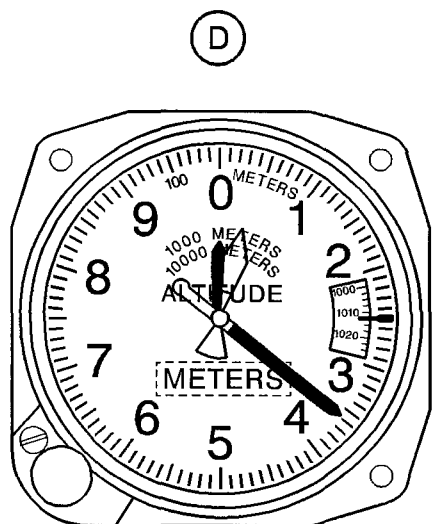
Page 5
NOV 01



- A - Encoding altimeter (option)
- B - Altimeter No. 1
- C - Altimeter No. 2 (option)
- D - Altimeter No. 3 (option)



Variante de localisation
Alternate location



Air data systems - Identification and location of components
Figure 3

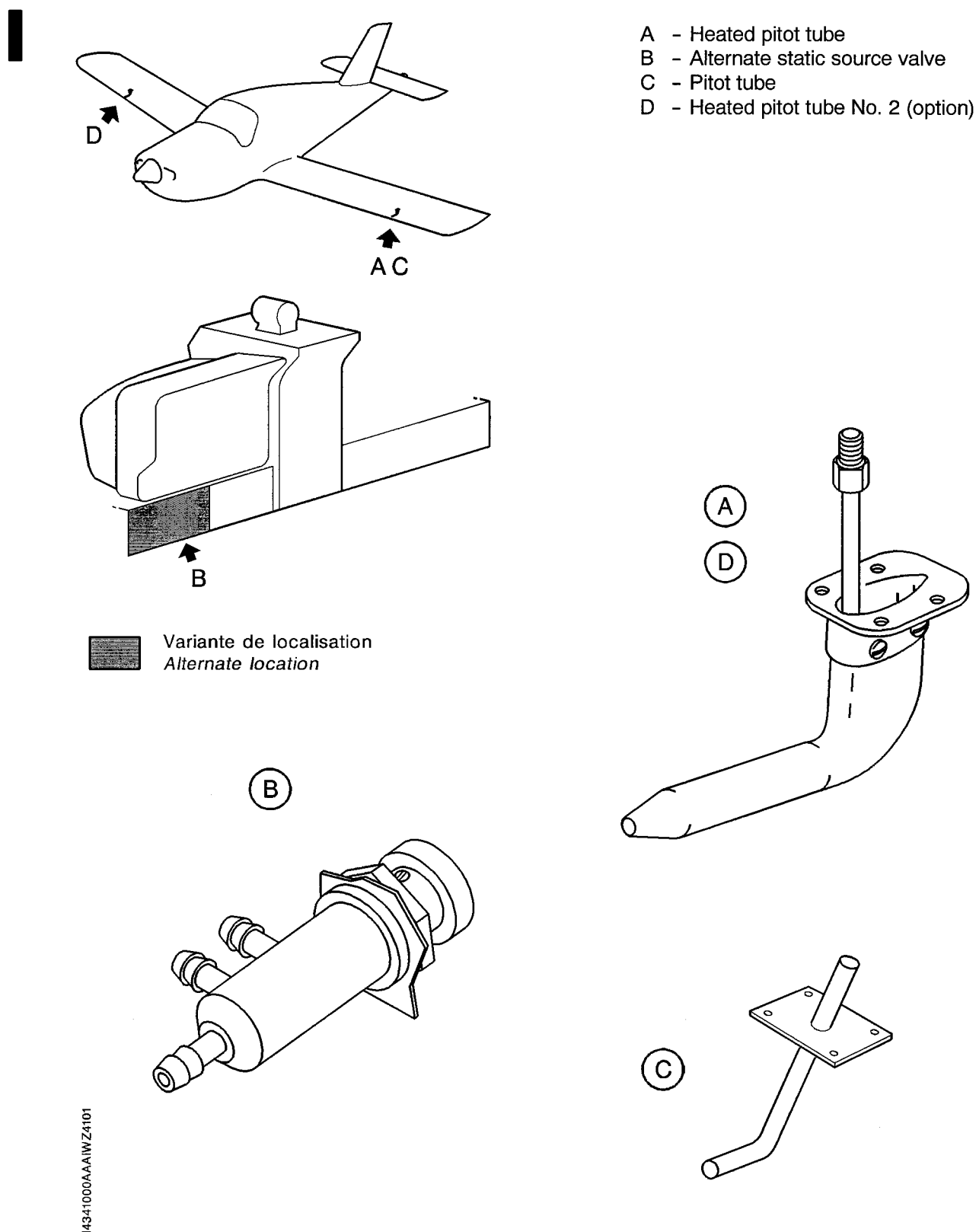
14342000AAAAZY14001

ADAB

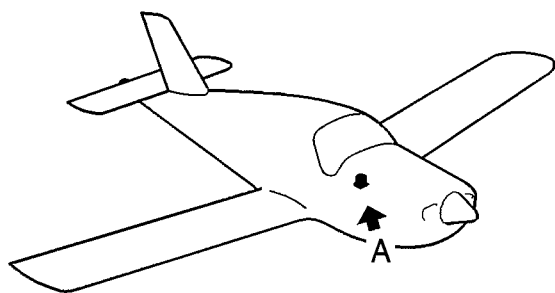
Validity : S / N 823 - 849, 888, 948 - 9999

34-11-00 (CE)

Page 6
FEB 00

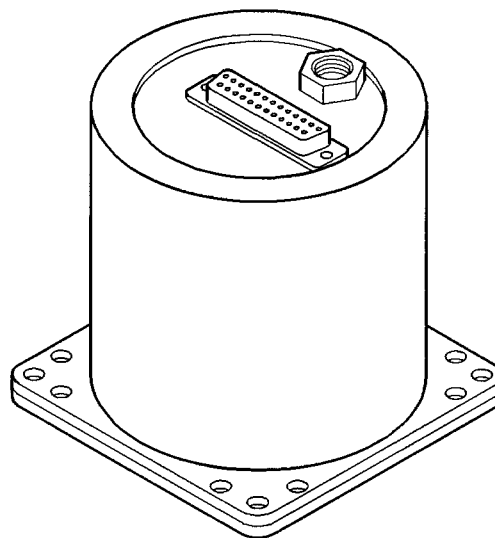
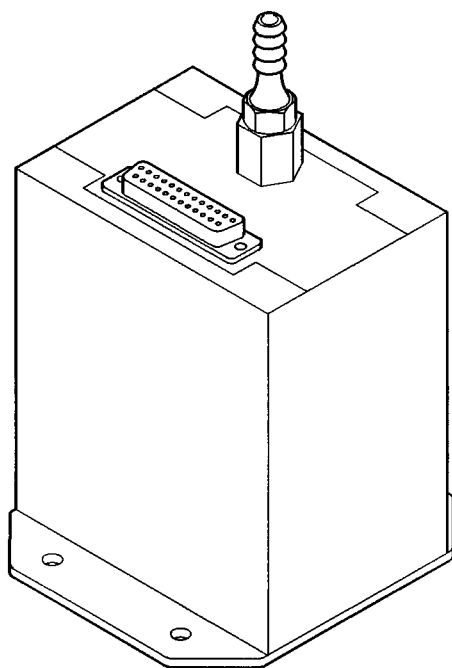


Air data systems - Identification and location of components
Figure 4



A - Altitude reporter (option)

A



I4341100AABHWZ4000

Air data systems - Identification and location of components
Figure 5

ADAB

Validity : S / N 823 - 849, 888, 948 - 9999

34-11-00 (CE)

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FEB 00

B. Vertical speed indicator (Option Pre-MOD. 151, Standard Post-MOD. 151)

The vertical speed indicator indicates the climb or descent vertical speed.

It has a dial gauge graduated from 0 to ± 2000 ft / min. On the forward face, in the L.H. lower corner, a screw allows adjusting the zero position of the needle.

The vertical speed indicator consists of a sealed box producing a capacity. This capacity communicates with the static pressure through a calibrated hole. The vertical speed indicator measures the pressure difference between the static pressure and the pressure in the capacity.

C. No. 1 / No. 2 altimeter

The altimeter indicates the aircraft altitude with respect to a reference pressure (ground, Mean Sea Level).

The altimeter is a classic altimeter graduated in feet ($- 1000$ to $+ 20000$ or $+ 35000$). The indicating is ensured by three concentric pointers.

The barometric pressure setting knob allows setting the reference atmospheric pressure used for the setting of the altimeter. This pressure is indicated in inches of mercury and in millibars.

A resetting device is provided to make the altitude scale and the pressure scale coincide. A screw located near the barometric pressure setting knob allows unlocking the resetting device.

The operation principle of the altimeter is based on an aneroid diaphragm which expands and contracts as a function of the pressure variations transmitted by the aircraft static system.

D. Altitude reporter (option)

The altitude reporter converts pressure / altitude information into digitized altitude data. It sends altitude data to aircraft's transponder.

Several different models of altitude reporter equipment are available for installation in the aircraft.

The altitude reporter is located on R.H. FWD table close to the firewall.

The altitude reporter is electrically supplied by "BUS 1" bar and protected by "ALT. ENCODER" fuse. The fuse is located in the fuse panel secured on the firewall (Frame C0).

E. Encoding altimeter (option)

The encoding altimeter indicates the altitude of the aircraft with respect to a reference pressure (ground, Mean Sea Level).

The encoding altimeter ensures the following functions :

- indication of the aircraft altitude ($- 1000$ to $+ 20000$ or $+ 35000$ feet),
- coding of altitude-related data used by the transponder.

The altitude is indicated by means of three pointers on a dial graduated in feet.

The barometric pressure resetting knob allows entering the reference atmospheric pressure used for the setting of the altimeter. This pressure is indicated in millibars and in inches of mercury in two different windows.

A resetting device is provided to make the altitude scale and the pressure scale coincide. A screw located near the barometric pressure setting knob allows unlocking the resetting device.

The encoding altimeter is electrically supplied by "BUS 1" bus bar via the "ALT. ENCODER" fuse. The fuse is located in the fuse panel secured on the firewall (Frame C0).

F. No. 3 altimeter (option)

The altimeter indicates the aircraft altitude with respect to a reference pressure (ground, Mean Sea Level).

The altimeter is a classic altimeter graduated in meters (- 300 to 10668). The indicating is ensured by three concentric pointers.

The barometric pressure setting knob allows setting the reference atmospheric pressure used for the setting of the altimeter. This pressure is indicated in millibars.

A resetting device is provided to make the altitude scale and the pressure scale coincide. A screw located near the barometric pressure setting knob allows unlocking the resetting device.

The operation principle of the altimeter is based on an aneroid diaphragm which expands and contracts as a function of the pressure variations transmitted by the aircraft static system.

G. Pitot tube

Pre-MOD. 151

The pitot tube supplies the dynamic pressure, through lines, to the aircraft systems. It can be replaced by an optional heated pitot tube.

Post-MOD. 151

The heated pitot tube supplies the dynamic pressure, through lines, to the aircraft systems.

H. Alternate static source valve (Option Pre-MOD. 151, Standard Post-MOD. 151)

A two-position selector allows the normal static source system of the aircraft to be isolated in case of clogging or icing of the static ports.

The "EMERGENCY" position of the alternate static source valve admits cabin static pressure to the static system.

4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

The static system is provided with a draining point which allows eliminating condensation water accumulated into the lines.

Aircraft with alternate static source valve

The system is in normal operation mode when the control button of the alternate static source valve is depressed.

All

The pressure from the static pressure ports is directly or via the alternate static source valve conveyed to :

- the airspeed or true airspeed indicator, the altimeter or the optional encoding altimeter and the vertical speed indicator (optional) of the L.H. instrument panel,
- the optional instruments of the R.H. instrument panel that require static pressure,
- the optional altitude reporter,
- the flight computer (if required) of the optional autopilot system.

Aircraft with alternate static source valve

The system is in emergency operation mode when the control button of the alternate static source valve is pulled.

In this mode, the cabin pressure is applied via the alternate static source valve to the instruments requiring static pressure for operation.

All

The dynamic pressure collected by the pitot tube is directly applied to :

- the airspeed or true airspeed indicator of the L.H. instrument panel,
- the airspeed or true airspeed indicator (optional) of the R.H. instrument panel.

If the aircraft is equipped with two heated pitot tubes (optional), the dynamic pressure collected by the L.H. pitot tube is directly applied to the airspeed or true airspeed indicator of the L.H. instrument panel. The dynamic pressure collected by the R.H. pitot tube is applied to the airspeed or true airspeed indicator of the R.H. instrument panel.

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AIR DATA SYSTEMS

SERVICING

CAUTION : DO NOT APPLY PRESSURE INTO STATIC AND DYNAMIC SYSTEMS AS LONG AS ALL AIR DATA INSTRUMENTS AND SYSTEMS ARE NOT DISCONNECTED FROM THE SYSTEM TO BE DRAINED.

NOTE : The static pressure ports should be cleaned periodically, using a clean, lint-free cloth moistened with water mixed with cleaning agent (TB 11-001). Do not use any polishing product which may penetrate the systems and thus cause indicating errors.

1. STATIC SYSTEM DRAINING (Figures 301 and 301A)

A. Tools and consumable materials

- Nitrogen cylinder [maximum pressure 2.20 lbs (1 kg)]
- Clean, lint-free cloths
- Blanking caps and plugs

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Drain the static system:
 - a) Unscrew the drain plug.

NOTE : The bleed is located under the fuselage at level of cowl under hull No. 218 or 218F.

- b) If no water flows, position and screw the drain plug.
- c) If water flows, perform the following operations:
 - 1 Disconnect all static pressure lines that terminate all atmospheric reference instruments and components [altimeter(s), altitude reporter, vertical speed indicator(s), airspeed indicator(s) and A82 flight computer of the autopilot...].
 - 2 Blank off each instrument fitting.

With alternate static source valve

- 3 On the alternate static source valve:

- a disconnect the instrument supply hose (connected to the rear portion of the alternate static source valve),
- b disconnect the hose from static ports.

- 4 Remove the blanking caps from both static ports of the fuselage.

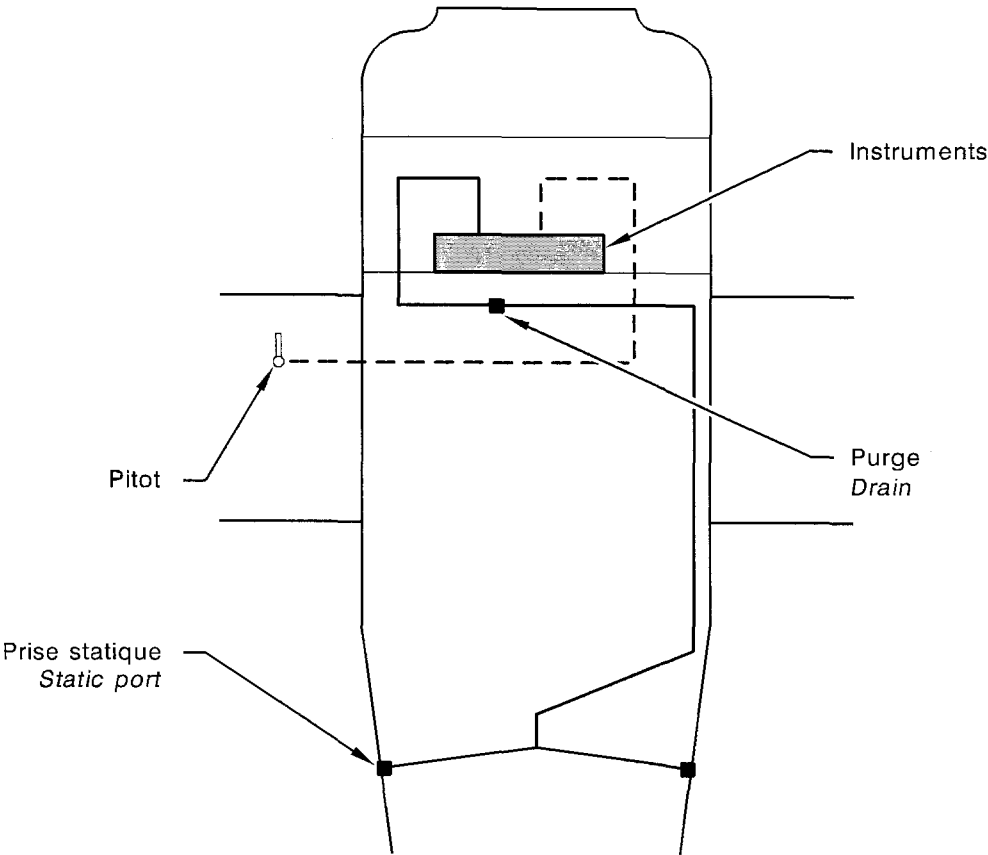
- 5 Simultaneously connect the nitrogen source to both static ports. Ventilate the system.

- 6 Connect the nitrogen source to the hose previously disconnected from the alternate static source valve and coming from static ports. Ventilate the system.

- 7 Successively connect the nitrogen source to the static pressure line that terminates each instrument. Ventilate the system.
- 8 Position and screw drain plug.
- 9 Connect the following components to the alternate static source valve:
 - a the instrument supply hose (aft of the alternate static source valve),
 - b the hose from static ports.
- 10 Remove the blanking caps from each instrument fitting and connect the static pressure lines.
- 11 Blank off both static pressure ports of the fuselage.

Without alternate static source valve

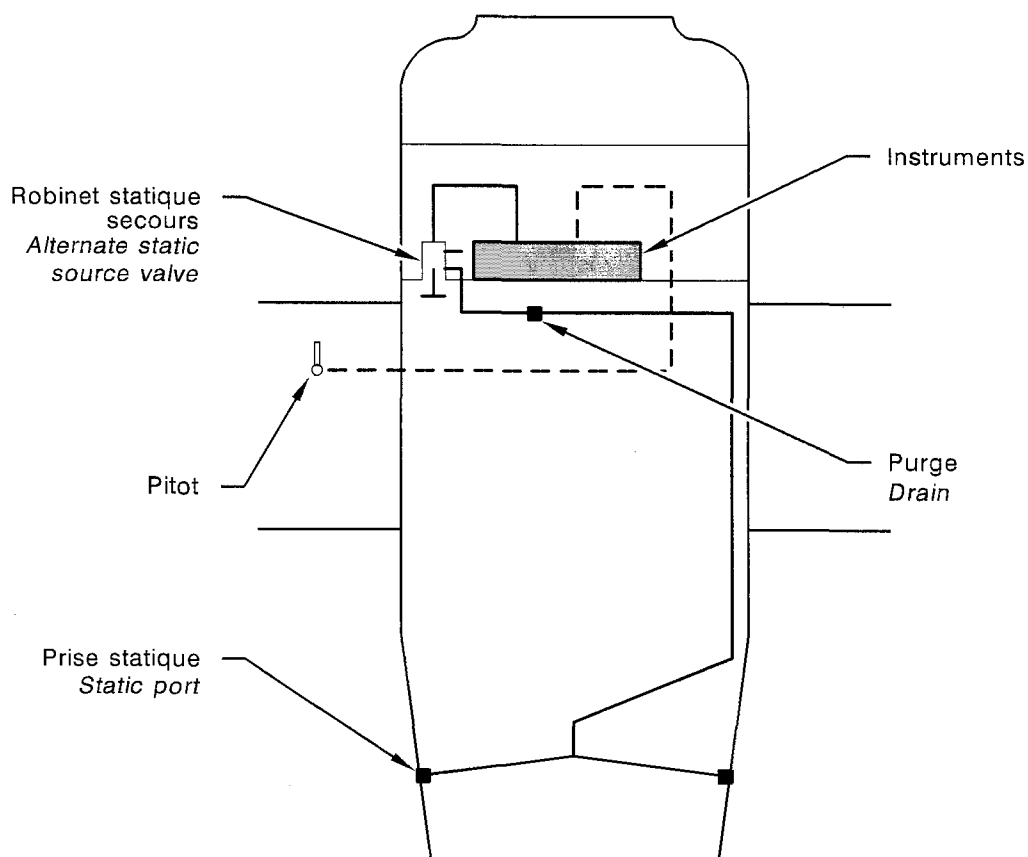
- 3 Remove the blanking caps from both static ports of the fuselage.
 - 4 Simultaneously connect the nitrogen source to both static ports. Ventilate the system.
 - 5 Successively connect the nitrogen source to the static pressure line that terminates each instrument. Ventilate the system.
 - 6 Position and screw drain bleeder.
 - 7 Remove the blanking caps from each instrument fitting and connect the static pressure lines.
 - 8 Blank off both static pressure ports of the fuselage.
- 3) Perform a leakage test of the static system - refer to Page 501.



- LEGENDE :
LEGEND :
- Circuit dynamique
Dynamic system
 - Circuit statique
Static system

Air data systems - Servicing
Figure 301 - Without alternate static source valve

I4341100AABGWZ4100



LEGENDE :
LEGEND :

----- Circuit dynamique
Dynamic system

————— Circuit statique
Static system

Air data systems - Servicing
Figure 301A - With alternate static source valve

AIR DATA SYSTEMS

REMOVAL / INSTALLATION

NOTE : The standard removal / installation procedure of an instrument applies to altimeters, airspeed indicators and vertical speed indicators.

1. STANDARD REMOVAL OF AN INSTRUMENT

A. Tools and consumable materials

- Blanking caps and plugs

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Tilt the instrument panel and remove the upper cover - refer to 31-10-01.
- 3) Disconnect the instrument hose(s).
- 4) If necessary, disconnect the electrical connector(s).
- 5) Remove the instrument.
- 6) If the instrument is to be replaced, remove and retain the attachment captive nuts, the fitting(s) screwed on the instrument and, if necessary, the lighting kit.
- 7) Blank off the aircraft hose(s) and tube(s) and the removed instrument outlets.

2. STANDARD INSTALLATION OF AN INSTRUMENT

A. Tools and consumable materials

- Sealant (TB 09-911)
- Cleaning agent (TB 11-003)
- CLIC pliers Z00.N7675230202 (CAILLAU clamps)

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) If the instrument is replaced, perform the following operations :
 - a) Clean the threads of the fitting(s) with some cleaning agent (TB 11-003).
 - b) Apply some sealant (TB 09-911) moderately and evenly to the threads of the fitting(s).
 - c) Install the fitting(s) on the new instrument.
 - d) Install the attachment captive nuts and, if necessary, the lighting kit.
- 3) Secure the instrument to the instrument panel.
- 4) Remove the blanking caps and plugs, fit the hose(s) with clamps and perform the connections.

NOTE : CAILLAU clamps cannot be reused. Use a CLIC pliers for the installation of new clamps.

- 5) Make sure all the tools and materials are removed and the work area is clean and free from debris.

- 6) Tilt back the instrument panel.
- 7) Position the upper cover and secure the instrument panel - refer to 31-10-01.
- 8) Perform a leakage test of air data systems.

AIR DATA SYSTEMS

ADJUSTMENT / TEST

1. LEAKAGE TEST OF AIR DATA SYSTEMS

CAUTION : VERY LOW PRESSURES ARE USED BY AIR DATA INSTRUMENTS AND SYSTEMS. USE AN APPROPRIATE TEST BENCH TO AVOID INSTRUMENTS AND SYSTEMS DAMAGE. NEVER BLOW AIR FROM MOUTH INTO STATIC PORTS OR PITOT TUBES.

CAUTION : DECREASE PRESSURE DOWN TO AMBIENT ATMOSPHERIC PRESSURE BEFORE DISCONNECTING THE AIR DATA SYSTEM TEST BENCH HOSES FROM THE AIRCRAFT DYNAMIC AND STATIC PORTS.

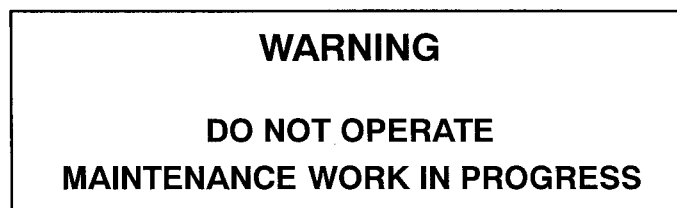
NOTE : The procedure described hereafter gives the outlines of an example of leakage test of dynamic and static systems without reference to a specific test bench.

A. Tools and consumable materials

- Test bench
- Blanking cap
- Adhesive tape

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Install the warning sign prohibiting main switch-breaker operation.



- 3) If necessary, remove the blanking caps from pitot tube(s) and from aircraft static ports.
- 4) Set the control knob of alternate static source valve (if installed) to "in" position.
- 5) Check the static system for leaks :
 - a) Make sure that static ports and bleed are not clogged, that lines are not crushed or bent, then plug the bleed.
 - b) Blank off one of the static ports with a cap or adhesive tape.
 - c) On the aircraft altimeter, adjust altimeter setting to 29.92 in.Hg (1013.24 mb) and record the altitude given by the altimeter.
 - d) Connect the test bench vacuum hose to the free static port.
 - e) Apply negative pressure until the aircraft altimeter displays 1000 ft (304.8 m) above the altitude recorded in step c).
 - f) Shut the supply valve of static hose and, for one minute, make sure that the altitude loss displayed on the altimeter does not exceed 100 ft (30.4 m).

AAAA

Validity : S / N 1 - 9999

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- g) Gradually decrease pressure to ambient atmospheric pressure.
- h) Perform the same procedure on the other static port.
- 6) Check the dynamic system for leaks :
 - a) Make sure that pitot tube of L.H. wing is not clogged and that hose of dynamic system is not crushed or bent.
 - b) Connect the test bench pressure hose to pitot tube.
 - c) Apply pressure until the aircraft airspeed indicator displays a speed of 162 kt (300 km/h).
 - d) Shut the supply valve of dynamic hose and, for one minute, make sure that the speed loss displayed on the aircraft airspeed indicator does not exceed 3 kt (6 km/h).
 - e) If there are no leaks, gradually decrease pressure to ambient atmospheric pressure.

NOTE : To locate any leak (either in instruments or in system) simply disconnect the dynamic system from the airspeed indicator (access by tilting instrument panel) ; perform a test with test bench on the instrument then on the system. For the latter, seal up the pitot tube.

- f) If the aircraft R.H. wing is fitted with a pitot tube, perform the same procedure than for the L.H. wing. In this case, the airspeed indicator located on the R.H. instrument panel is usually related to the R.H. wing pitot tube.

PITOT TUBE

REMOVAL / INSTALLATION

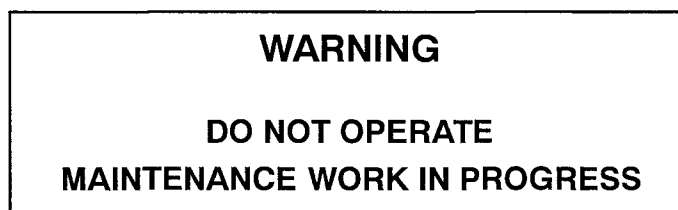
1. REMOVAL OF PITOT TUBE (Figure 401)

A. Tools and consumable materials

- Blanking caps and plugs

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Install the warning sign prohibiting main switch-breaker operation.



- 3) On PL2 central pedestal, make sure heating control switch-breaker of pitot tube (5) is open.
- 4) If necessary, remove the protection cover from the pitot tube.
- 5) Remove access door No. 515.
- 6) Disconnect electrical connector (1).

CAUTION : USING A SPANNER, HOLD TUBE (7) INTEGRAL WITH PITOT TUBE WHEN SCREWING OR UNSCREWING THE ATTACHMENT NUT OF THE DYNAMIC PRESSURE TUBE.

- 7) Unscrew nut (11).
- 8) Remove and retain screws (6), washers (9) and nuts (10). Remove pitot tube (5) and discard the nuts.
- 9) Blank off tube (7) and hose (12).
- 10) Retain reinforcement plate (8).
- 11) If pitot tube is to be replaced, remove and retain screws (2), washers (3) and mounting plate (4).

2. INSTALLATION OF PITOT TUBE (Figure 401)

A. Tools and consumable materials

None

B. Procedure

- 1) Make sure:
 - main switch breaker is open,
 - warning sign prohibiting main switch-breaker operation is posted up,
 - heating control switch-breaker of pitot tube is open.

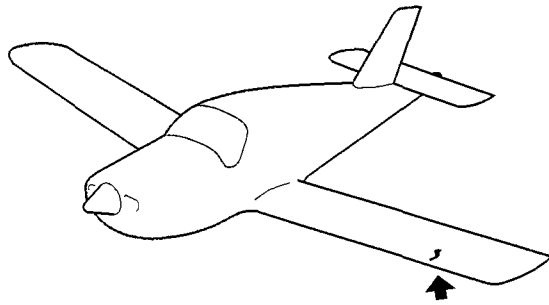
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Validity : Option Pre-MOD. 151,
Standard Post-MOD. 151

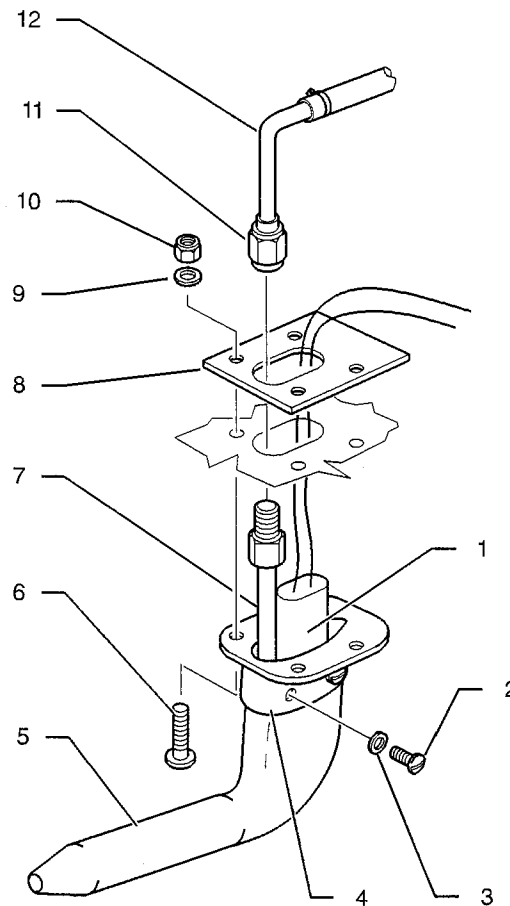
- 2) If necessary, fit pitot tube (5) with its mounting plate (4). Make sure the base is free of cracks. Attach it with screws (2) and washers (3).
- 3) Remove blanking caps and plugs.
- 4) Make sure mounting interfaces are serviceable and clean.
- 5) Position reinforcement plate (8).
- 6) Secure pitot tube (5), fitted with mounting plate (4), with screws (6), washers (9) and new nuts (10).

CAUTION : USING A SPANNER, HOLD TUBE (7) INTEGRAL WITH PITOT TUBE WHEN SCREWING OR UNSCREWING THE ATTACHMENT NUT OF THE DYNAMIC PRESSURE TUBE.

- 7) Connect hose (12) to tube (7). Tighten nut (11).
- 8) Connect electrical connector (1).
- 9) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 10) Install access door No. 515.
- 11) Perform a leakage test of dynamic system - refer to 34-11-00.
- 12) Perform a test of pitot tube heating system - refer to 30-30-00.
- 13) When the pitot tube is cold, put the protection cover on it.



- 1 - Electrical connector
- 2 - Screw
- 3 - Washer
- 4 - Mounting plate
- 5 - Pitot tube
- 6 - Screw
- 7 - Tube
- 8 - Reinforcement plate
- 9 - Washer
- 10 - Nut
- 11 - Nut
- 12 - Hose



Pitot tube - Removal / Installation
Figure 401

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Validity : Option Pre-MOD. 151,
Standard Post-MOD. 151

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Validity : Option Pre-MOD. 151,
Standard Post-MOD. 151

34-11-08_(BA)

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OUTSIDE AIR TEMPERATURE

DESCRIPTION AND OPERATION

1. GENERAL

The outside air temperature system provides the pilot with a digital display of the temperature of the air in which the aircraft is being flown.

The system is composed of :

- a MT35 outside temperature sensor,
- a M15 outside temperature indicator.

The system is electrically supplied by "BUS 1" bar.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
MT35 outside temperature sensor	1	510	/	/
M15 outside temperature indicator	1	250	/	/
Circuit breaker : - CB 26 "OAT"	1	230	232L	WM

3. DESCRIPTION

A. MT35 outside air temperature sensor

The temperature sensor supplies a micro-ampere current for each Kelvin degree.

It consists of a metallic body equipped with a connector ; a protective filter against VHF transmissions can be installed on the wiring.

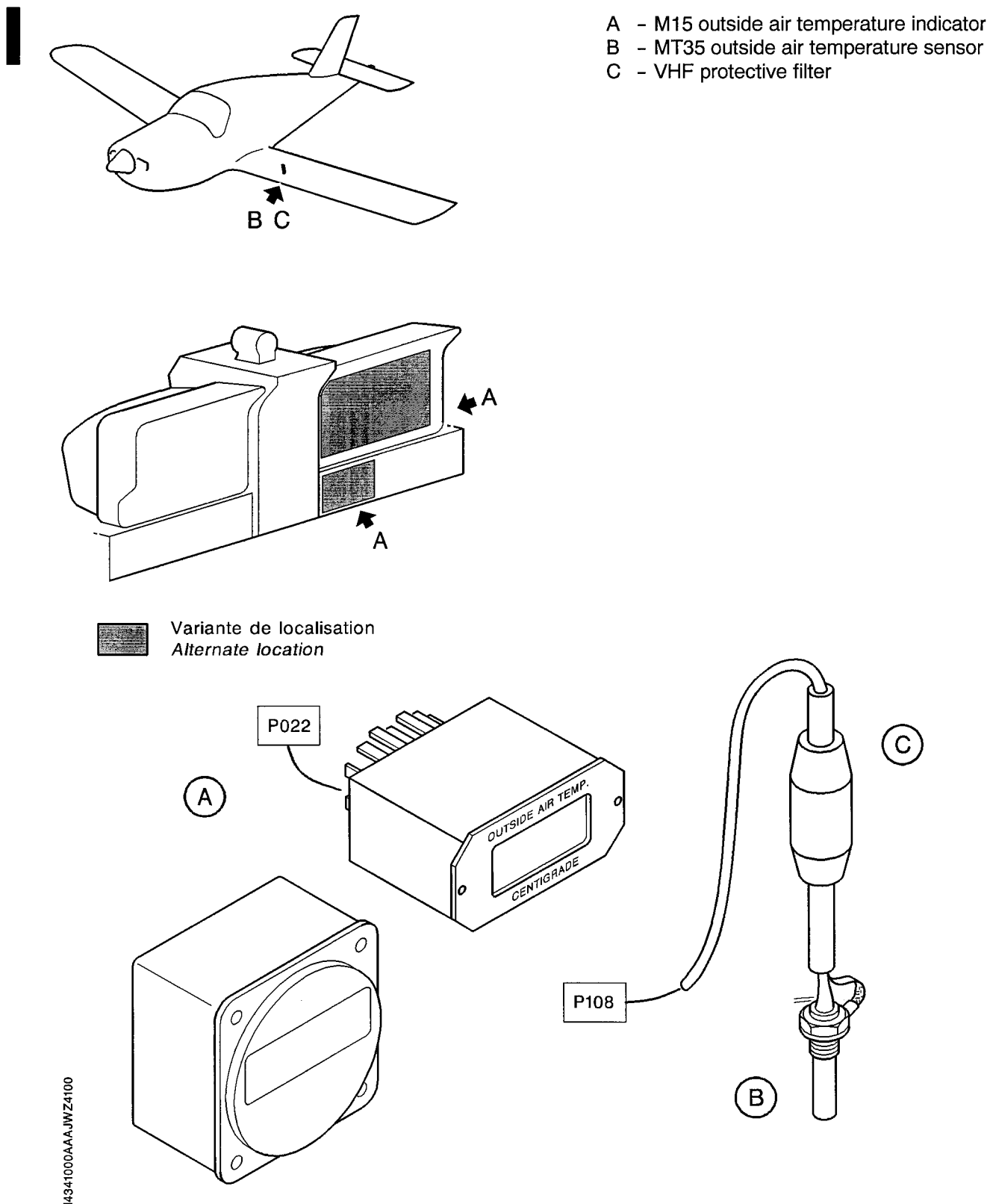
The sensor is located under the L.H. wing.

B. M15 outside air temperature indicator

The digital readout indicator with integrated lighting (dimmed by photo cell) is generally located on the R.H. instrument panel. It receives indications from the sensor. This system is protected by a CB 26 "OAT" circuit breaker located on the circuit breakers panel.

4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



Outside air temperature - Identification and location of components
Figure 1

OUTSIDE AIR TEMPERATURE

DESCRIPTION AND OPERATION

1. GENERAL

The outside air temperature system provides the pilot with a digital display of the temperature of the air in which the aircraft is being flown.

The system is composed of :

- a MT35 outside temperature sensor,
- a M15 outside temperature indicator.

The system is electrically supplied by "BUS 1" bar.

2. LOCATION (Figures 1 and 1A)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
MT35 outside temperature sensor	1	510	/	/
M15 outside temperature indicator	1	250	/	/
Circuit breaker : - CB 26 "OAT"	1	230	232L	WM

3. DESCRIPTION

A. MT35 outside air temperature sensor

The temperature sensor supplies a micro-ampere current for each Kelvin degree.

It consists of a metallic body equipped with a connector. A protective filter against VHF transmissions can be installed on the wiring according to the type of indicator interfaced with the sensor.

The sensor is located under the L.H. wing.

B. M15 outside air temperature indicator

Aircraft with DAVTRON MC 377C indicator

The digital readout indicator with integrated lighting (dimmed by photo cell) is located on the R.H. instrument panel. It receives indications from the sensor. This system is protected by a CB 26 circuit breaker marked "OAT" and located on the circuit breakers panel.

Aircraft with DAVTRON MC 303 indicator

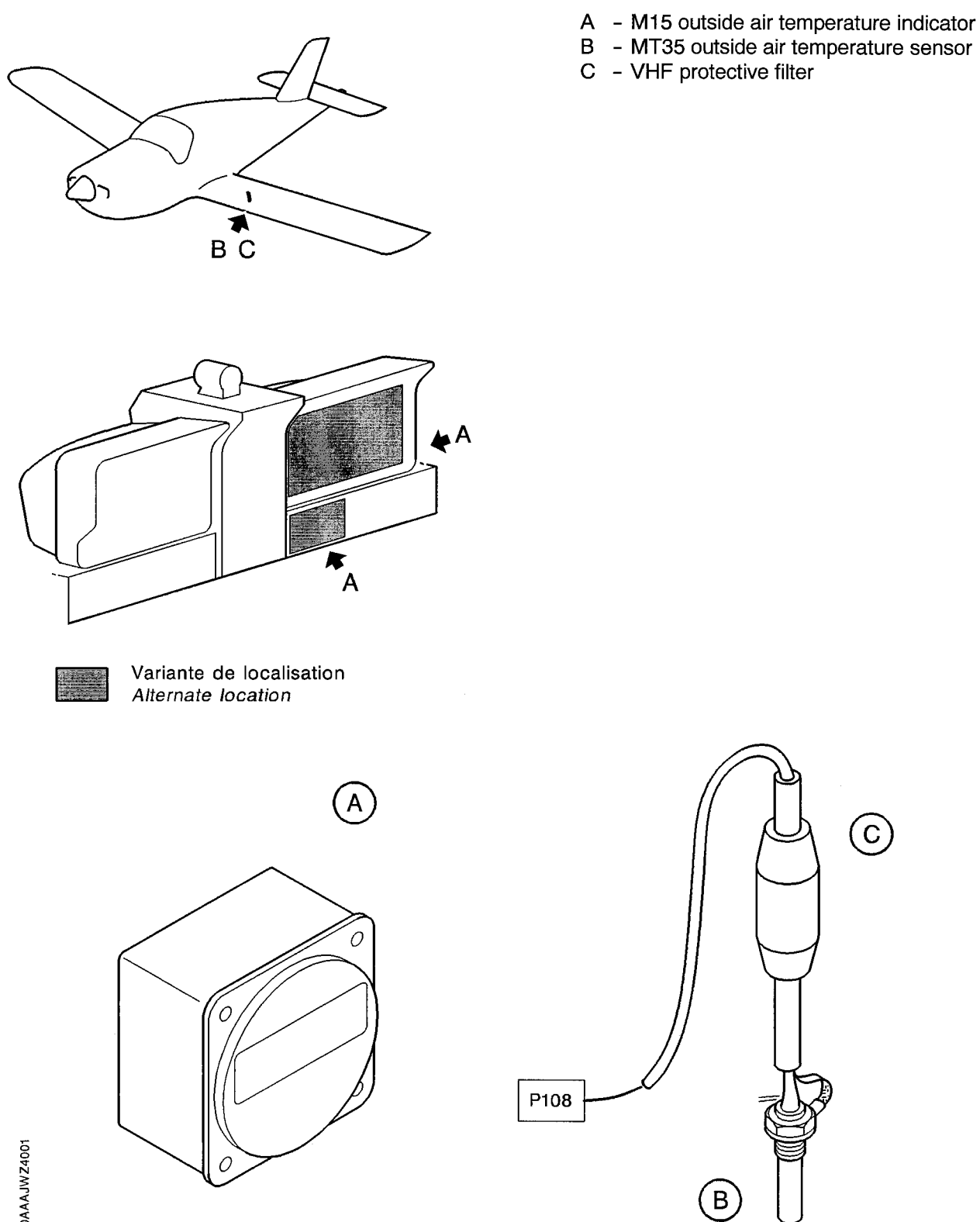
The digital readout indicator with integrated lighting (dimmed by photo cell) displays outside air temperature or the voltage of aircraft power system. The pushbutton located on the front panel of the indicator enables to select display sequentially in the following order :

- outside air temperature in Fahrenheit degrees (display : data + suffix F),
- outside air temperature in Celsius degrees (display : data + suffix C),
- voltage of aircraft power system (display : data + suffix E).

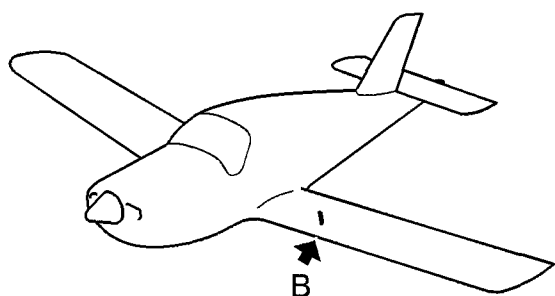
The indicator is located on the R.H. instrument panel. It receives indications from the sensor. This system is protected by a CB 26 "OAT" circuit breaker located on the circuit breakers panel.

4. OPERATION

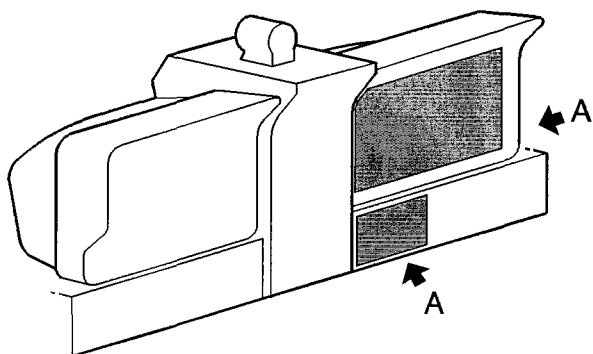
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



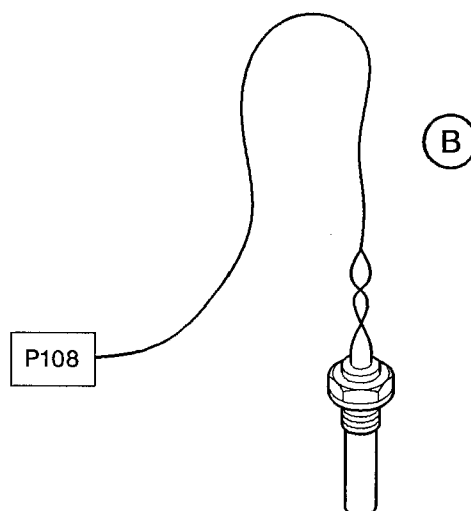
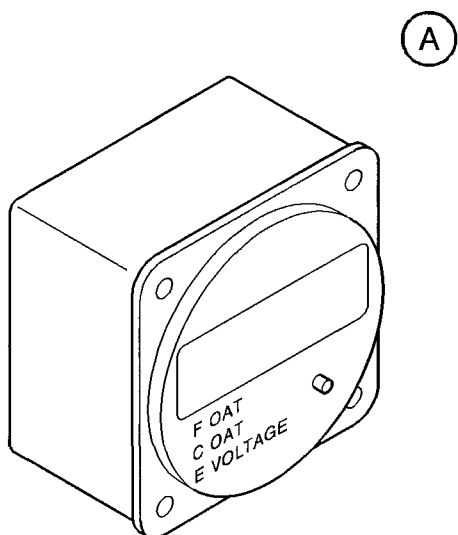
Outside air temperature - Identification and location of components
Figure 1 - With MC 377C indicator



- A - M15 outside air temperature indicator
- B - MT35 outside air temperature sensor



Variante de localisation
Alternate location



Outside air temperature - Identification and location of components
Figure 1A - With MC 303 indicator

I4341000AAA JWZ4200

ATTITUDE AND DIRECTION

DESCRIPTION AND OPERATION

1. GENERAL

The attitude and direction section concerns the equipment items which provide the pilot with data concerning the aircraft direction (heading) and attitude.

The installation includes :

- a heading reference system (option),
- a turn and bank indication (option),
- a magnetic compass,
- an ADI and standby horizon (option),
- a radio magnetic indication (option),
- an Electronic Flight Instrumentation System (EFIS) (option).

2. DESCRIPTION

A. Heading reference system - refer to 34-21-00

The heading reference system provides the pilot with a permanent stable heading reference.

B. Turn and bank indication - refer to 34-22-00

The turn coordinator informs the pilot about the flight symmetry and the rate of turn of the aircraft.

C. Magnetic compass - refer to 34-23-00

The magnetic compass provides the pilot with permanent heading information with respect to the earth's magnetic north.

D. ADI and standby horizon - refer to 34-24-00

The horizon provides the pilot with a true vertical stable reference.

E. Radio magnetic indication - refer to 34-25-00

The radio magnetic indication includes RMI indicator which repeats magnetic heading information and indicates bearing to VOR / ADF stations.

F. Electronic Flight Instrumentation System (EFIS) - refer to 34-28-00

The Electronic Flight Instrumentation System uses cathode ray tube to display navigation information.

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ATTITUDE AND DIRECTION

MAINTENANCE PRACTICES

CAUTION : A GYROSCOPE MUST NEVER BE REMOVED OR MOVED WHEN ROTATING OR DECELERATING. ALLOW 10 MINUTES OR MORE AFTER SUPPLY SOURCE CUTOFF (PNEUMATIC OR ELECTRICAL) BEFORE REMOVING OR HANDLING A GYROSCOPE.

CAUTION : GYROSCOPES ARE FRAGILE INSTRUMENTS AND MUST BE HANDLED WITH THE GREATEST CARE. AVOID CARELESS HANDLING OF SENSITIVE INSTRUMENTS.

CAUTION : IN CASE OF SHIPMENT BACK TO THE MANUFACTURER, THE GYROSCOPE MUST BE IMPERATIVELY SHIPPED IN A SPECIFIC PADDED PACKING SIMILAR TO THE ORIGINAL ONE. DURING SHIPMENT, A POORLY PACKED INSTRUMENT MAY EXPERIENCE MORE SEVERE MALFUNCTIONS THAN THOSE AT THE ORIGIN OF ITS RETURN.

1. SERVICING

Refer to 34-23-00.

2. REMOVAL / INSTALLATION - GYROSCOPIC INSTRUMENTS

A. Tools and consumable materials

- Wire brush
- Teflon tape (TB 09-901)
- Cleaning agent (TB 11-003)
- Blanking caps and plugs
- Clean lint-free cloths

B. Removal of a horizon or a air-driven directional gyro

- 1) Make sure that the main switch-breaker is open.
- 2) Tilt the instrument panel on which the gyroscopic instrument is secured - refer to 31-10-01.
- 3) Remove the screws, the washers and the upper cover of the instrument panel.
- 4) Mark and disconnect the hoses and the electrical connections.
- 5) Remove the front cover (if installed) of the instrument panel and remove the gyroscopic instrument.
- 6) Blank off the instrument fittings and the hoses.
- 7) If the gyroscopic instrument is to be replaced, retain the fittings, the attachment hardware and the lighting kit (if installed). Blank off the outlets of the instrument.

NOTE : Mark fitting direction on the instrument, then remove fittings.

C. Installation of a horizon or a air-driven directional gyro

- 1) If necessary, install the fittings on the gyroscopic instrument :
 - a) Clean the threads of the fittings.

- b) Wind one and a half to two turns of teflon tape (TB 09-901) around the threads of each fitting in the direction of the threads while sufficiently tensioning the tape during its installation.
 - c) Install the fittings on the instrument, comply with the positions marked during removal. Tighten the fittings to the required torque – refer to 20-00-01.
- 2) If necessary, install the instrument lighting kit.
 - 3) Secure the instrument on the instrument panel. Connect the hoses and the electrical connectors.
 - 4) Install the front cover (if installed) of the instrument panel.
 - 5) Make sure all the tools and materials are removed and the work area is clean and free from debris.
 - 6) Position and secure the instrument panel – refer to 31-10-01.
 - 7) Perform an operational test of the instrument.

HEADING REFERENCE SYSTEM

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The optional heading reference system provides the pilot with :

- heading information,
- information concerning the position of the aircraft with respect to the selected course.

It is also a gyroscopic system slaved to the magnetic North by a flux valve.

The system consists of :

- the A70 slaved directional gyro,
- the A71 flux valve,
- the M70 slaving accessory,
- the M73 HSI (Horizontal Situation Indicator).

The HSI receives navigation data from NAV 1 installation - refer to 34-51-00. It may also receive navigation data from GPS system (option) - refer to 34-57-00.

The HSI may transmit heading-related information to :

- the optional radio magnetic indication system - refer to 34-25-00,
- the optional stormscope system - refer to 34-41-00.

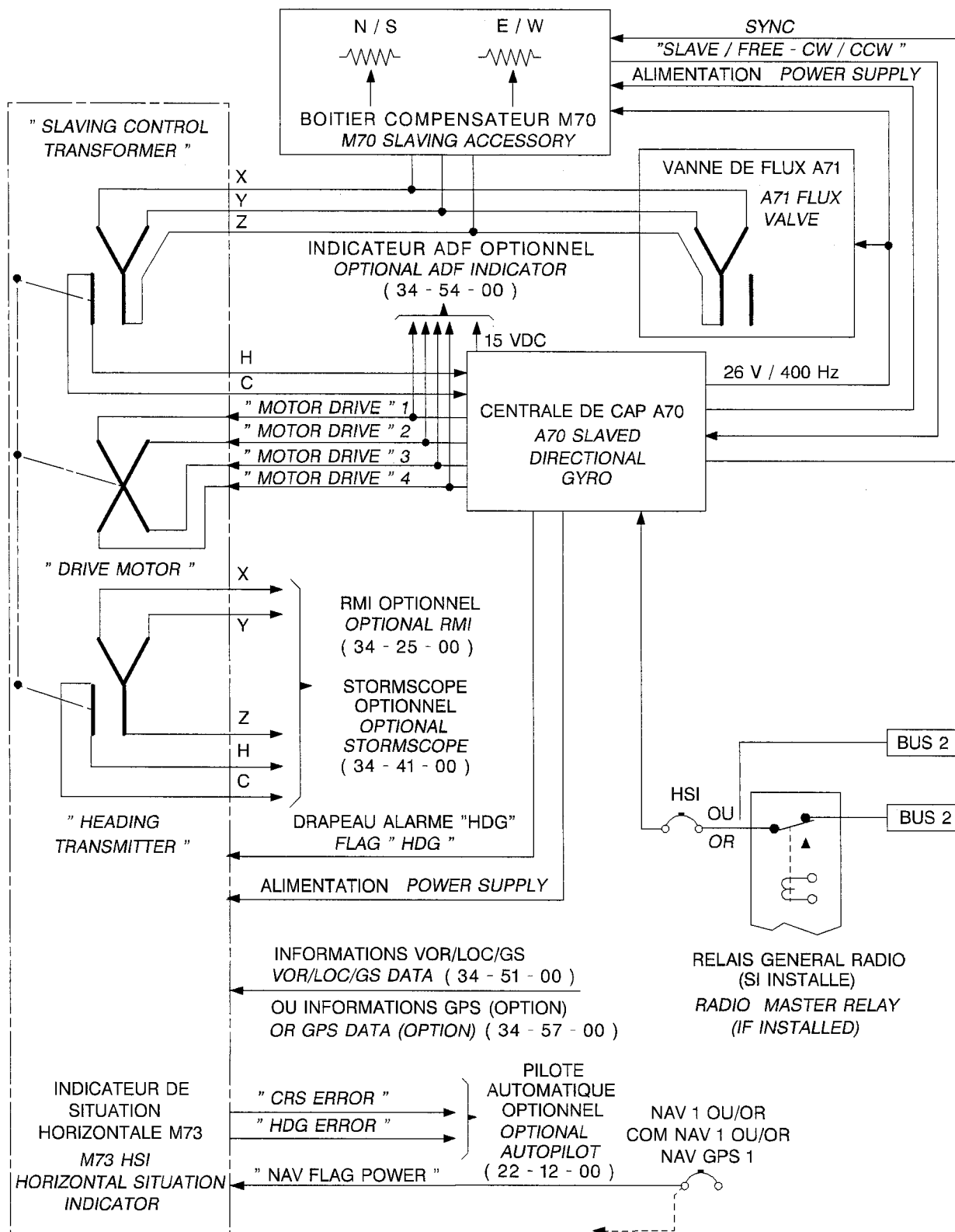
The system sends data to :

- the optional autopilot system - refer to 22-12-00,
- the optional ADF indicator (with slaved compass card) - refer to 34-54-00.

The system is electrically supplied by "BUS 2" bar.

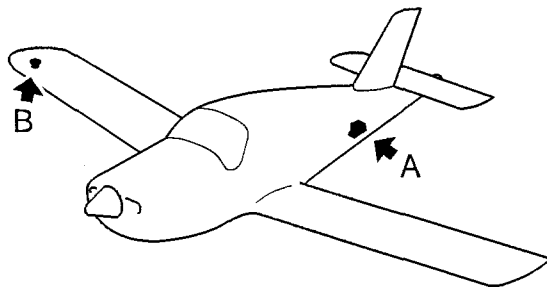
2. LOCATION (Figures 2 and 3)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A70 slaved directional gyro	1	220	242	34-21-01
A71 flux valve	1	620	622	34-21-00
M70 slaving accessory	1	250	/	34-21-00
M73 HSI (Horizontal Situation Indicator)	1	251L	/	34-21-00
Circuit breakers :				
- "HSI"	1	230	232L	WM
- "NAV 1" or "COM NAV 1" or "NAV GPS 1"	1	230	232L	WM

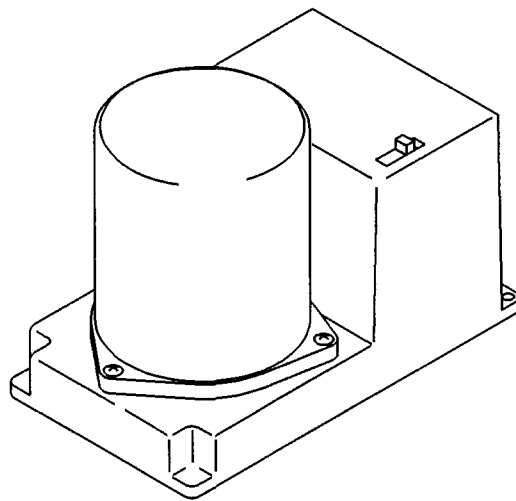


Heading reference system - Electrical schematic
Figure 1

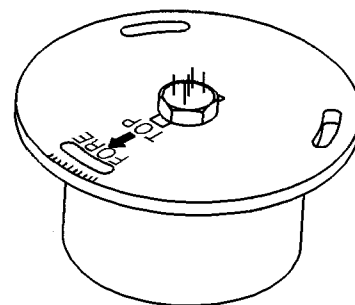
- A - A70 slaved directional gyro
- B - A71 flux valve



(A)

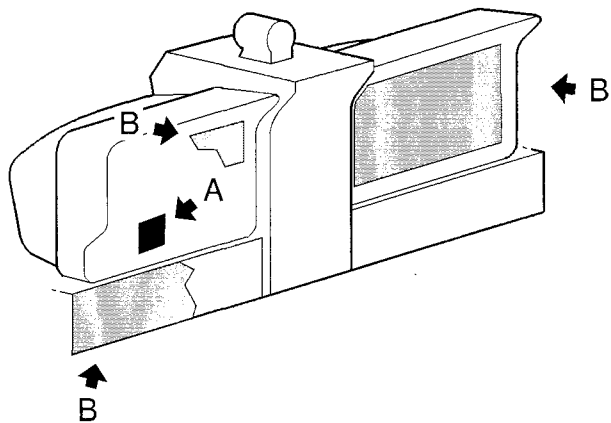


(B)



14342100AAAEWZ5000

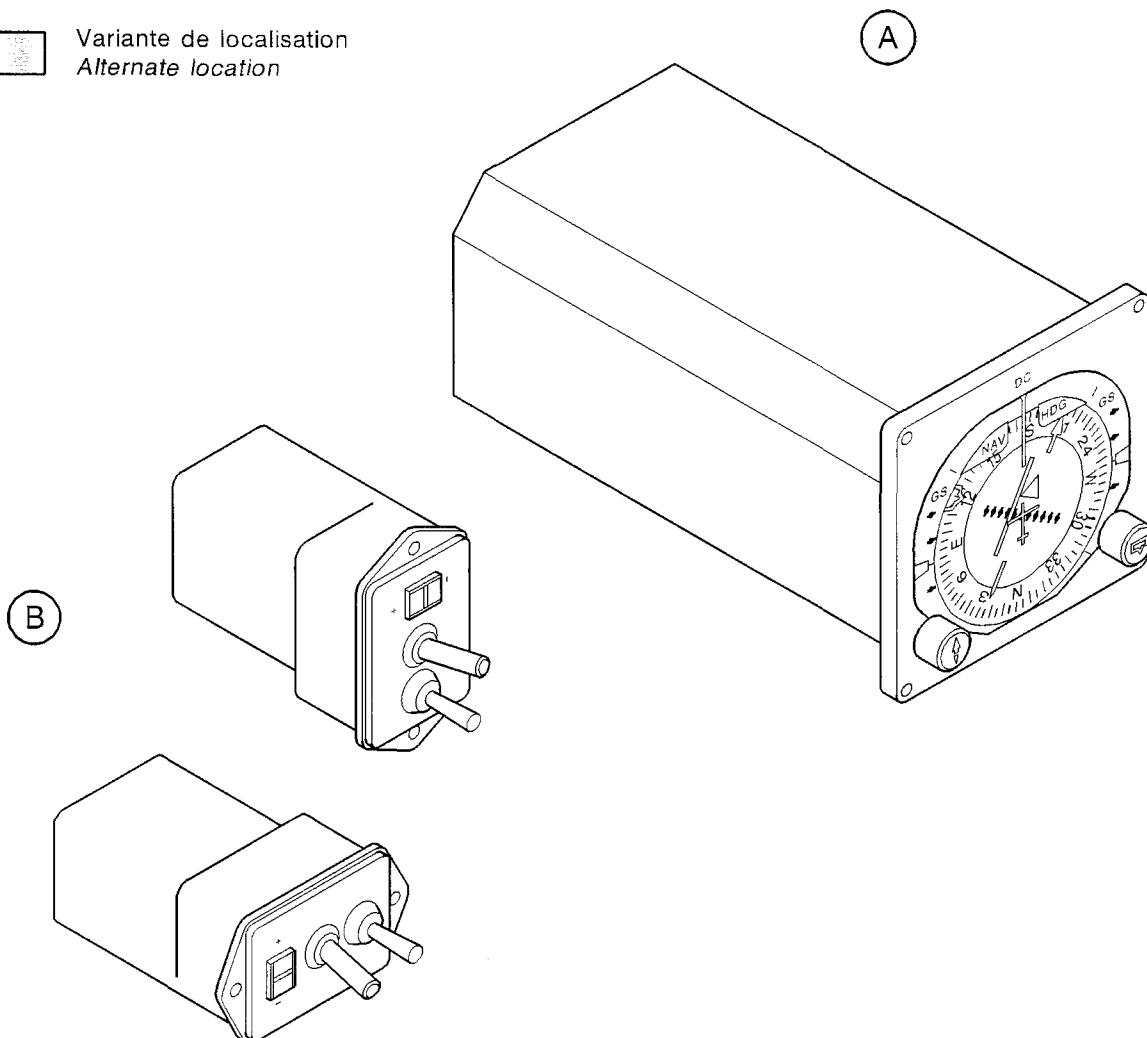
Heading reference system - Identification and location of components
Figure 2



- A - M73 HSI
B - M70 slaving accessory (vertical or horizontal installation)



Variante de localisation
Alternate location



Heading reference system - Identification and location of components
Figure 3

3. DESCRIPTION

A. A70 slaved directional gyro

The slaved directional gyro provides the system with gyro-stabilization. It includes the slaving circuitry necessary for system operation.

It is composed of :

- a gyroscopic assembly housed into a cylindrical case,
- an electronic assembly housed into a metallic unit on which the gyroscopic assembly is secured. It ensures the slaving of the system and also generates DC/AC currents for the HSI (Horizontal Situation Indicator), the flux valve and the slaving accessory.

The system uses the deviation signals generated by the HSI to generate the commands so as to permanently align directional heading data (HSI) with the magnetic heading reference provided by the flux valve.

The slaved directional gyro is electrically supplied by "BUS 2" bar via the "HSI" circuit breaker.

The slaved directional gyro is located behind frame C6 on the L.H. side.

B. A71 flux valve

The flux valve senses the horizontal direction of the earth's magnetic field and transmits the information to the Horizontal Situation Indicator.

It has the shape of a half-spherical case with a support plate for assembly attachment on the aircraft structure.

The flux valve houses a magnetic system composed of three coils positioned at 120° and a primary bearing (excitation).

The dampening of the system is ensured by a fluid with appropriate viscosity.

The excitation voltage necessary for flux valve operation is supplied by the slaved directional gyro.

The flux valve is mounted in the R.H. wingtip, on the upper face. It can be reached through access door 622.

C. M70 slaving accessory

The slaving accessory enables the pilot to select the operation mode of the system.

It is composed of a front panel equipped with the controls and a body including two electrical connectors.

The plastic cover of the body has two ports providing access to two adjustment potentiometers.

The slaving accessory includes :

- a deviation indicator (millivoltmeter) to display the deviation between the directional information (HSI) and the magnetic reference point (flux valve),
- a "SLAVE-FREE" inverter for the selection of the system operating mode ("slaved gyro" mode and "free gyro" mode),
- a two-position (CW / CCW) switch for manual adjustment of the directional heading when the "FREE" mode is selected,
- two potentiometers for magnetic compensation of the flux valve.

One of the potentiometers performs the correction along the NORTH / SOUTH axis and the other potentiometer along the EAST / WEST axis.

The + 5VDC electrical supply is provided by the slaved directional gyro.

The slaving accessory is installed on the R.H. instrument panel or, as an alternative, on the L.H. strip or upper R.H. portion of L.H. instrument panel.

D. M73 HSI (Horizontal Situation Indicator) (Figure 4)

The horizontal situation indicator centralizes the following data on a single instrument :

- a heading reference point,
- an indication concerning the lateral deviation of the aircraft in relation to a VOR radial, a desired course (NAV or GPS) or the axis of a LOCALIZER,
- an indication concerning the vertical deviation of the aircraft in relation to a glide slope (GLIDE).

The front face of the indicator includes :

- a lubber line that indicates the aircraft magnetic heading on the compass card,
- a course pointer that indicates, as the case may be, the VOR radial, the desired course (NAV or GPS) or the runway alignment axis selected on the compass card,
- a deviation bar that indicates the deviations with respect to the VOR radial, the desired course (NAV or GPS) or to the runway alignment axis,
- the glide slope pointers that indicate the vertical deviation with respect to the glide slope. The pointers are visible only when the glide slope signal is valid,
- a NAV warning flag which drops into view following the loss of a signal or the failure of the VOR or GPS receiver,
- an HDG warning flag which becomes visible if the system fails,
- a course select knob which allows rotating the course pointer on the compass card,
- a heading select knob which allows positioning the heading marker on the compass card.

The horizontal situation indicator transmits the heading signal to the optional RMI and the optional stormscope via a synchro-transmitter.

The horizontal situation indicator also provides the optional autopilot with the course and heading signals (DC voltages) determined by the respective position on the compass card of the course pointer and the heading marker.

The horizontal situation indicator receives several electrical supplies from the slaved directional gyro. Only the NAV warning flag processing circuitry is supplied via the circuit breaker of the NAV 1 system.

The horizontal situation indicator is installed on the L.H. instrument panel.

4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

The heading reference system being in the slaved gyro mode "SLAVE", when energized, the HSI compass card will automatically fast slave at the rate of 180° per minute to align with the magnetic heading detected by the flux valve. When the deviation between the heading of the directional gyro and the magnetic heading is cancelled, the slow (3° per minute) slaving function is initiated to keep both headings aligned.

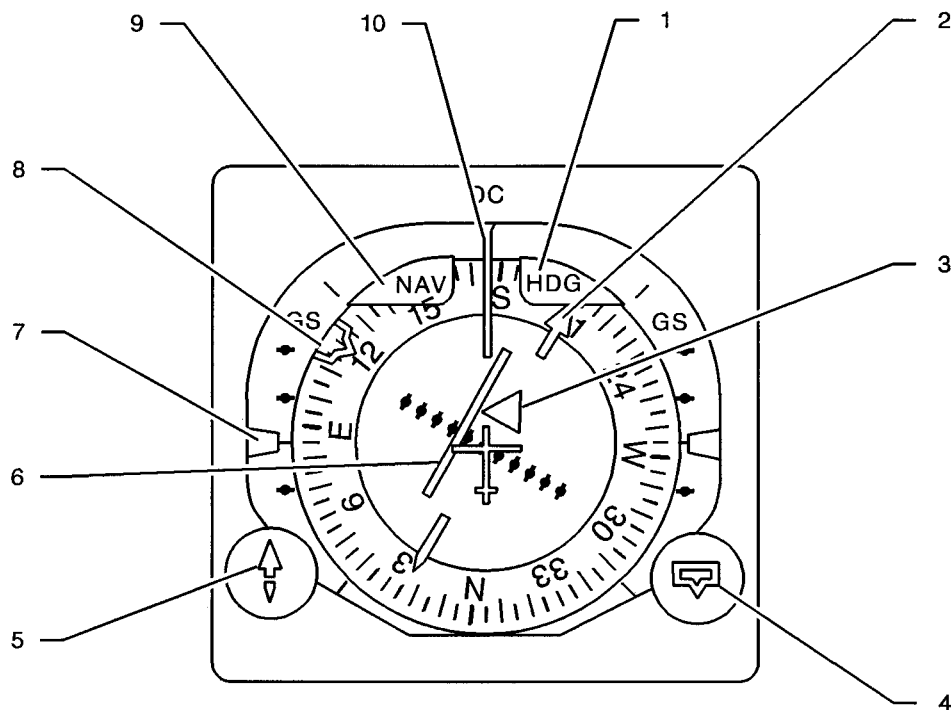
The deviation pointer (if provided) of the slaving accessory indicates the deviation between the heading of the directional gyro and the magnetic heading (deflection of the pointer with respect to the fixed marker).

The "HDG" warning flag comes into view when :

- the rotation speed of the directional gyro is incorrect,
- the electrical power applied to the system is insufficient.

The heading reference system being in the free gyro mode "FREE", the pilot manually cancels the deviation indicated by the slaving accessory deviation pointer using the "CW - CCW" switch. The heading of the directional gyro is thus aligned with the magnetic heading.

- 1 - "HDG" warning flag
- 2 - Course pointer
- 3 - "TO-FROM" indicator
- 4 - Heading select knob
- 5 - Course selection knob
- 6 - Deviation bar
- 7 - "GLIDESLOPE" pointer
- 8 - Heading select bug
- 9 - "NAV" warning flag
- 10 - Lubber line



Heading reference system - M73 Horizontal Situation Indicator (HSI)
Figure 4

14342002AAAAZY4001

HEADING REFERENCE SYSTEM

DESCRIPTION AND OPERATION

1. GENERAL

The purpose of the heading reference system is to provide the pilot with a visual display of aircraft heading.

The system is composed of a directional gyro indicator. The directional gyro indicator is air-driven and uses the aircraft's vacuum system - refer to 37-11-00.

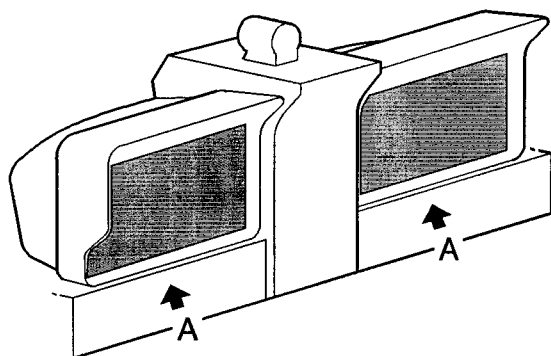
2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Directional gyro indicator	1	251L or 251 R	/	34-20-00

3. OPERATION

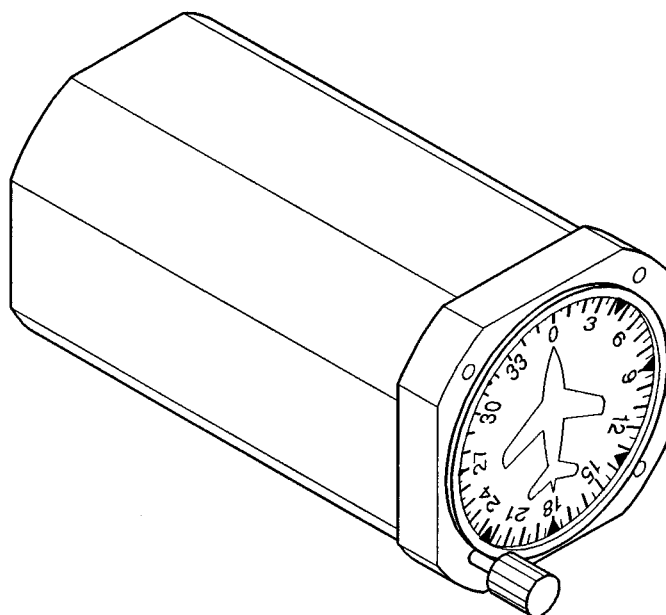
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

A - Directional gyro indicator



Variante de localisation
Alternate location

(A)



I4342100AAADVZ4200

Heading reference system - Identification and location of components
Figure 1

AIAI

Validity : Air-driven directional gyro

34-21-00 (CI)

Page 2
FEB 00

HEADING REFERENCE SYSTEM

DESCRIPTION AND OPERATION

1. GENERAL

The purpose of the heading reference system is to provide the pilot with a visual display of aircraft heading.

The system is composed of :

- the M35 directional gyro indicator,
- the S117 "DIRECT. GYRO" ON / OFF switch.

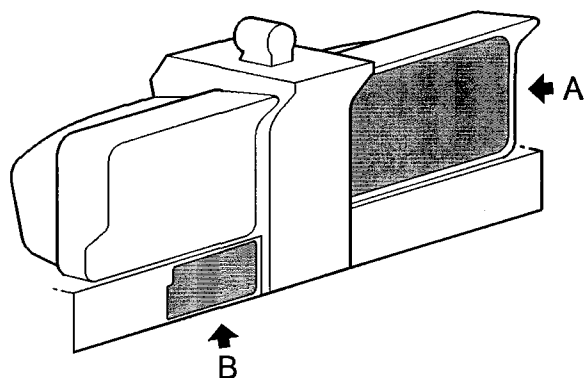
The directional gyro indicator is electrically supplied by "BUS 2" bar via the ON/OFF switch and protected by CB35 "DIRECT. GYRO" circuit breaker.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M35 directional gyro indicator	1	251R	/	/
S117 "DIRECT. GYRO" ON / OFF switch	1	250	/	/
Circuit breaker : - CB35 "DIRECT. GYRO"	1	PL1	/	WM

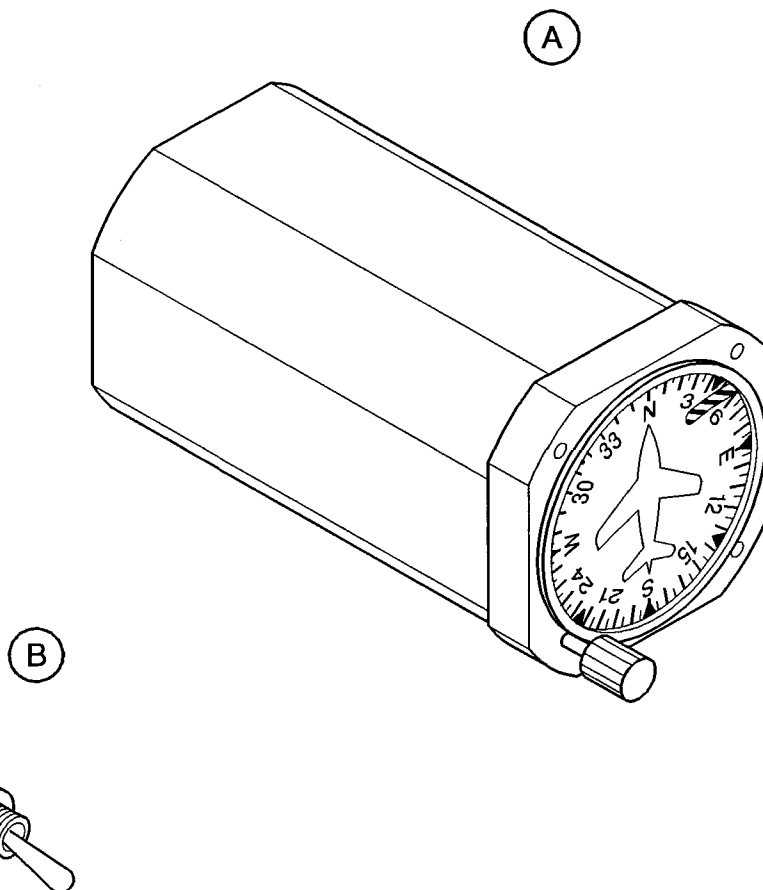
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



- A - M35 directional gyro indicator
- B - S117 "DIRECT. GYRO" ON / OFF switch

 Variante de localisation
Alternate location



14342100AAAADVZ24100

Heading reference system - Identification and location of components
Figure 1

SLAVED DIRECTIONAL GYRO MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - SLAVED DIRECTIONAL GYRO (Figure 201)

A. Tools and consumable materials

Blanking caps and plugs

B. Removal of the slaved directional gyro

CAUTION : OBSERVE ALL THE INSTRUCTIONS RELATIVE TO THE HANDLING OF GYROSCOPES DESCRIBED IN 34-20-00, PAGE 201.

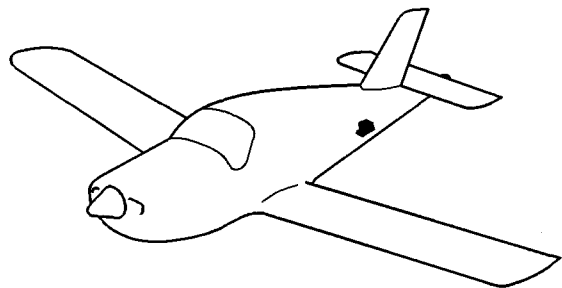
- 1) Make sure that the main switch-breaker is open.
- 2) Open baggage compartment door 219 and remove compartment bottom door 242.
- 3) Disconnect connector (1).
- 4) Remove screws (3).
- 5) Remove slaved directional gyro (4). Blank off connector (1).
- 6) If mounting rack (5) removal is necessary, remove screws (7).
- 7) Remove mounting rack (5).

C. Installation of the slaved directional gyro

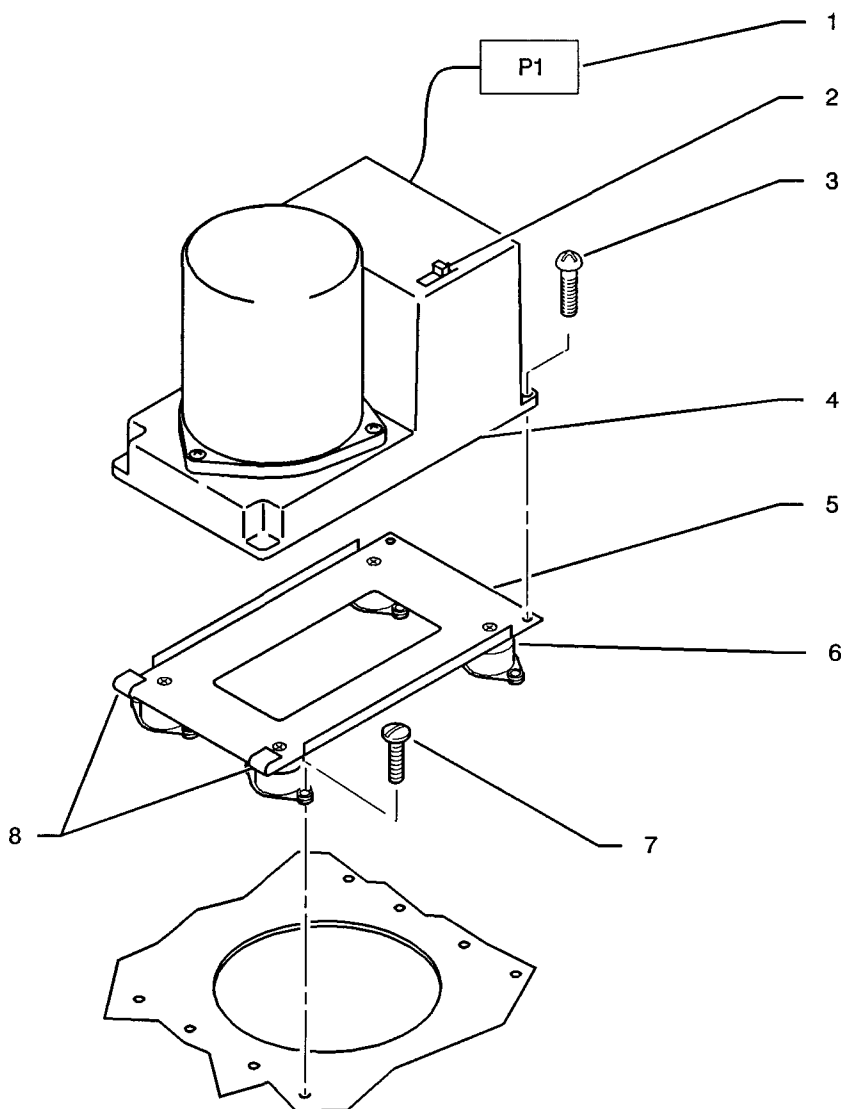
- 1) Make sure that the main switch-breaker is open.
- 2) If removed, install mounting rack (5), direct snaps (8) towards the front of the aircraft, and secure the mounting rack with screws (7).

CAUTION : THE SLAVED DIRECTIONAL GYRO FEATURES A VOLTAGE SELECTOR (2), MAKE SURE THE LATTER IS SET TO 24 VDC.

- 3) Engage the slaved directional gyro (4) into the snaps (8) of mounting rack (5).
- 4) Position the grounding lugs of the electrical screening and the bonding strap, and install screws (3).
- 5) Remove the blanking cap of connector (1).
- 6) Connect connector (1).
- 7) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 8) Install compartment bottom door 242 and close baggage compartment door 219.



- 1 - Connector
- 2 - Voltage selector
- 3 - Screw
- 4 - Slaved directional gyro
- 5 - Mounting rack
- 6 - Vibration damper
- 7 - Screw
- 8 - Snap



Slaved directional gyro - Removal / Installation
Figure 201

14342100AAAEWZ4100

TURN AND BANK INDICATION

DESCRIPTION AND OPERATION

1. GENERAL

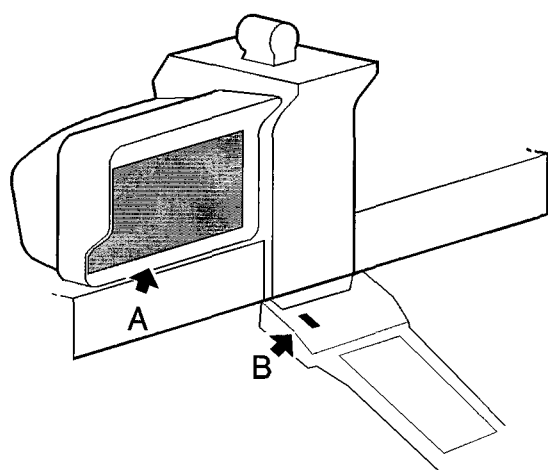
- The purpose of the turn and bank indication system is to indicate the angular speed of the aircraft around its vertical axis.
- Option Pre-MOD. 151, Standard Post-MOD. 151
The system is composed of :
 - a turn coordinator,
 - a switch-breaker identified by "TURN-COORD" or "⚠".
- The system is electrically supplied by "BUS 2" bar via "TURN-COORD" switch-breaker.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Turn coordinator	1	251L	/	/
- Switch-breaker "TURN-COORD." or "⚠"	1	250	/	WM

3. OPERATION

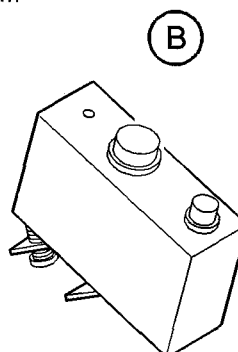
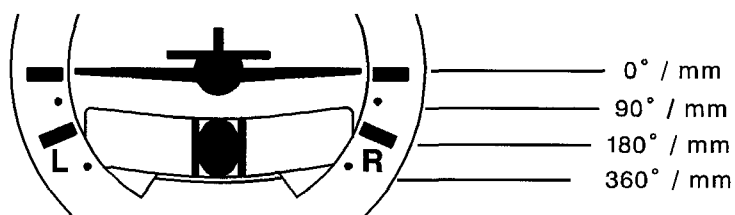
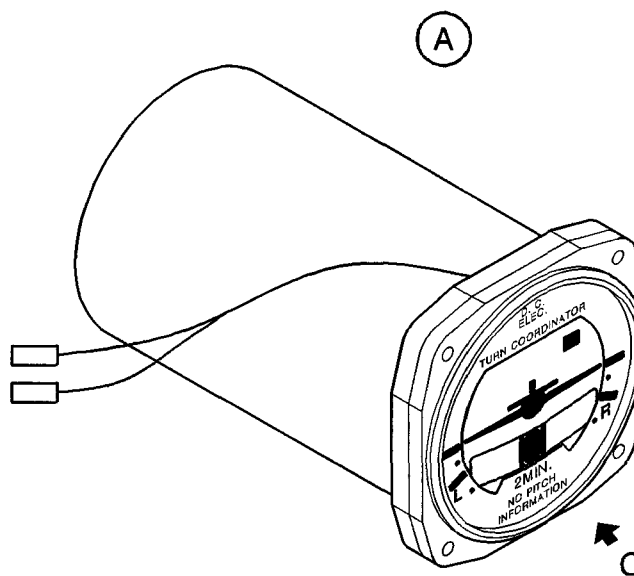
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



- A - Turn coordinator
- B - Switch-breaker



Variante de localisation
Alternate location



Turn and bank indication - Identification and location of components
Figure 1

14342200AAA EVZ4001

ACAA

Validity : L.H. instrument panel

34-22-00 (BI)

Page 2
FEB 00

TURN AND BANK INDICATION

DESCRIPTION AND OPERATION

1. GENERAL

The purpose of the optional turn and bank indication system is to indicate the angular speed of the aircraft around its vertical axis.

The system is composed of :

- a turn coordinator,
- an ON / OFF switch.

The turn coordinator energization is carried out by setting the "R TURN-COORD." or "2ND TURN-COORD." switch to "ON".

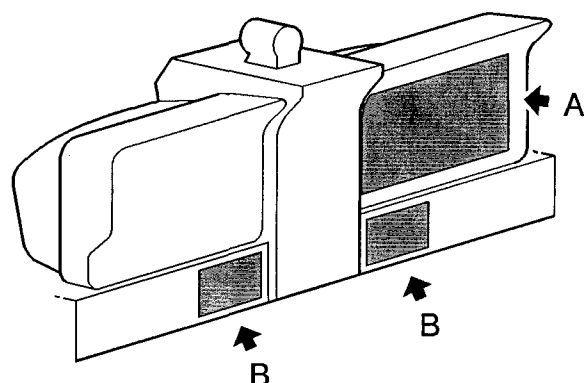
The system is electrically supplied by "BUS 3" bar via the "R TURN-COORD." or "2ND TURN-COORD." circuit breaker.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Turn coordinator	1	251R	/	/
"R TURN-COORD." or "2 ND TURN-COORD." ON / OFF switch	1	254L or 254R	/	/
Circuit breaker: - "R TURN-COORD." or "2 ND TURN-COORD."	1	230	232L	WM

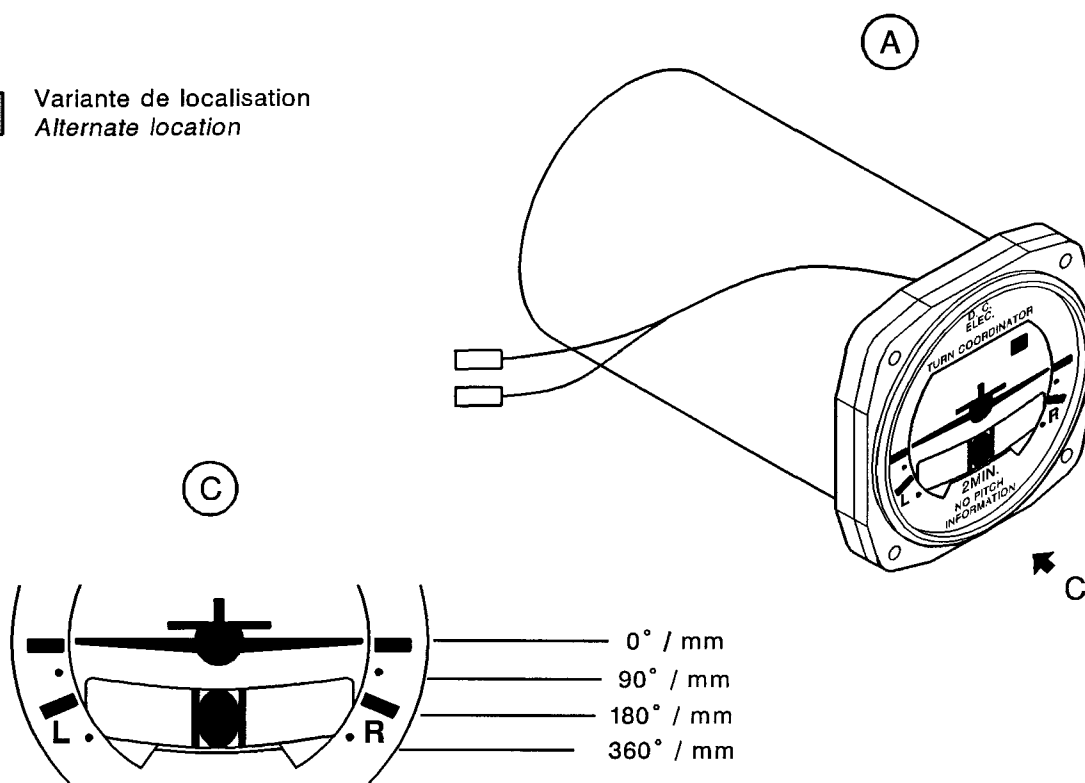
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



- A - Turn coordinator
- B - "R TURN-COORD." or
"2ND TURN-COORD." ON / OFF switch

 Variante de localisation
Alternate location



I4342200AAAEVZ4200

Turn and bank indication - Identification and location of components
Figure 1

TURN AND BANK INDICATION

DESCRIPTION AND OPERATION

1. GENERAL

The turn and bank indication system uses an inclinometer which shows banking information when the aircraft is turning.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Inclinometer	1	251L	/	/

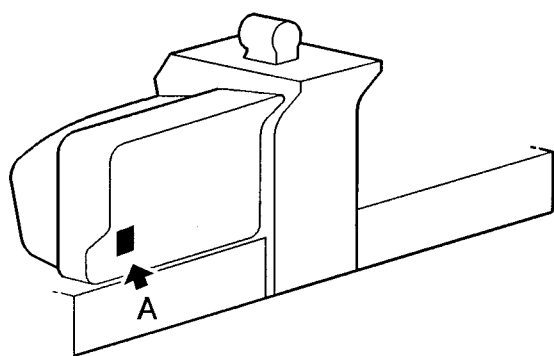
3. DESCRIPTION

A. Inclinometer

The simple type inclinometer is made of a bent and sealed glass tube, which contains kerosene and a black agate or a common steel ball.

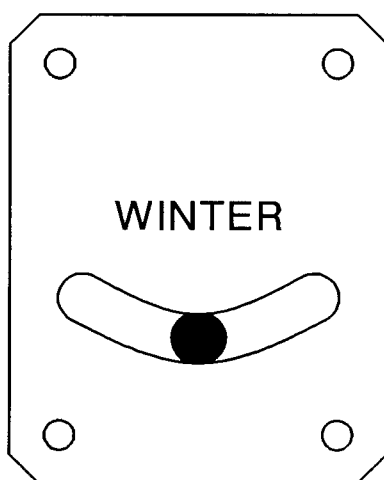
This ball moves freely inside the tube. The kerosene acts as a damper. Therefore, it allows a regular movement of the ball. The tube is curved so that the ball tends to move towards the lowest point when the tube is horizontal. The tube has a small projection on the L.H. side including an air bubble, which compensates the expansion of the kerosene during the changes in temperature. Two marks show the right position of the ball inside the tube.

It is located on the L.H. instrument panel.



A - Inclinometer

(A)



I4342000AAAAZY4201

Turn and bank indication - Identification and location of components
Figure 1

TURN-AND-BANK INDICATION

DESCRIPTION AND OPERATION

1. GENERAL

The purpose of the turn-and-bank indication system is to measure the angular speed of the aircraft around its vertical axis.

The system is composed of :

- a M32 turn-and-bank indicator,
- a CB72 "TURN-COORD." or "⌚" switch-breaker.

M32 turn-and-bank indicator is electrically supplied by "BUS 2" bar.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M32 turn-and-bank indicator	1	251L	/	34-22-00
Switch-breaker : - CB72 "TURN-COORD." or "⌚"	1	250	/	WM

3. DESCRIPTION

A. M32 turn-and-bank indicator

M32 turn-and-bank indicator provides information on :

- the turn speed of the aircraft,
- the direction of the turn,
- the flight symmetry (slipping).

The front face of the equipment features :

- a transverse level composed of a glass tube inside which a ball moves,
- a needle which provides the angular speed of the aircraft around its vertical axis when the latter is turning. A travel of the size of the needle width corresponds to a turn angular speed of 1 turn within 4 min.,
- a window cut out into the dial located in the upper L.H. portion. When the turn-and-bank indicator is not electrically supplied or in the event of a failure, a warning flag drops into view.

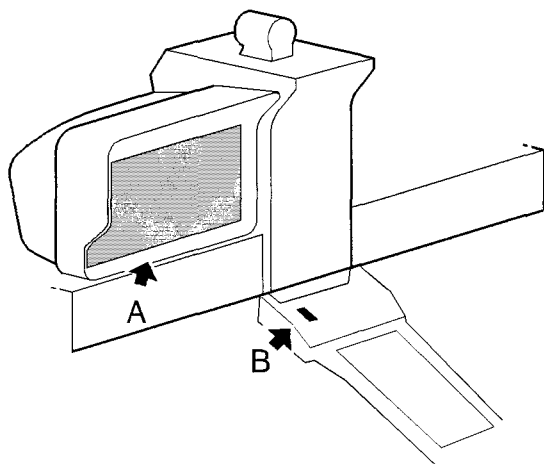
M32 turn-and-bank indicator is electrically supplied by "BUS 2" bar via CB72 switch-breaker.

M32 turn-and-bank indicator is mounted in the lower L.H. corner of L.H. instrument panel.

B. CB72 switch-breaker

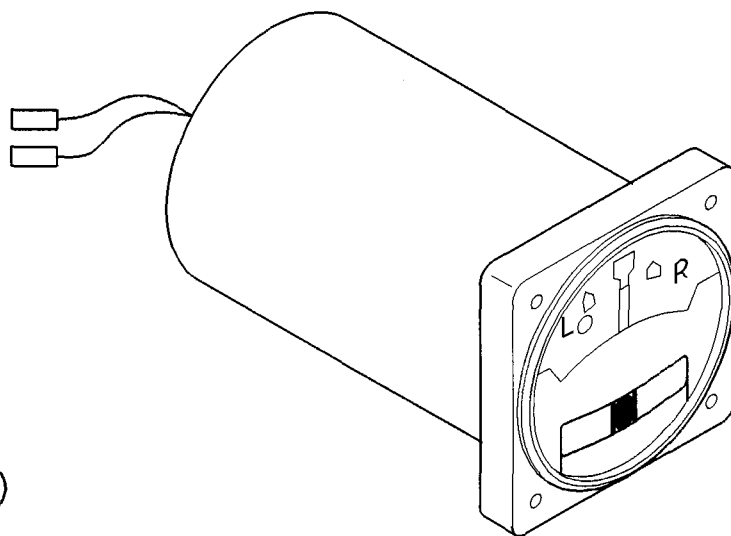
"TURN-COORD." or "⌚" switch-breaker located on central pedestal, controls the ON / OFF function of the equipment.

- A - M32 turn-and-bank indicator
- B - CB72 switch-breaker

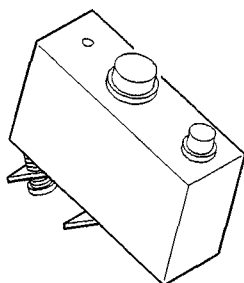


Variante de localisation
Alternate location

(A)



(B)



Turn-and-bank indication - Identification and location of components
Figure 1

14342200AAA EVZ14000

AFAD

Validity : Option OPT10 34002A

34-22-00 (BU)

Page 2
JUN 04

4. OPERATION

The equipment is energized by closing the switch-breaker. The warning flag goes out of view when the gyroscope rotor reaches the required operation speed.

The M32 turn-and-bank indicator is ready to measure the angular speed of the aircraft around its vertical axis. The red warning flag will drop into view in the indicator window to alert the pilot when the supply voltage of the equipment is interrupted or when it becomes insufficient.

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MAGNETIC COMPASS

DESCRIPTION AND OPERATION

1. GENERAL

The magnetic compass is an independent instrument which provides the pilot with information concerning the earth's magnetic field.

The installation is composed of :

- the magnetic compass,
- the compensation assembly (Option).

The lighting of the magnetic compass is ensured by "BUS 1" bar.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Magnetic compass	1	250	/	/
Compensation assembly (Option)	1	250	/	/
Fuse: - "COMPASS LIGHTING"	1	250	Fuse panel	WM

3. DESCRIPTION

The magnetic compass is composed of a case filled with dampening liquid in which a graduated compass card, visible through a window, moves. The magnetic heading is read on the compass card in front of a lubber line.

A compensation device, located on the front face, allows correcting the magnetic compass deviations caused by the environment magnetic influence (aircraft structure and electrical installations).

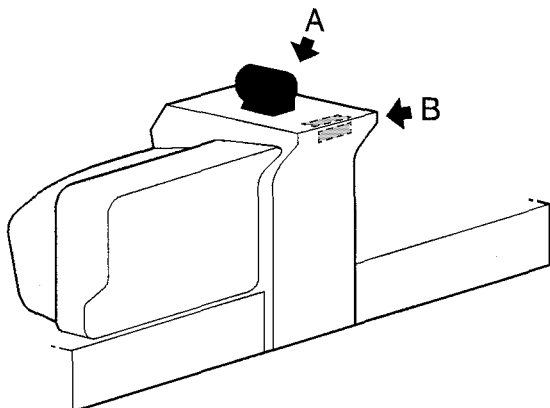
NOTE : When this device does not allow correcting the deviations sufficiently, a compensation assembly, composed of a box fitted with a magnet, is secured inside the upper portion of the radio rack.

The internal lighting of the magnetic compass is supplied by "BUS 1" bar via "COMPASS LIGHTING" fuse. The fuse is located in the fuse panel secured on the firewall (Frame C0).

4. OPERATION

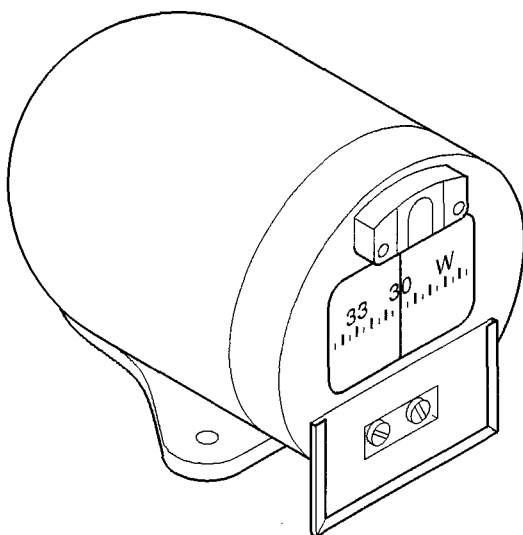
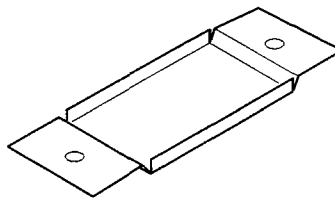
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

- A - Magnetic compass
- B - Compensation assembly



Variante de localisation
Alternate location

(B)



(A)

Magnetic compass - Identification and location of components
Figure 1

14342001AAA CVZ4001

AAAA

Validity : S / N 823 - 849, 888, 948 - 9999

34-23-00 (BA)

Page 2
JUN 04

MAGNETIC COMPASS MAINTENANCE PRACTICES

1. CALIBRATION OF COMPASSES (Figure 201)

NOTE : This method of compensation and calibration of aircraft magnetic compasses specifies maximum deviations permissible for each type of magnetic compass on all aircraft models.

A. Definitions

- 1) "CALIBRATION" means the measurement of residual deviations of a compass installed in an aircraft, once compensation has been carried out.
- 2) "COMPENSATION" means the correction of deviations resulting from magnetism in an aircraft.
- 3) "DEVIATION" means the angle required to be added algebraically to a compass reading to obtain the aircraft magnetic heading.
- 4) "DIRECT READING COMPASS" means a compass which has the magnetic sensing element and heading indication located in the same instrument.
- 5) "REMOTE INDICATING COMPASS (non-stabilised)" means a remote indicating compass (flux valve) without gyroscopic means of stabilization.
- 6) "REMOTE INDICATING COMPASS (stabilised)" means a compass system which has the magnetic sensing element located remotely from the indicator(s) together with gyroscopic means to stabilize or smooth the heading indications.
- 7) "STANDBY COMPASS" means a direct reading compass which is not used as the primary heading reference.

B. Calibration (Figure 201)

- 1) Compass calibration shall be conducted using approved compass calibration equipment or by aligning the axis of the aircraft with each cardinal and 30 degrees magnetic heading.
- 2) The deviation shall be determined at each magnetic heading with all equipment positioned and operating so that the magnetic effects of the aircraft as sensed by the compass(es) are as close as possible to those of straight and level flight.
- 3) The deviation at any heading shall not exceed :
 - a) 2 degrees for a remote indicating compass (stabilised).
 - b) 5 degrees for a remote indicating compass (non-stabilised).
 - c) 5 degrees for a direct reading compass used as the primary compass.
 - d) 10 degrees for a standby compass.

NOTE : An appropriate procedure for compass calibration is described in Paragraphs 7 and 8.

- 4) Any combination of aircraft systems, that are positioned, operated or loaded within their operating limits shall not vary the compass deviations as specified in paragraph B in excess of :
 - a) 2 degrees for a remote indicating compass (stabilised).
 - b) 4 degrees for a remote indicating compass (non-stabilised).
 - c) 5 degrees for a direct reading compass used as the primary compass.

- d) 8 degrees for a standby compass. Superior clearances may however be acceptable provided that a compensation plate is added to the standby compass.
- 5) These limitations do not apply to magnetic interference that occurs occasionally and for short periods.

2. COMPENSATION OF COMPASSES

CAUTION : COMPASS COMPENSATION SHALL BE PERFORMED AND CHECKED WHEN ENGINE IS RUNNING (2000 RPM) AND INSTRUMENTS ARE SET TO "ON" : RADIONAVIGATION, ELECTRICAL SLIP INDICATOR, NAVIGATION LIGHTS, FLASHING LIGHTS AND / OR ANTICOLLISION LIGHTS

NOTE : Engine rating of 2000 RPM has been chosen as the alternator full capacity is obtained from this rating on.

- 1) Compasses shall be compensated when the result of the compass calibration discloses :
 - a) a deviation which differs by 3 degrees or more from that anticipated from the previous calibration or
 - b) a deviation in excess of the limits specified in Paragraph B1 at any heading.
- 2) Compass compensation shall be performed by aligning the axis of the aircraft with each of the cardinal and 30 degree magnetic headings and :
 - a) determining the compass deviations.
 - b) compensating the compass for coefficients "X", "Y" and "Z" if they exceed 2 degrees.

NOTE : Paragraphs 7 and 8 give appropriate procedures for compass compensation.

3. COMPASS COMPENSATING AREA (Figure 201)

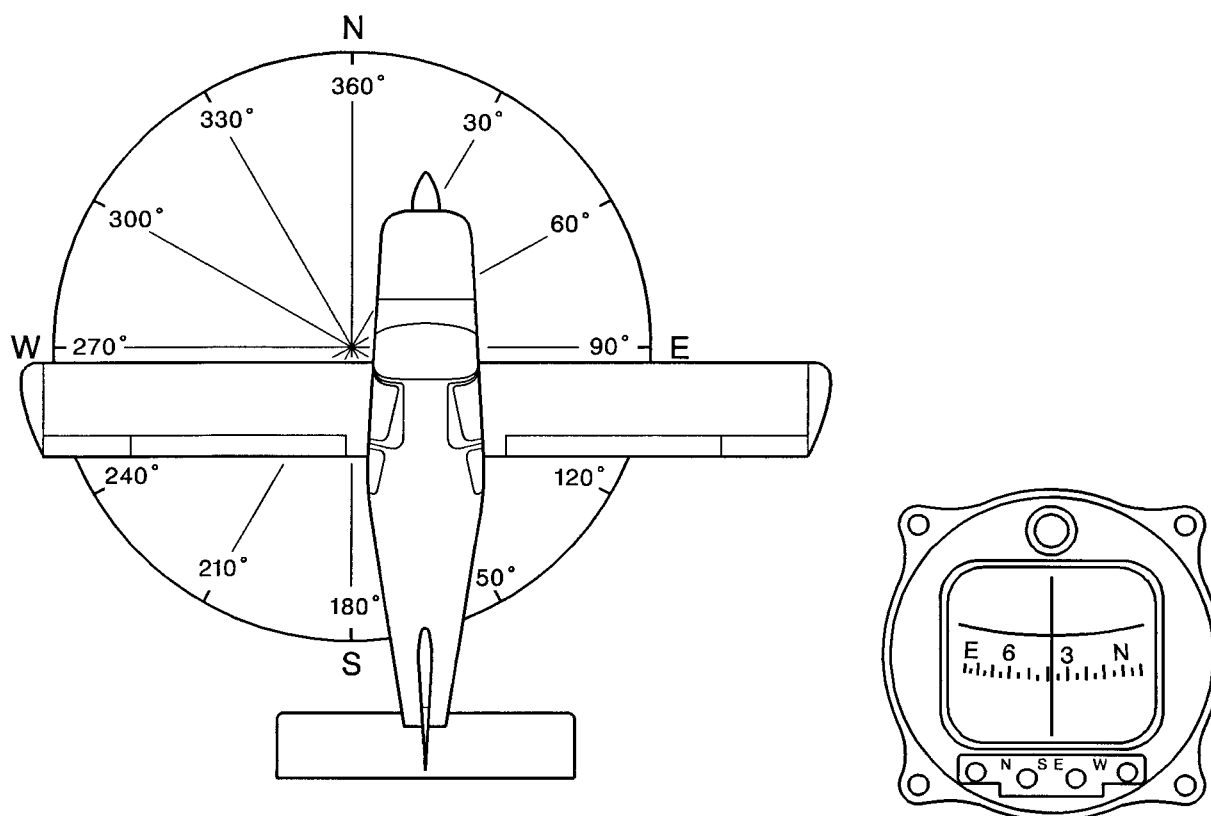
For convenience, a compass compensating area shall be suitable to maneuver the aircraft and shall be free from characteristics which would significantly affect the accuracy of compass calibrations or compensations. A site having a small number of low intensity stable magnetic anomalies is acceptable provided that surveyed corrections are used.

NOTE : Underground steel tanks, cables, reinforcement plates, steel hangars, and reinforced concrete runways are likely to cause magnetic anomalies.

4. PREPARATION FOR COMPASS COMPENSATION

Prior to any compass compensation the preparations outlined in this paragraph shall be completed.

- 1) The proper functioning of the compass must be checked and found to be in accordance with the compass manufacturer's specifications. Instead of the manufacturer's specifications, a direct reading compass may be substituted if :
 - a) there are no signs of leakage.
 - b) bubbles, excessive sediment and discolouration are not present in the liquid.
 - c) the pivot friction shall not exceed the compass manufacturer's tolerances except in cases where these tolerances are not known. The pivot friction shall be determined by deflecting (magnet) the compass past 10 degrees then removing the deflecting force after which the compass will return to ± 2 degrees of its original indication.
 - d) the compass mounting shall be sound and in good condition.
- 2) All equipment normally not carried in the aircraft shall be removed.



Cm	N	30	60	E	120	150
Cc						
Cm	S	210	240	W	300	330
Cc						
Date :				Radio on		

For	N	30	60	E	120	150
Steer						
For	S	210	240	W	300	330
Steer						
Date :				Radio on		

14342001AAACVZ4100

Checks and compensation of magnetic compasses
Figure 201

- 3) All equipment normally carried in the aircraft shall be stored in its usual position.
- 4) The flight controls shall be in their normal position for straight and level flight.

NOTE : Direct reading compasses shall be checked prior to installation to ensure that the compass element is balanced correctly.

5. COMPASS COMPENSATION PROCEDURE

The aircraft shall be turned at a magnetic heading within 5 degrees of that required at all check points.

The aircraft magnetic heading shall be determined by any logical means, such as bearing compasses, alignments, marks on ground.

NOTE : Appropriate procedures for compass calibration are described in Paragraphs 7 and 8.

6. RECORDING

The results of each compass calibration shall be entered in the Aircraft Log Book or a maintenance record.

A compass correction card - see Figure 201, shall be compiled for primary and standby compasses in legible form showing :

- 1) The magnetic heading and compass reading necessary to obtain the magnetic heading at the cardinal and intermediate 30 degree headings, unless the deviation in all cases is less than one degree, in which case the card may be endorsed "ERRORS LESS THAN 1°" instead of the corrected headings.
- 2) The corrections to be applied when there is a change in compass deviation, within the limits permitted in Paragraph B4 revealed during compass calibration due to a radio or any electrical device being turned on.
- 3) The date of the compass calibration.
- 4) The identification of the aircraft.
- 5) The type and serial number of the compass.
- 6) The signature of the person authorized to certify completion of the compass calibration.

NOTE : An additional card may be used if necessary to comply with the former paragraphs.

The compass correction card shall be protected against water or other damage and shall be installed near the compass, in easy view of the flight crew.

7. CALIBRATION PROCEDURE OF COMPASSES

CAUTION : COMPASS CALIBRATION SHALL BE PERFORMED AND CHECKED WHEN ENGINE IS RUNNING (2000 RPM) AND INSTRUMENTS ARE SET TO "ON" : RADIONAVIGATION, ELECTRICAL SLIP INDICATOR, NAVIGATION LIGHTS, FLASHING LIGHTS AND / OR ANTICOLLISION LIGHTS

- 1) Head the aircraft within 5 degrees of each cardinal and 30 degree magnetic heading.
- 2) Determine the deviation at each heading. At each magnetic cardinal heading, check whether a change in deviation occurs when engine(s) electrical or radio equipment is operated.
- 3) Repeat these checks at each 30 degrees if a change in deviation does occur.
- 4) Compare these results with the previous calibrations using Paragraphs 1, 2 and 6 as a guide.

8. COMPENSATION PROCEDURE OF COMPASSES

NOTE : Compensation may be performed by either the correction of coefficients "Y" and "Z" or by halving the deviations of complementary cardinal headings. Normally, the latter method is only used for direct reading compasses in aircraft always operated in VFR conditions for standby compasses.

A. Coefficient method

- 1) Set compensator magnets to neutral (if applicable).
- 2) Head the aircraft axis within 5 degrees of each magnetic cardinal heading and determine the deviations.

Calculate coefficients "X", "Y" and "Z" by the formula :

$$\text{Coefficient "X"} : \frac{\text{North Dev.} + \text{East Dev.} + \text{South Dev.} + \text{West Dev.}}{4}$$

$$\text{Coefficient "Y"} : \frac{\text{East Dev.} - \text{West Dev.}}{2}$$

$$\text{Coefficient "Z"} : \frac{\text{North Dev.} - \text{South Dev.}}{2}$$

- 3) With the aircraft on any magnetic cardinal heading add coefficient "X" algebraically to the compass reading to get the corrected magnetic heading.
Loosen attachments and rotate the compass (or the flux valve) until the compass reads the corrected heading. Normally, this adjustment is not applicable for panel mounted compasses.
- 4) Head the aircraft on magnetic North within 5 degrees. Add coefficient "Z" algebraically to the compass reading to determine the corrected magnetic heading. Adjust the North-South compensator to make the compass read the corrected reading.
- 5) Head the aircraft on magnetic East within 5 degrees. Add coefficient "Y" algebraically to the compass reading to determine the corrected magnetic heading. Adjust the East-West compensator to make the compass read the corrected reading.
- 6) Conduct the compass calibration specified in Paragraph 7.

B. Simplified method

- 1) Set the compensator magnets to neutral.
- 2) Determine and remove if applicable any coefficient "X" as specified in Paragraphs 2 and 3.
- 3) Head the aircraft on magnetic North within 5 degrees. Determine the aircraft magnetic heading and adjust the North-South compensator to make the compass read the aircraft magnetic heading.
- 4) Head the aircraft on magnetic East within 5 degrees. Determine the aircraft magnetic heading and adjust the East-West compensator to make the compass read the aircraft magnetic heading.
- 5) Head the aircraft on magnetic South within 5 degrees. Determine the aircraft magnetic heading. Adjust the North-South compensator to make the compass read half the difference between the aircraft magnetic heading and the compass reading.
- 6) Head the aircraft on magnetic West within 5 degrees. Determine the aircraft magnetic heading. Adjust the East-West compensator to make the compass read half the difference between the aircraft magnetic heading and the compass reading.
- 7) Conduct the compass calibration specified in Paragraph 7.

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ADI AND STANDBY HORIZON

DESCRIPTION AND OPERATION

1. GENERAL

■ The optional horizon is a piloting gyroscopic instrument supplying a permanent visual indication of the aircraft pitch and roll attitude with regard to the place vertical line.

The system is composed of an horizon gyro indicator (ADI 1).

The indicator is air-driven and uses the aircraft's vacuum system - refer to 37-11-00.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Horizon gyro indicator	1	251L	/	34-20-00

3. DESCRIPTION (Figure 2)

A. Horizon gyro indicator

The indicator has a gyroscope housed into a metallic square case. The rear face of the unit has three ports used to supply air to the gyroscope.

The front face consists of :

- an aircraft symbol which can be moved using an adjustment knob (depending on version),
- a lubber line,
- a moving background.

The aircraft attitude is given by the horizon bar linked to the gyro and the adjustable aircraft symbol fixed on the case.

The angular value of the aircraft in roll attitude is indicated by the lubber line and the circular roll scale. The angular value of the aircraft in pitch attitude is indicated by the aircraft symbol and the horizon bar pitch scale.

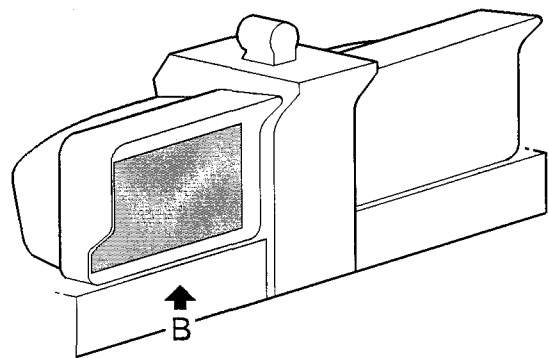
4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

The horizon gyro indicator is connected to the aircraft's vacuum system. The air, sucked into the indicator horizon gyro via a filter, rotates the gyroscope spinner.

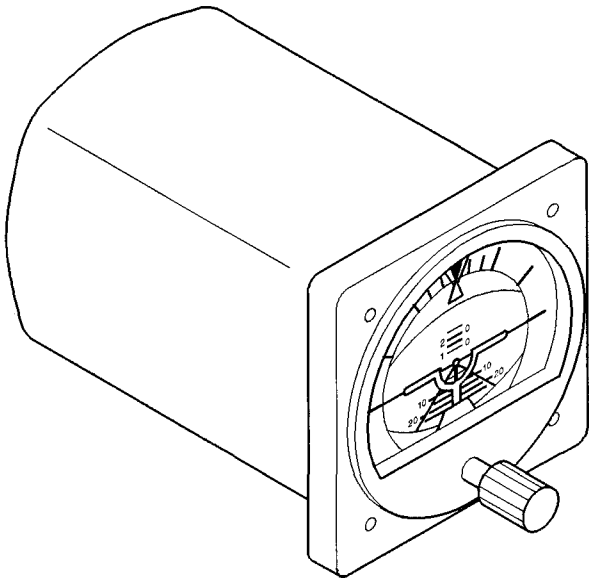
As soon as the gyroscope has reached its operating speed, the indicator is ready to correctly display the aircraft pitch and roll angles.

A - Horizon gyro indicator



Variante de localisation
Alternate location

A

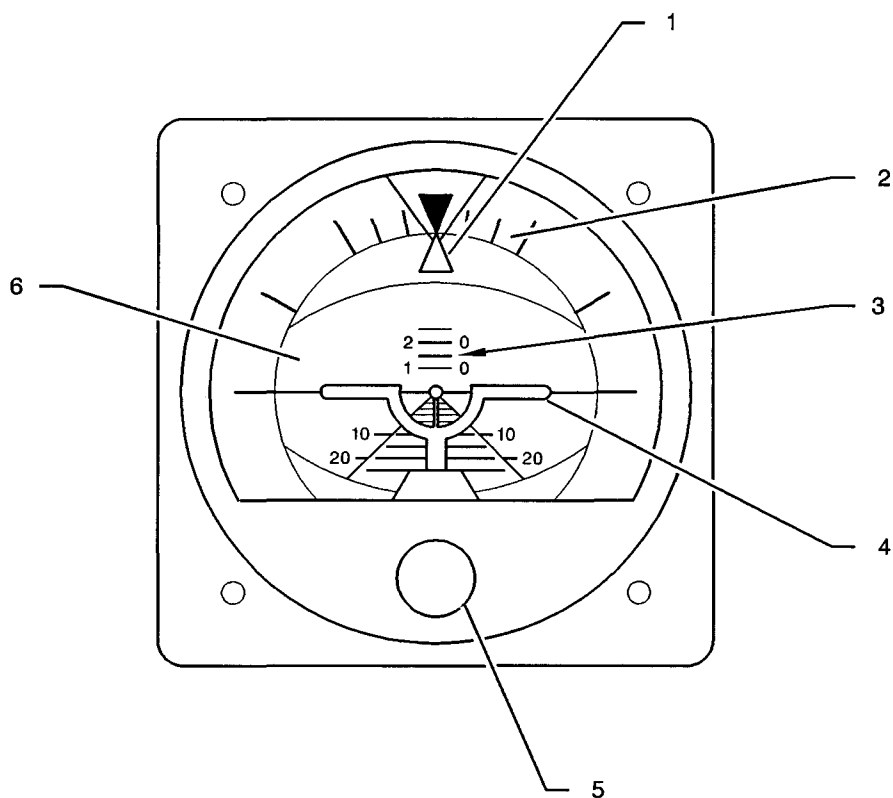


I4342400AAACVZ4101

ADI and standby horizon - Identification and location of components
Figure 1

AGAC
Validity : ADI 1
- Air-driven, Stand alone

- 1 - Lubber line
- 2 - Roll scale
- 3 - Pitch scale
- 4 - Aircraft symbol
- 5 - Adjustment knob (depending on version)
- 6 - Horizon bar



14342400AAACVZ14000

ADI and standby horizon - Horizon gyro indicator
Figure 2

AGAC

Validity : ADI 1
- Air-driven, Stand alone

34-24-00 (CE)

Page 3
FEB 00

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ADI AND STANDBY HORIZON

DESCRIPTION AND OPERATION

1. GENERAL

The optional horizon is a piloting gyroscopic instrument supplying a permanent visual indication of the aircraft pitch and roll attitude with regard to the place vertical line.

The system is composed of an electric horizon gyro (ADI) that can be of different types.

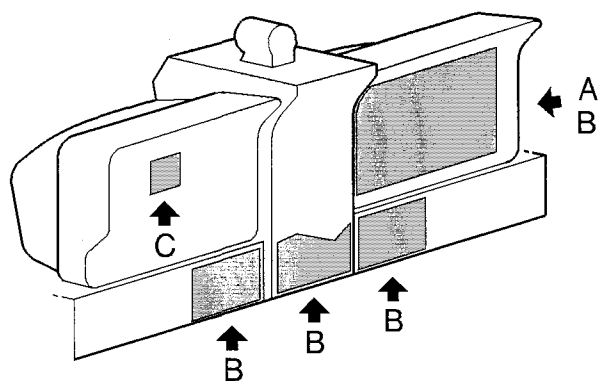
ADI 1 is used as main horizon whereas ADI 2 is used as additional horizon.

A switch marked "HORIZ" or "HORIZON" controls the operation of the electric horizon gyro.

The electric horizon gyro is electrically supplied by "BUS 3" bar or "BUS 1" bar via the "HOR" circuit breaker.

2. LOCATION (Figure 1)

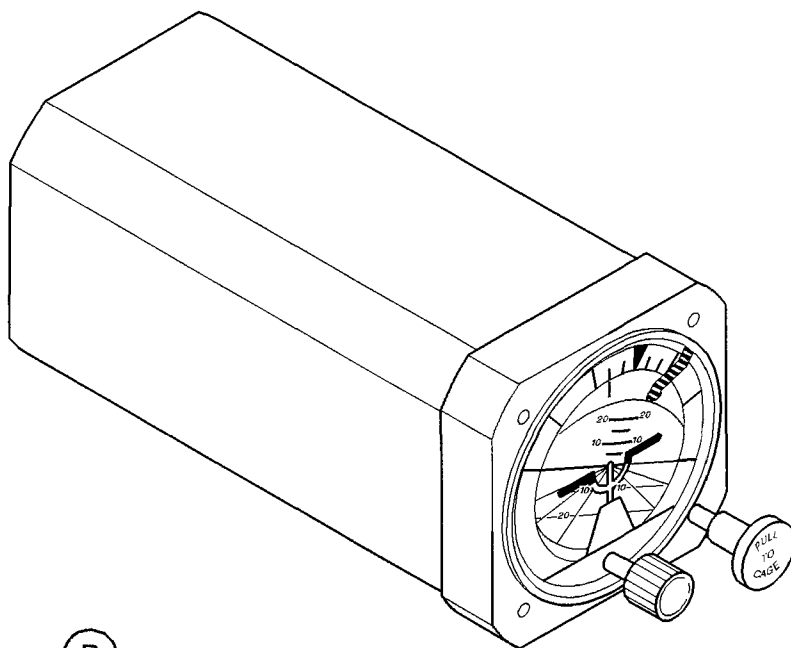
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Electric horizon gyro	1	251R/251L	/	/
"HORIZ" or "HORIZON" switch	1	250	/	/
Circuit breaker : - "HOR"	1	230	232L	WM



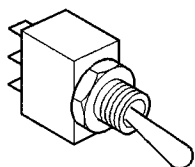
- A - Electric horizon gyro (ADI 2)
- B - "HORIZ" or "HORIZON" switch
- C - Electric horizon gyro (ADI 1)

 Variante de localisation
Alternate location

(A)



(B)



14342400AAACVZ4002

ADI and standby horizon - Identification and location of components
Figure 1

3. DESCRIPTION

A. Electric horizon gyro (Figure 2)

The electric horizon gyro provides the pilot with a visual display of aircraft attitude. This instrument can also show banking information when the aircraft is turning (instrument equipped with slip indicator).

All connections to the equipment are made through a single 4-pin connector on the back panel.

The front panel consists of :

- an aircraft symbol
- an adjustment knob which allows to move aircraft symbol (option),
- a "PULL TO CAGE" knob which allows to manually erect the rotor,
- a warning flag, which indicates rotor low speed or low input power,
- a slip indicator (depending on version).

The aircraft attitude is given by the horizon bar linked to the gyroscope and the adjustable aircraft symbol fixed on the case.

The angular value of the aircraft in roll attitude is indicated by the lubber line and the circular roll scale. The angular value of the aircraft in pitch attitude is indicated by the aircraft symbol and the horizon bar pitch scale.

B. Electric horizon gyro (Figure 2A)

The electric horizon gyro provides the pilot with a visual display of aircraft attitude.

All connections to the equipment are made through a single 4-pin connector on the back panel.

The front panel consists of :

- an aircraft symbol which can be moved using an adjustment knob,
- a "PULL TO CAGE" knob which allows to manually erect the rotor,
- a labelled "OFF" warning flag, which indicates rotor low speed or low input power.

The aircraft attitude is given by the horizon bar linked to the gyroscope and the adjustable aircraft symbol fixed on the case.

The angular value of the aircraft in roll attitude is indicated by the lubber line and the circular roll scale.

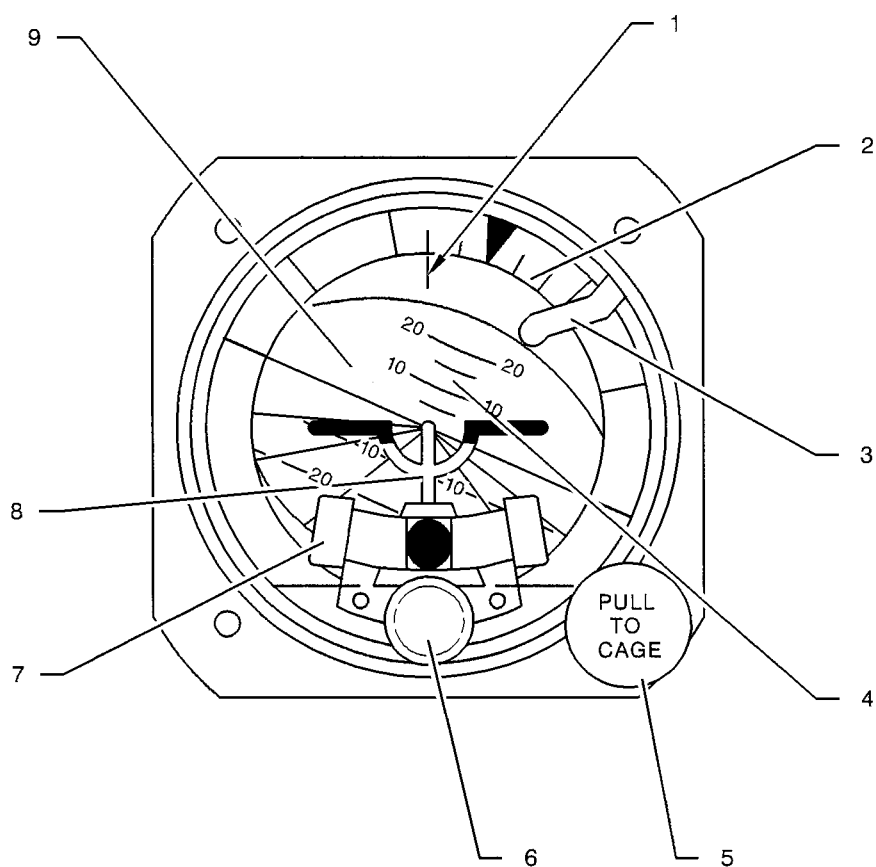
4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

The electric horizon gyro energization is carried out by setting the "HORIZ" or "HORIZON" switch to ON. The warning flag disappears when the gyroscope rotor reaches its operating speed.

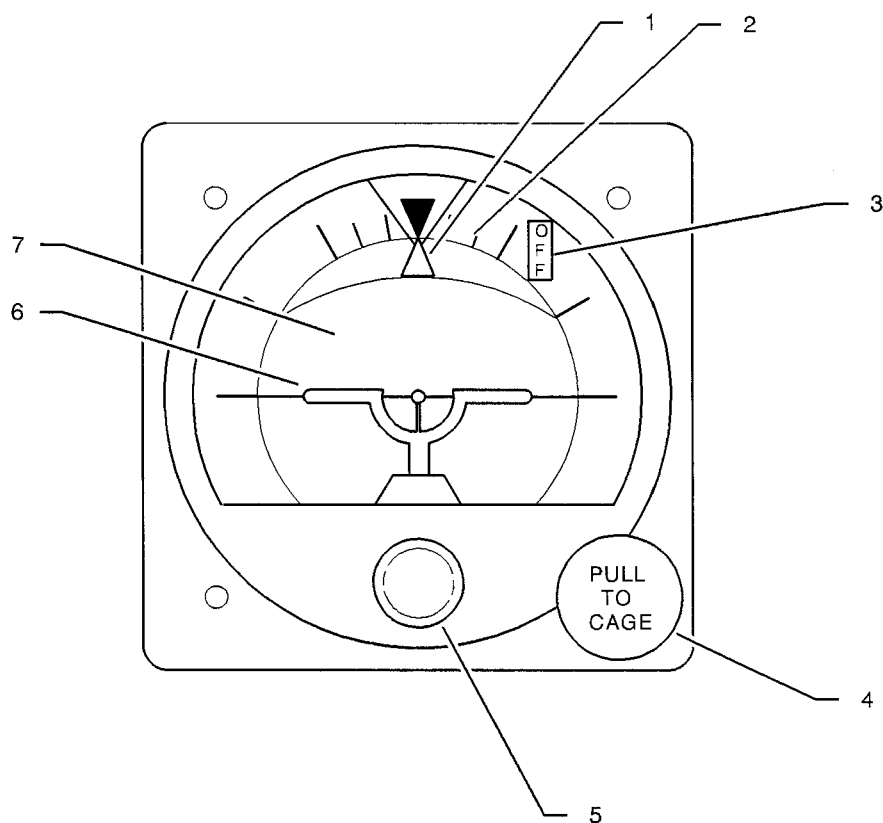
The gyroscope is manually erected by pulling the knob located in the front panel. The electric horizon is ready to correctly display the aircraft pitch and roll angles.

- 1 - Lubber line
- 2 - Roll scale
- 3 - Warning flag
- 4 - Pitch scale
- 5 - "PULL TO CAGE" knob
- 6 - Adjustment knob (option)
- 7 - Slip indicator (depending on version)
- 8 - Aircraft symbol
- 9 - Horizon bar



ADI and standby horizon - Electric horizon gyro
Figure 2

- 1 - Lubber line
- 2 - Roll scale
- 3 - Warning flag
- 4 - "PULL TO CAGE" knob
- 5 - Adjustment knob
- 6 - Aircraft symbol
- 7 - Horizon bar



14342400AAACVZ14200

ADI and standby horizon - Electric horizon gyro
Figure 2A

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ADI AND STANDBY HORIZON

DESCRIPTION AND OPERATION

1. GENERAL

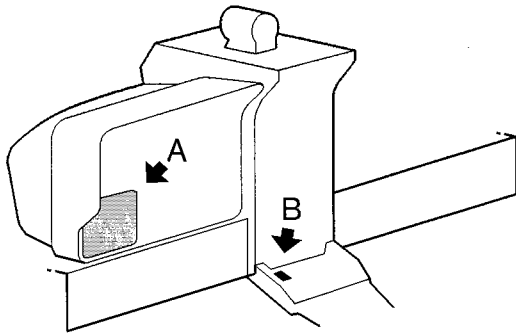
- The optional horizon is a piloting gyroscopic instrument supplying a permanent visual indication of the aircraft pitch and roll attitude with regard to the place vertical line.

The system is composed of an electric horizon gyro with slip indicator replacing the optional turn coordinator.

The electric horizon gyro is electrically supplied by "BUS 2" bar.

2. LOCATION (Figure 1)

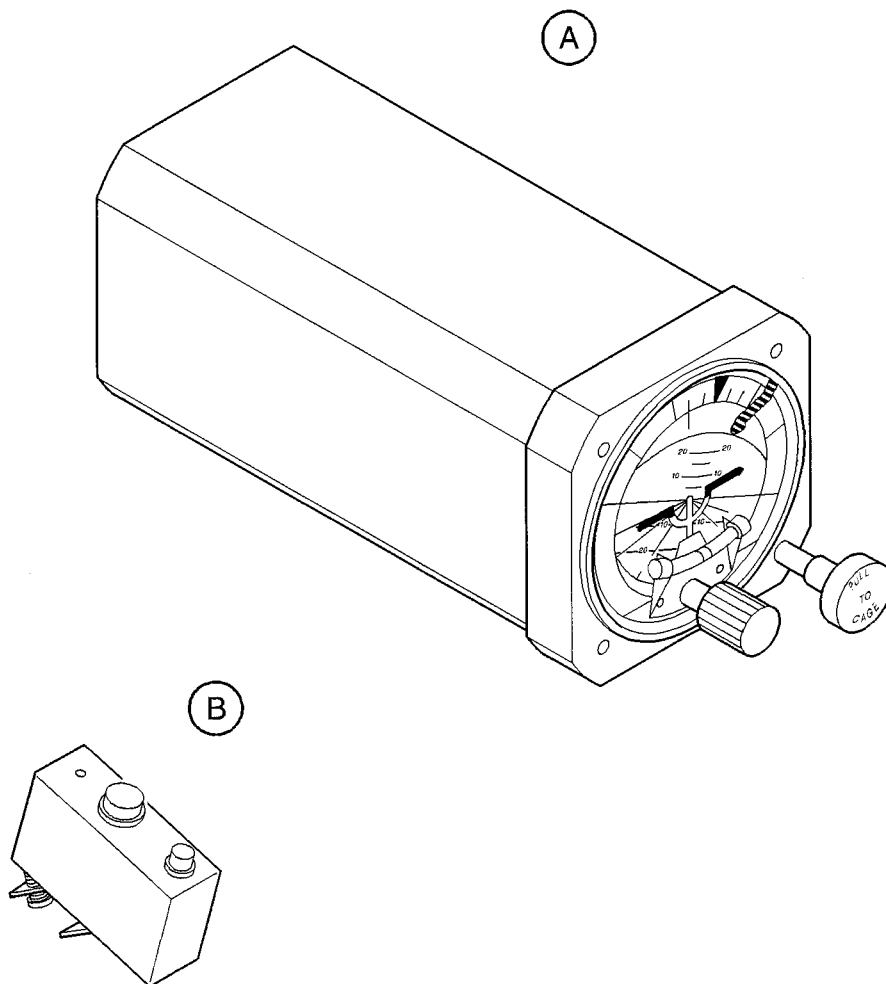
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Electric horizon gyro	1	251L	/	/
Switch-breaker : "HOR" or "⊕"	1	250	/	WM



- A - Electric horizon gyro
- B - Switch-breaker



Variante de localisation
Alternate location



14342400AAACVZ24000

ADI and standby horizon - Identification and location of components
Figure 1

3. DESCRIPTION (Figure 2)

A. Electric horizon gyro

The electric horizon gyro provides the pilot with a visual display of aircraft attitude. This instrument also shows banking information when the aircraft is turning.

All connections to the equipment are made through a single 4-pin connector on the back panel.

The front panel consists of :

- an aircraft symbol,
- an adjustment knob which allows to move aircraft symbol (option),
- a "PULL TO CAGE" knob which allows to manually erect the rotor,
- a warning flag, which indicates rotor low speed or low input power,
- a slip indicator.

The aircraft attitude is given by the horizon bar linked to the gyroscope and the adjustable aircraft symbol fixed on the case.

The angular value of the aircraft in roll attitude is indicated by the lubber line and the circular roll scale. The angular value of the aircraft in pitch attitude is indicated by the aircraft symbol and the horizon bar pitch scale.

The electric horizon gyro is electrically supplied by "BUS 2" bar controlled and protected by the switch-breaker identified by "HOR" or "⚡".

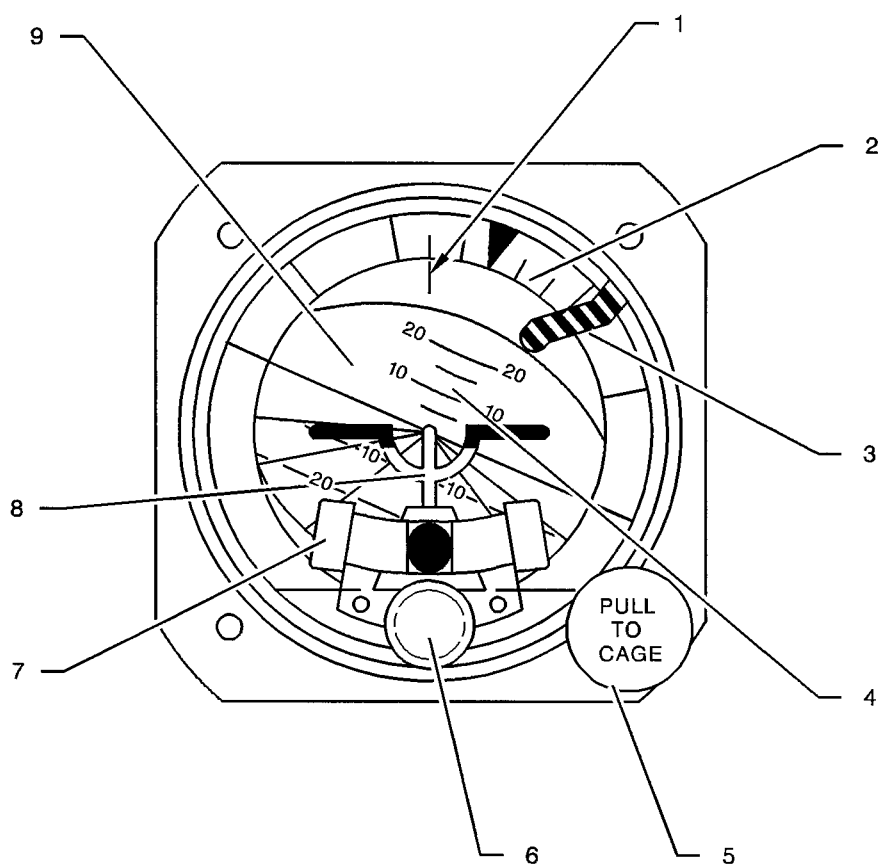
4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

The electric horizon gyro energization is carried out by means of the switch-breaker. The warning flag disappears when the gyroscope rotor reaches its operating speed.

The gyroscope is manually erected by pulling the knob located in the front panel. The electric horizon gyro is ready to correctly display the aircraft pitch and roll angles.

- 1 - Lubber line
- 2 - Roll scale
- 3 - Warning flag
- 4 - Pitch scale
- 5 - "PULL TO CAGE" knob
- 6 - Adjustment knob (option)
- 7 - Slip indicator
- 8 - Aircraft symbol
- 9 - Horizon bar



ADI and standby horizon - Electric horizon gyro
Figure 2

14342400AAACVZ14101

RADIO MAGNETIC INDICATION

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The radio magnetic indication system provides by means of one indicator, magnetic heading of the aircraft and bearing information to VOR and ADF stations.

The optional radio magnetic indication system consists of a M75 radio magnetic indicator (RMI).

The single pointer of the RMI can be switched between NAV 1 / NAV 2 installations by means of an optional S6 external switch.

The RMI receives :

- magnetic heading information from the heading reference system - refer to 34-21-00,
- navigation data from NAV 1 installation - refer to 34-51-00,
- ADF bearing information from Automatic Direction Finder (ADF) system - refer to 34-54-00,
- navigation data from NAV 2 installation (with optional S6 external switch only) - refer to 34-52-00.

The system is electrically supplied by "BUS 3" bar and protected by "RMI" fuse.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M75 radio magnetic indicator	1	251L	/	/
S6 external switch (option)	1	251L	/	/
Fuse: - "RMI"	1	250	211L	WM

3. DESCRIPTION

A. M75 radio magnetic indicator (Figure 3)

Radio Magnetic Indicator provides bearing information to VOR and ADF stations by means of two pointers. The RMI also presents the aircraft magnetic heading.

The RMI is housed into a rectangular box with all electrical connections made through a rear connector.

The equipment front panel consists of :

- a compass card rotating under a fixed lubber line,
- a single bar pointer which indicates bearing information to a VOR station,
- a double bar pointer which indicates bearing information to an ADF station,
- a fixed lubber line which indicates aircraft magnetic heading on the compass card.

The RMI is electrically supplied by "BUS 3" bar and protected by "RMI" fuse of PL3 fuse panel. The fuse panel is located on the firewall, on the L.H. side, on cabin side.

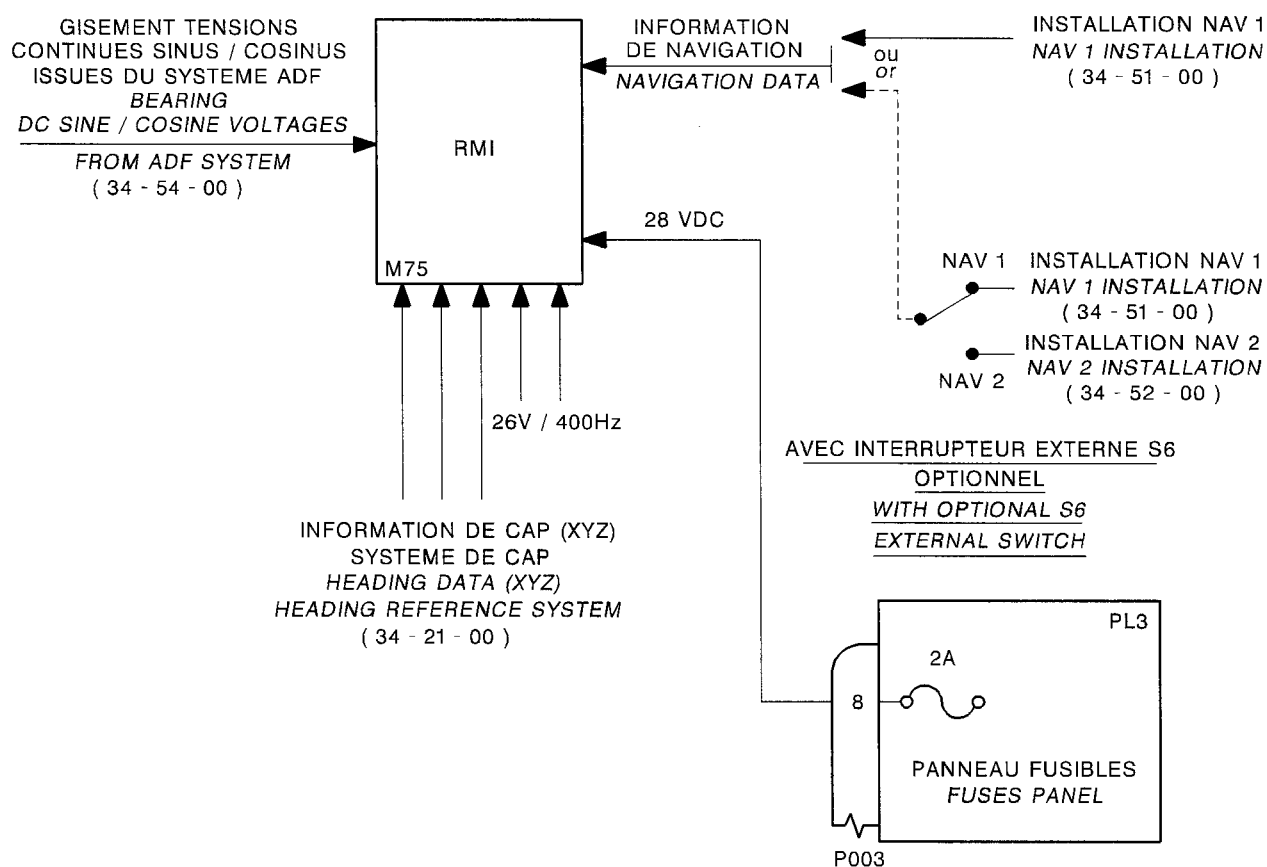
The RMI is located on L.H. instrument panel.

AAAA

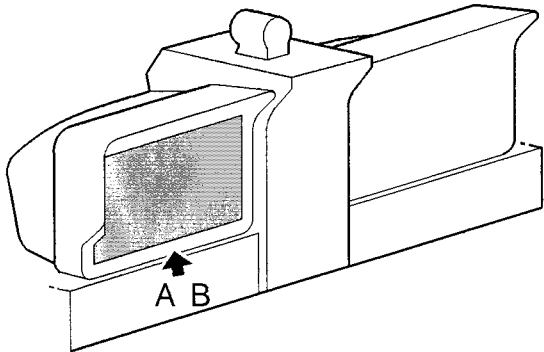
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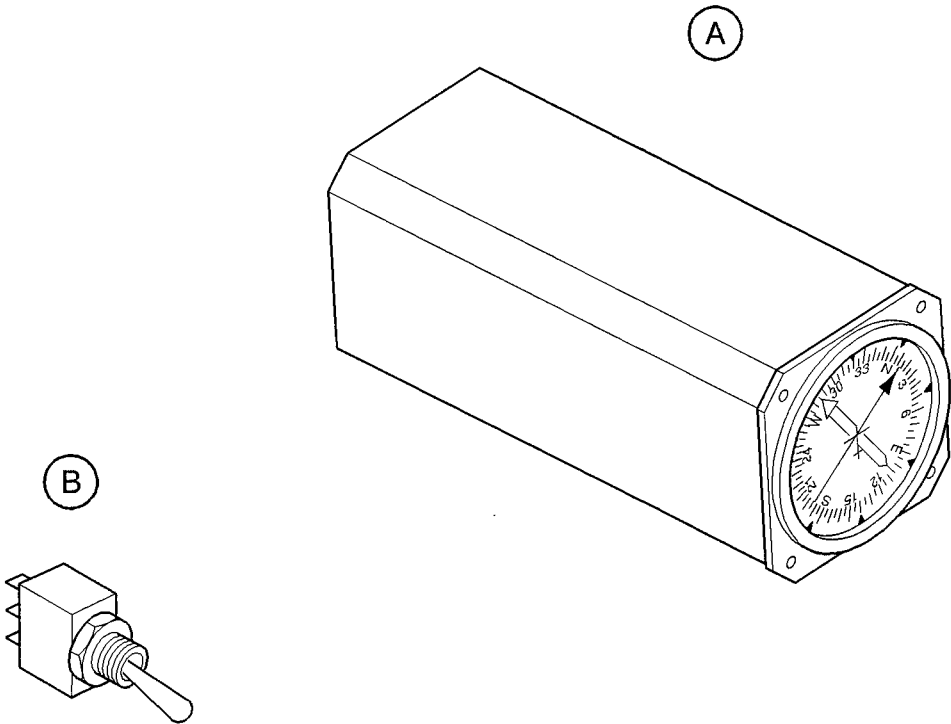
Radio magnetic indication - Electrical schematic
Figure 1



- A - M75 radio magnetic indicator
- B - S6 external switch (option)



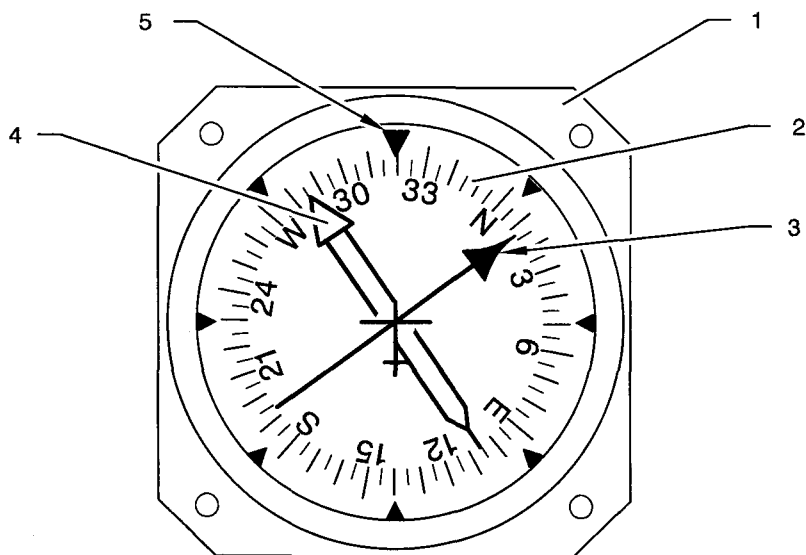
Variante de localisation
Alternate location



M342500AAAAVZ4001

Radio magnetic indication - Identification and location of components
Figure 2

- 1 - M75 radio magnetic indicator
- 2 - Compass card
- 3 - Single bar pointer (VOR)
- 4 - Double bar pointer (ADF)
- 5 - Fixed lubber line



Radio magnetic indication - M75 radio magnetic indicator
Figure 3

B. S6 external switch (option)

S6 external switch allows selecting VOR information either from NAV1 installation or from NAV2 installation. The radio magnetic indicator processes and displays the selected information by means of the single bar pointer.

4. OPERATION

The radio magnetic indicator receives a standard ARINC 3-wire synchro X, Y, Z heading information from M73 horizontal situation indicator (HSI) of heading system. The aircraft magnetic heading is read on the compass card in front of the fixed lubber line.

To display the ADF bearing information, the RMI receives DC sine/cosine format signals from A55 ADF receiver. The double bar pointer indicates magnetic heading of the ADF station. The double bar pointer is parked at 90° to the right of the fixed lubber line when the "ANT" mode is set on the A55 ADF receiver.

To display the VOR bearing information, the RMI receives signals from NAV1 installation (NAV1 or NAV2 with optional S6 external switch). The single bar pointer indicates magnetic heading of the VOR station. When VOR receiver indicates a flagged condition, the single bar pointer is parked at 90° to the right of the fixed lubber line.

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RADIO MAGNETIC INDICATION

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The radio magnetic indication system provides by means of one indicator, magnetic heading of the aircraft and bearing information to VOR and ADF stations.

The optional radio magnetic indication system consists of a radio magnetic indicator (RMI).

The radio magnetic indicator receives :

- magnetic heading information from the heading reference system - refer to 34-21-00,
- navigation data from NAV 1 installation - refer to 34-51-00,
- ADF bearing information from Automatic Direction Finder (ADF) system(s) - refer to 34-54-00,
- navigation data from NAV 2 installation - refer to 34-52-00.

The slaved directional gyro of the heading reference system in conjunction with an external resistor provides a heading flag signal to the radio magnetic indicator. The resistor is fixed :

- either onto a terminal bar which is mounted onto the slaved directional gyro support,
- or directly onto R.H. vertical side of the slaved directional gyro support (inner side).

The system is electrically supplied by "BUS 3 " bar.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Radio magnetic indicator (RMI)	1	251L	/	/
Resistor	1	220	219 and 242	/
Fuse: - "RMI"	1	250	211L	WM

3. DESCRIPTION (Figure 3)

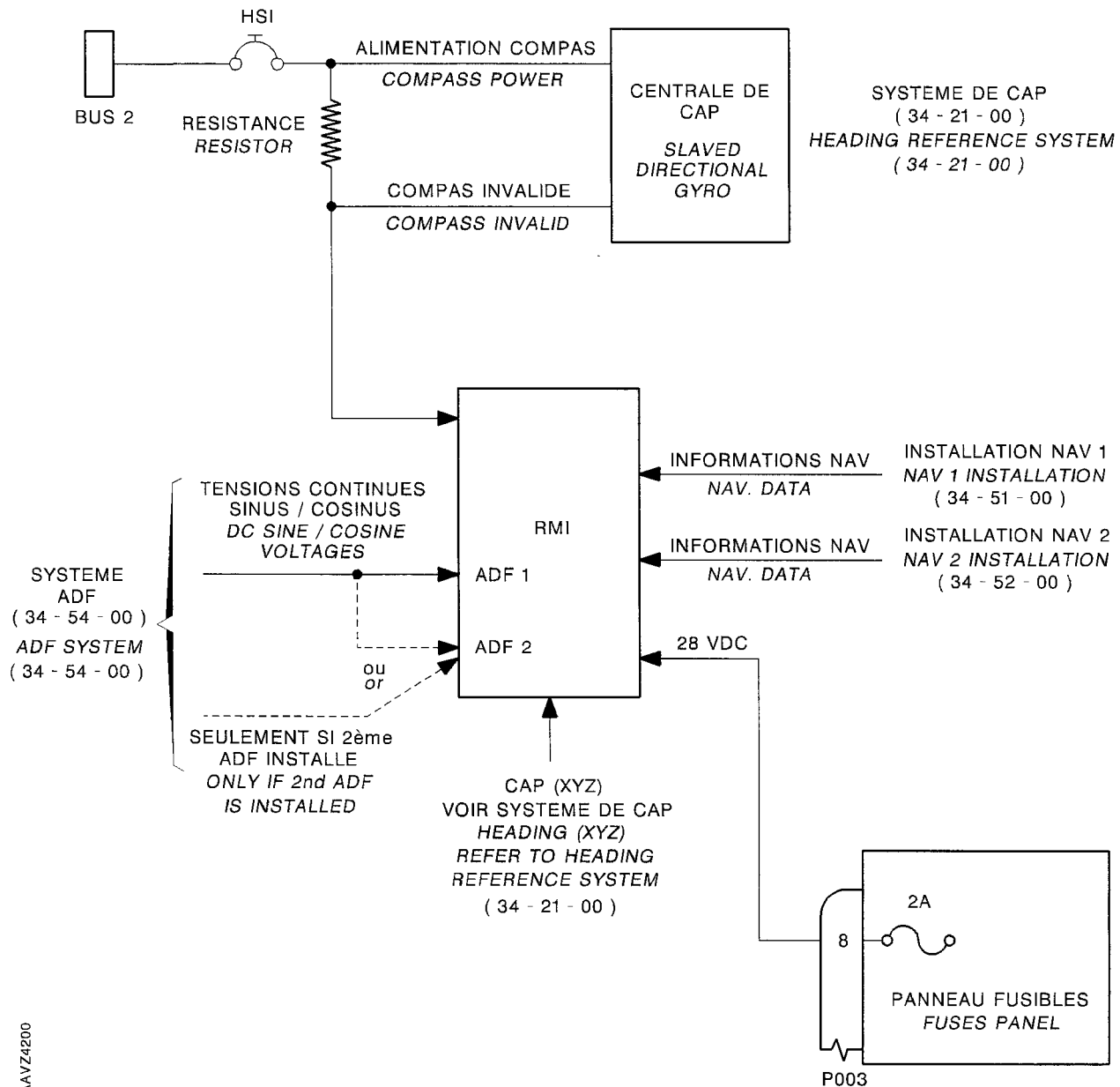
A. Radio magnetic indicator (RMI)

Radio magnetic indicator provides bearing information to VOR or ADF stations by means of two pointers. It also presents the aircraft magnetic heading.

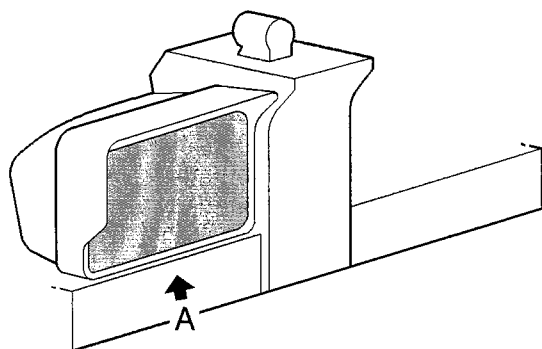
The radio magnetic indicator is housed into a rectangular box with all electrical connections made through a 50-pin rear connector.

The equipment front panel consists of :

- a compass card rotating under a fixed lubber line,
- a single bar pointer which indicates bearing information to a VOR or ADF station depending on the position of the pushbutton on front L.H. panel,
- a double bar pointer which indicates bearing information to an ADF or VOR station depending on the position of the pushbutton on front R.H. panel,



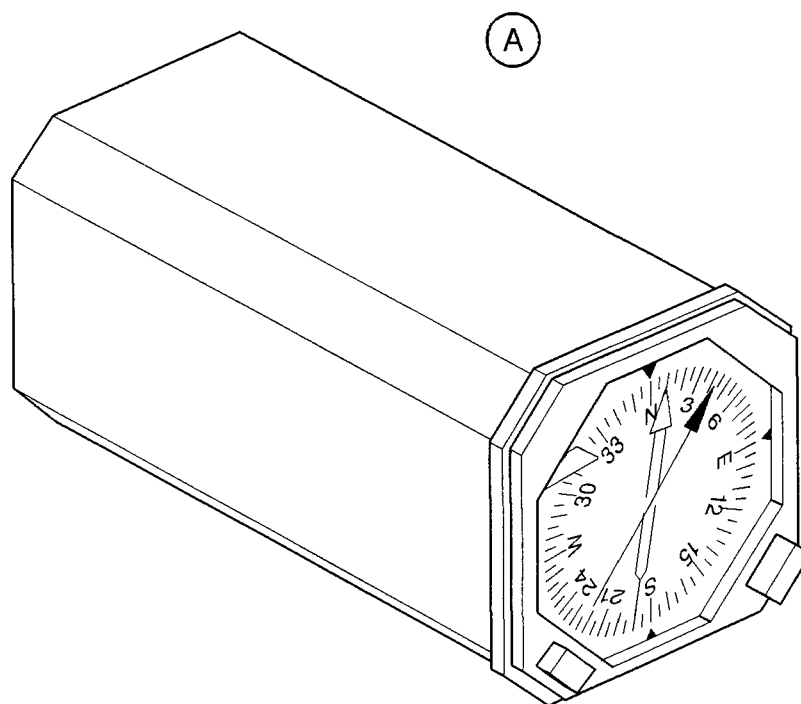
Radio magnetic indication - Electrical schematic
Figure 1



A - Radio magnetic indicator (RMI)



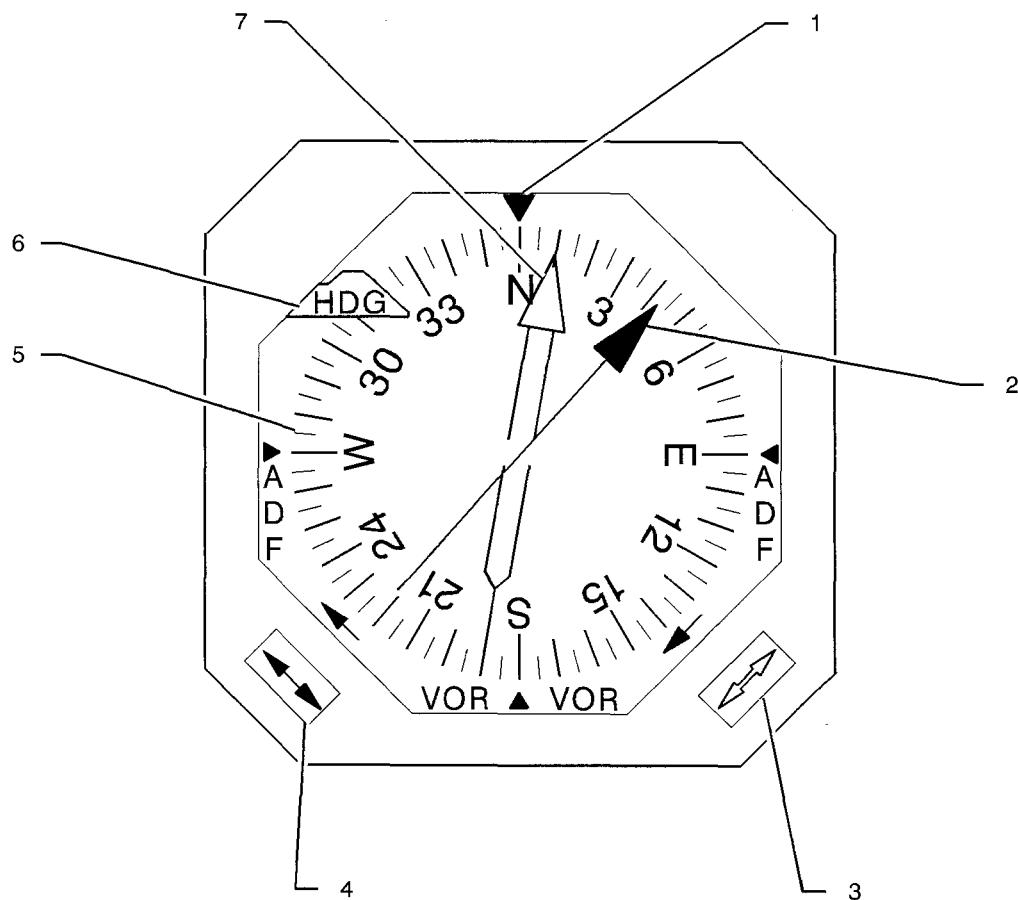
Variante de localisation
Alternate location



14342500AAAVZ14000

Radio magnetic indication - Identification and location of components
Figure 2

- 1 - Fixed lubber line
- 2 - Single bar pointer
- 3 - ADF/VOR or ADF/NAV pushbutton
- 4 - ADF/VOR or ADF/NAV pushbutton
- 5 - Compass card
- 6 - "HDG" flag
- 7 - Double bar pointer



14345400AA\HMA4000

Radio magnetic indication - Radio magnetic indicator
Figure 3

- a "HDG" flag which indicates the reliability of the heading system. The flag comes into view if the heading system fails to provide correct heading information.
- a fixed lubber line which indicates aircraft magnetic heading on the compass card.

The radio magnetic indicator is electrically supplied by "BUS 3" bar and protected by "RMI" fuse of PL3 fuse panel.

The radio magnetic indicator is located on L.H. instrument panel.

4. OPERATION

The radio magnetic indicator receives a standard ARINC 3-wire synchro X, Y, Z heading information from M73 horizontal situation indicator (HSI) of heading system. The aircraft magnetic heading is read on the compass card in front of the fixed lubber line.

On the radio magnetic indicator, when ADF/VOR or ADF/NAV mode pushbuttons are pushed in :

- the single and the double bar pointers indicate the magnetic heading to the ADF station selected on A55 ADF receiver.

Single and double bar pointers are parked at 90° to the right of the fixed lubber line when the "ANT" mode is set on ADF receiver.

When ADF/VOR or ADF/NAV mode pushbuttons are released :

- the single bar pointer indicates the magnetic heading of the selected VOR station on the NAV receiver of the NAV 1 installation,
- the double bar pointer indicates the magnetic heading of the selected VOR station on the NAV receiver of the NAV 2 installation.

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**LANDING AND TAXIING AIDS
DESCRIPTION AND OPERATION**

1. GENERAL

This section describes the systems which provide guidance during approach, landing and taxiing.

2. DESCRIPTION

A. MARKER system - refer to 34-31-00

This section describes the MARKER system which provides accurate information to the pilot when he flies over beacons.

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MARKER

DESCRIPTION AND OPERATION

1. GENERAL

The markers are ground beacons which transmit a narrow vertical beam. They are generally associated to the ILS (Instrument Landing System) and are three. They provide the threshold distance. The marker receiver indicates to the pilot, by an appropriate luminous and sound signal, that the aircraft flies over a beacon.

The optional marker system consists of :

- an MKR receiver / indicator integrated into A50 audio control box – refer to 23-11-00,
- an E38 MKR antenna,
- a notch filter tee (if installed).

The MKR receiver / indicator transmits "OUTER MKR" and "MIDDLE MKR" information to the optional autopilot – refer to 22-12-00.

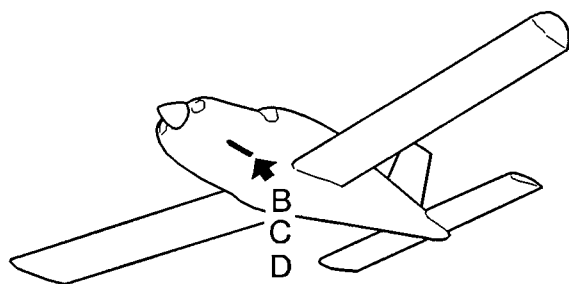
The MKR receiver / indicator is electrically supplied by "BUS 3" bar via the "AUDIO" circuit breaker.

2. LOCATION (Figures 1 and 1A)

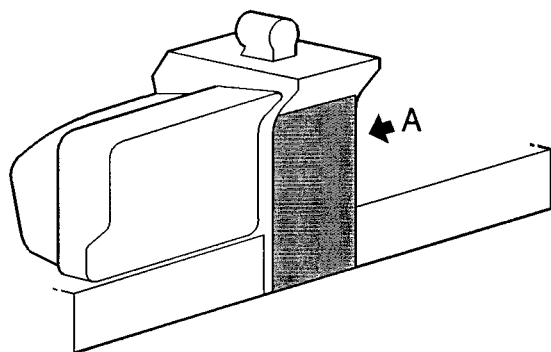
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A50 audio control box	1	251C	/	/
E38 MKR antenna	1	210	214	/
Notch filter tee (if installed)	1	210	214	/
Circuit breaker : - "AUDIO"	1	230	232L	WM

3. OPERATION

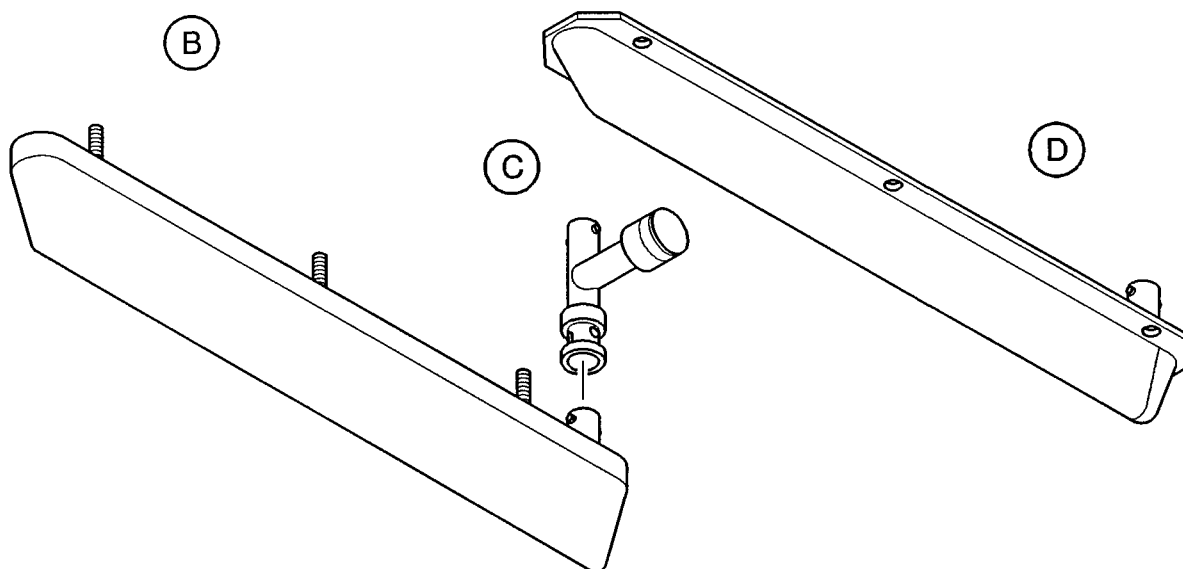
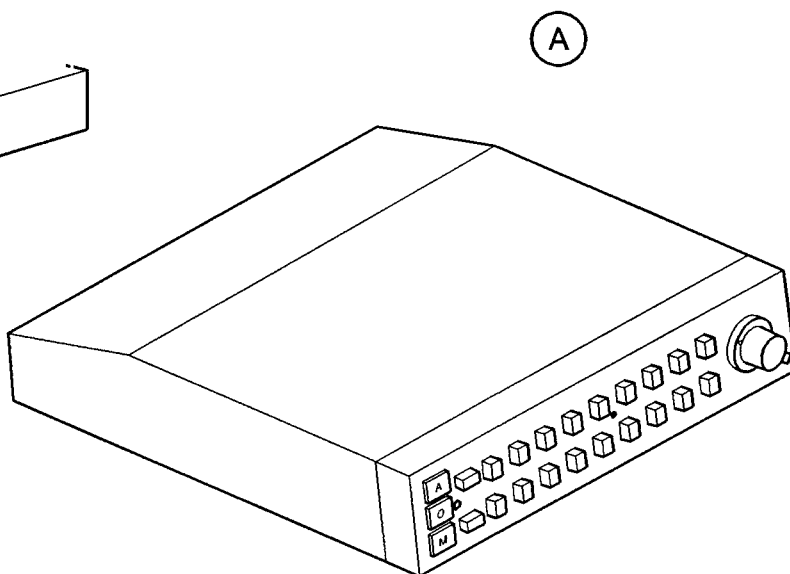
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



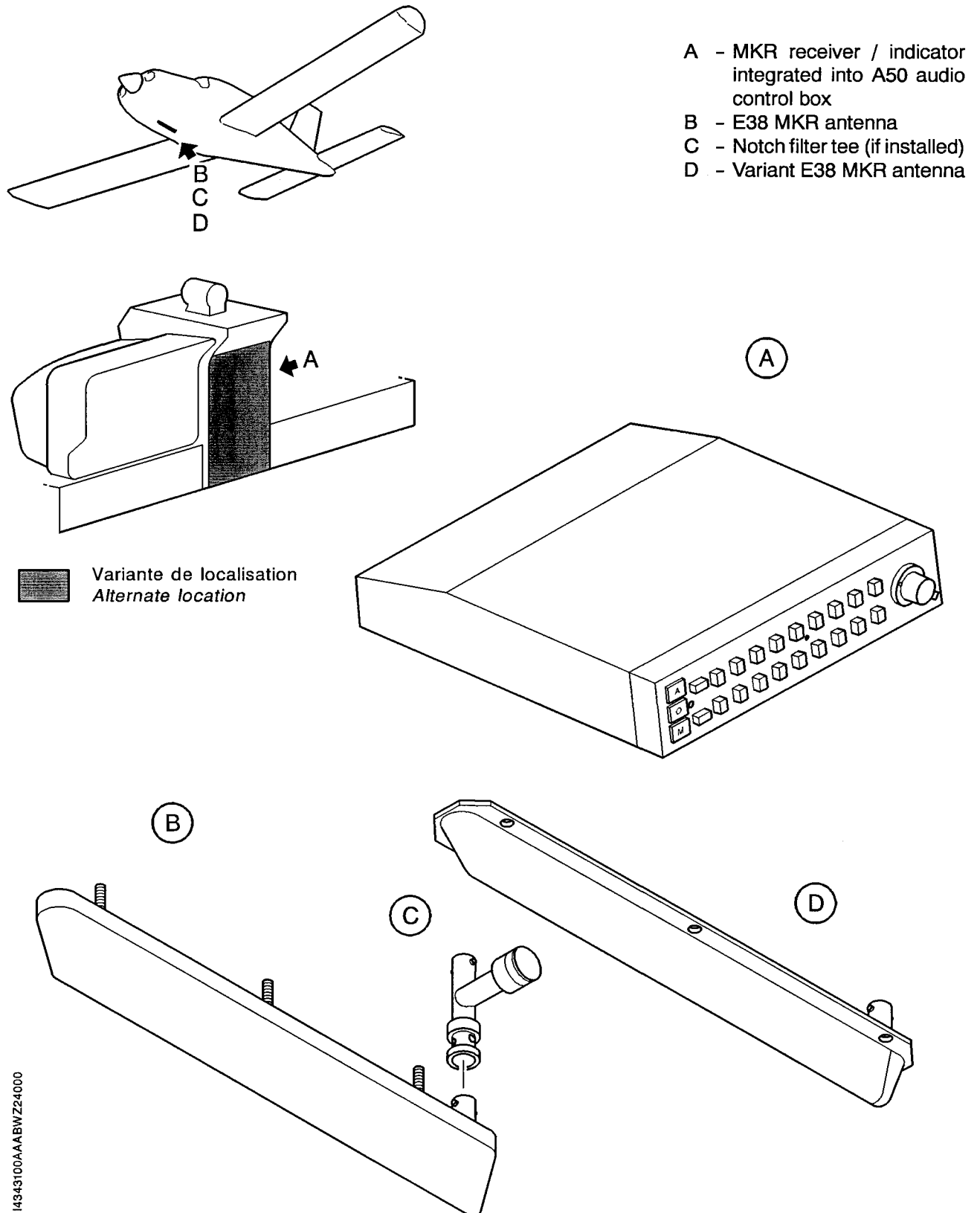
- A - MKR receiver / indicator integrated into A50 audio control box
- B - E38 MKR antenna
- C - Notch filter tee (if installed)
- D - Variant E38 MKR antenna



■ Variante de localisation
Alternate location



MARKER - Identification and location of components
Figure 1 - TB 9, 10, 200, 20



MARKER - Identification and location of components
Figure 1A - TB 21

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MARKER

DESCRIPTION AND OPERATION

1. GENERAL

The markers are ground beacons which transmit a narrow vertical beam. They are generally associated to the ILS (Instrument Landing System) and are three. They provide the threshold distance. The marker receiver indicates to the pilot, by an appropriate luminous and sound signal, that the aircraft flies over a beacon.

The optional marker system consists of :

- an M78 MKR receiver / indicator,
- an E38 MKR antenna.

The MKR receiver / indicator sends an audio signal to the audio control box - refer to 23-11-00.

The MKR receiver / indicator transmits "OUTER MKR" and "MIDDLE MKR" information to the optional autopilot - refer to 22-12-00.

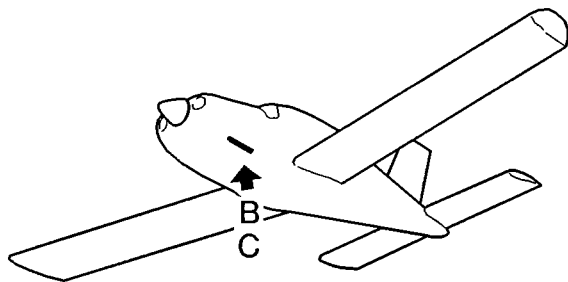
The MKR receiver / indicator is electrically supplied by "BUS 3" bar via the "AUDIO" circuit breaker.

2. LOCATION (Figures 1 and 1A)

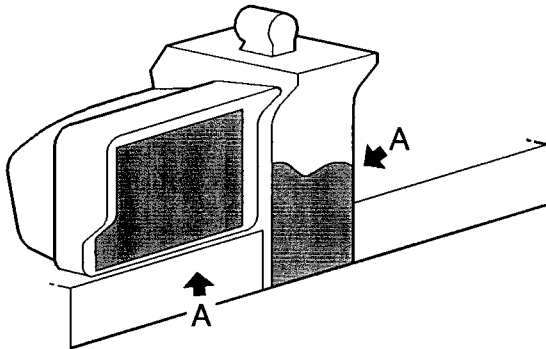
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M78 MKR receiver / indicator	1	250	/	/
E38 MKR antenna	1	210	214	/
Circuit breaker : - "AUDIO"	1	230	232L	WM

3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

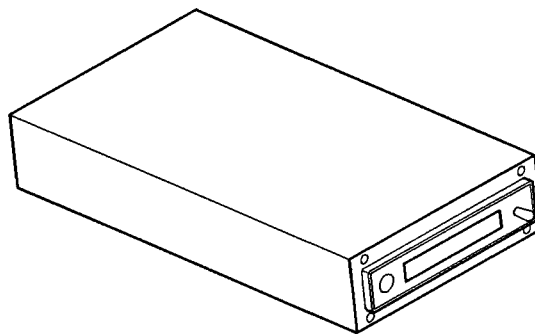


- A - M78 MKR receiver / indicator
- B - E38 MKR antenna
- C - Variant E38 MKR antenna

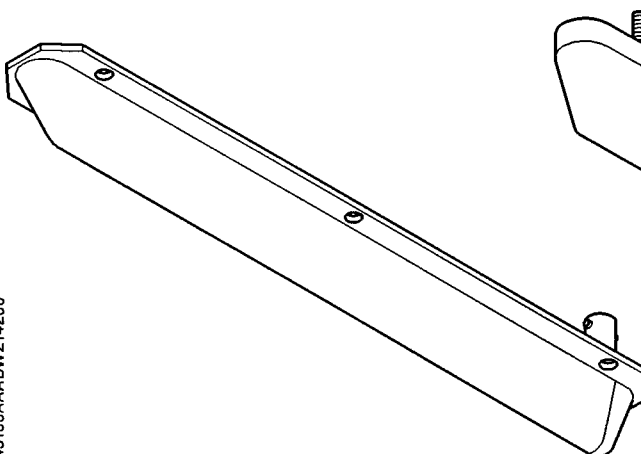


Variante de localisation
Alternate location

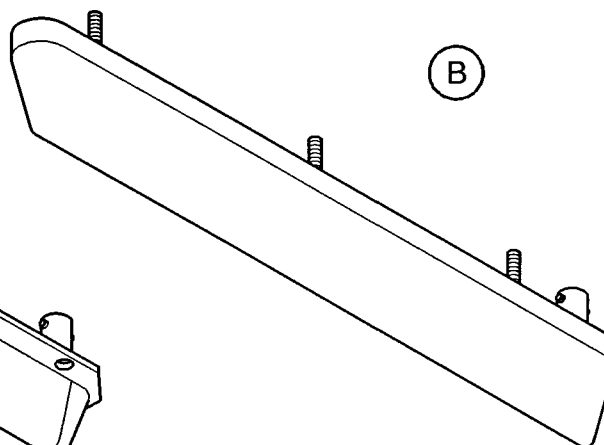
(A)



(C)

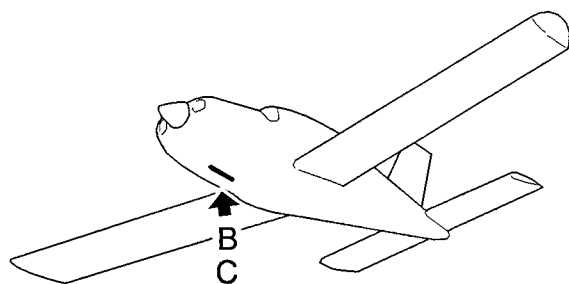


(B)

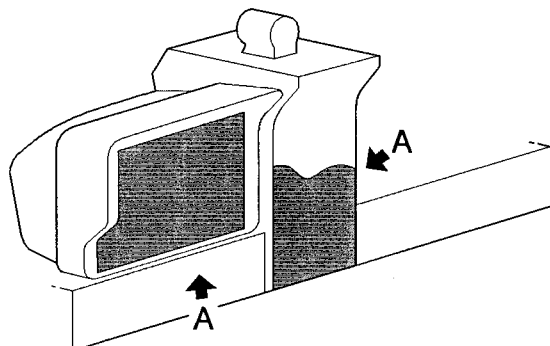


14343100AAABWZ14200

MARKER - Identification and location of components
Figure 1 - TB 9, 10, 200, 20

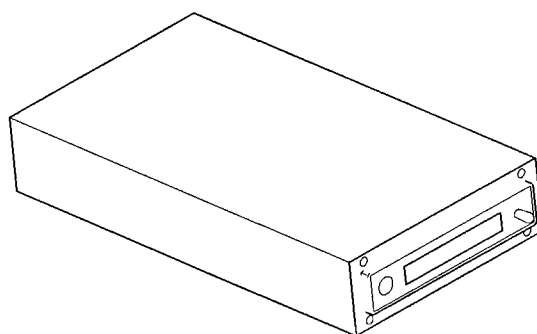


- A - M78 MKR receiver / indicator
- B - E38 MKR antenna
- C - Variant E38 MKR antenna

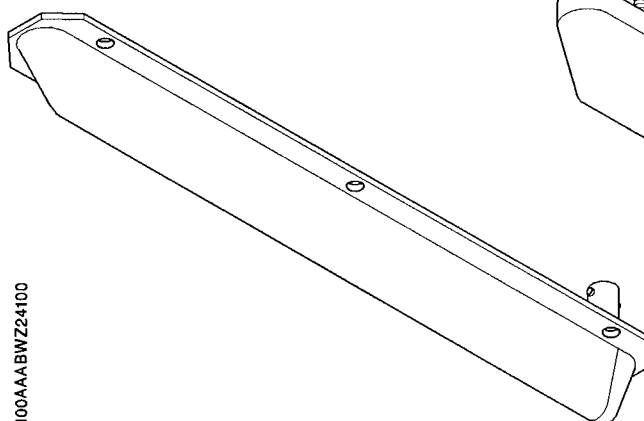


 Variante de localisation
Alternate location

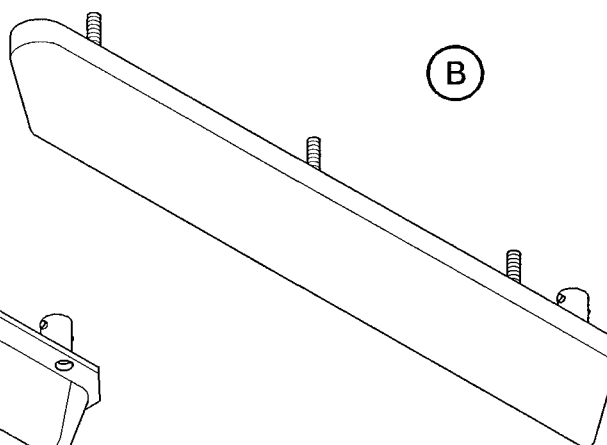
(A)



(C)



(B)



I4343100AAA BWZ24100

MARKER - Identification and location of components
Figure 1A - TB 21

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MARKER**DESCRIPTION AND OPERATION****1. GENERAL**

The markers are ground beacons which transmit a narrow vertical beam. They are generally associated to the Instrument Landing System (ILS). The three markers provide the threshold distance. The marker beacon receiver informs the pilot by means of visual and audio signals that the aircraft is flying over a beacon.

The system consists of :

- a marker receiver incorporated into A50 audio control panel,
- E38 marker antenna.

The marker receiver sends data to :

- A82 flight computer of the autopilot system (option) - refer to 22-12-00,

The marker system is electrically supplied by "BUS 1" bar.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A50 audio control panel	1	251C	/	23-10-00
E38 marker antenna	1	214	/	34-31-00
Circuit breaker : - CB 84 "AUDIO"	1	PL 1	/	WM

3. DESCRIPTION**A. A50 audio control panel (Figure 2)**

The marker receiver receives the signal detected by the antenna when the aircraft is flying over a ground beacon. Once the receiver has processed the signal, it provides a visual information and the associated audio signal.

It is incorporated into A50 audio control panel.

The rear face of A50 audio control panel features an electrical connector onto which the antenna cable is also connected.

The front face features :

- a three-position mode selector (1) :
 - "High" (High sensitivity) position : the gain of the receiver input stage is increased thus enabling weaker signals to be received,
 - "Low" (Low sensitivity) position : the receiver sensitivity is decreased,
 - "Test" position : test function,
- three indicator lights (2). Each indicator light has a marking engraved on a cover of a different color. The illumination of the lamp located inside each section indicates to the pilot that the ground beacon has been flown over.

The marker receiver is electrically supplied by "BUS 1" bar and protected by CB 84 "AUDIO" circuit breaker.

The marker receiver is mounted on PL30 radio rack.

B. E38 marker antenna

Marker antenna is an horizontally-polarized aerial used for omnidirectional reception of 75-MHz VHF signals.

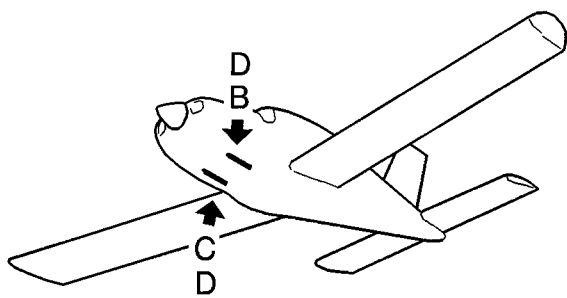
It is a low profile antenna 14.6 inch (37 cm) long. It is secured under the fuselage on the R.H. or L.H. side between C0 and C1 frames.

4. OPERATION

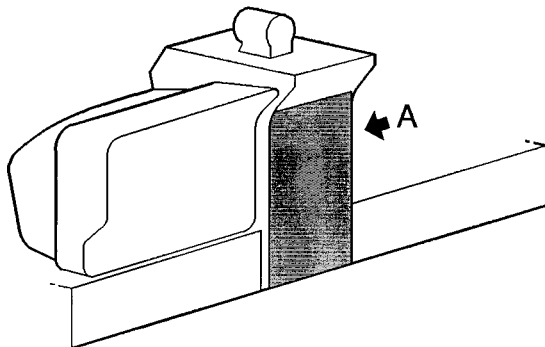
The "RADIO MASTER" switch enables the system to be energized.

When the aircraft crosses the beam of a ground beacon transmitter, the marker receiver receives the signal detected by the antenna. Once the useful signal of the carrier wave has been extracted, the marker receiver provides the pilot with a visual indication of the appropriate color. The associated audio signal triggers.

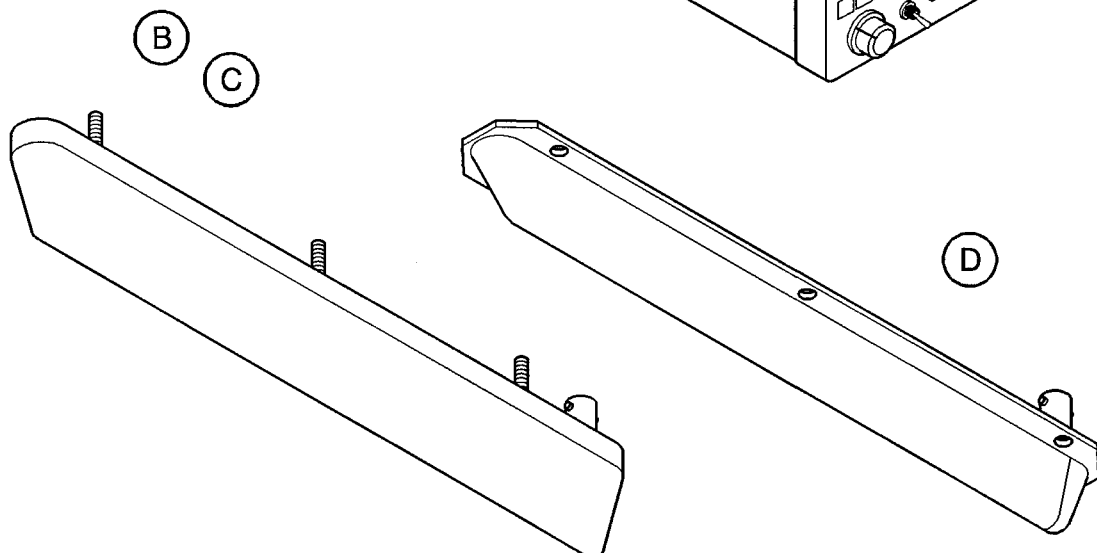
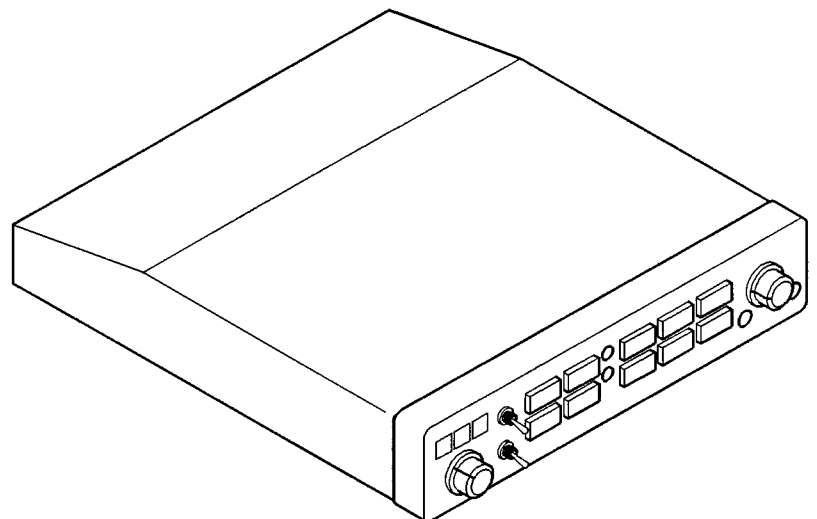
Holding the mode selector in the "Test" position triggers a simultaneous test of the three indicator lights of the marker receiver.



- A - A50 audio control panel
- B - E38 marker antenna
TB 9, 10, 200, 20
- C - E38 marker antenna
TB 21
- D - E38 marker antenna (Variant)



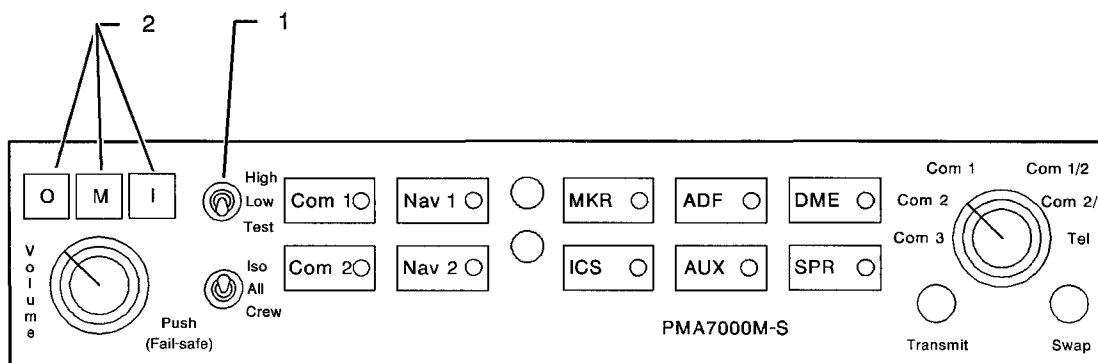
 Variante de localisation
Alternate location



Marker - Identification and location of components
Figure 1

14343100AAAGVZ4000

- 1 - Mode selector
- 2 - Indicator lights



Marker - A50 audio control panel
Figure 2

14231100AAAUVZ14000

MARKER

DESCRIPTION AND OPERATION

1. GENERAL

The markers are ground beacons which transmit a narrow vertical beam. They are generally associated to the Instrument Landing System (ILS). The three markers provide the threshold distance. The marker beacon receiver informs the pilot by means of visual and audio signals that the aircraft is flying over a beacon.

The system consists of :

- a marker receiver incorporated into A50 audio control panel,
- E38 marker antenna.

The marker system is electrically supplied by "BUS 1" bar.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A50 audio control panel	1	251C	/	23-10-00
E38 marker antenna	1	214	/	34-31-00
Circuit breaker : - CB 84 "AUDIO"	1	PL 1	/	WM

3. DESCRIPTION

A. A50 audio control panel (Figure 2)

The marker receiver receives the signal detected by the antenna when the aircraft is flying over a ground beacon. Once the receiver has processed the signal, it provides a visual information and the associated audio signal.

It is incorporated into A50 audio control panel.

The front face features :

- a "SENS" pushbutton (1) to select marker receiver sensitivity
- two LED type "HI", "LO" indicator lights (3) to indicate sensitivity choice. When "HI" indicator light illuminates, the gain of the receiver input stage is increased thus enabling weaker signals to be received. When "LO" indicator light illuminates, the receiver sensitivity is decreased.
- a "MKR MUTE" pushbutton (4) to select marker output.
- three MKR indicator lights (5). Each indicator light has a marking engraved on a cover of a different color. The illumination of the lamp located inside each section indicates to the pilot that the ground beacon has been flown over.
- a "TEST" pushbutton (2) to check, on front panel, LED type indicator lights and MKR indicator lights.

The marker receiver is electrically supplied by "BUS 1" bar and protected by CB 84 "AUDIO" circuit breaker.

The marker receiver is mounted on PL30 radio rack.

B. E38 marker antenna

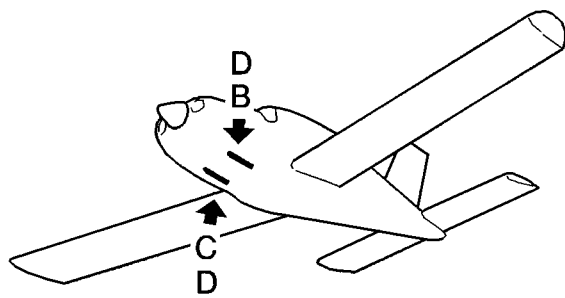
Marker antenna is an horizontally-polarized aerial used for omnidirectional reception of 75-MHz VHF signals.

It is a low profile antenna 14.6 inch (37 cm) long. It is secured under the fuselage on the R.H. or L.H. side between C0 and C1 frames.

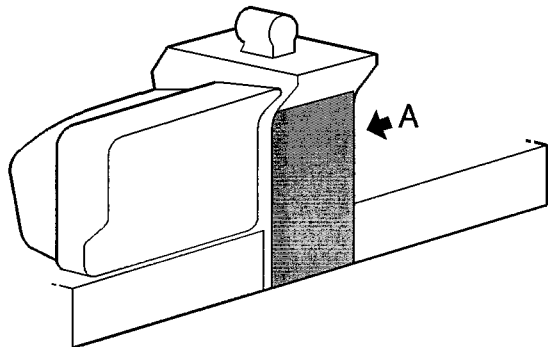
4. OPERATION

When the aircraft crosses the beam of a ground beacon transmitter, the marker receiver receives the signal detected by the antenna. Once the useful signal of the carrier wave has been extracted, the marker receiver provides the pilot with a visual indication of the appropriate color. The associated audio signal triggers.

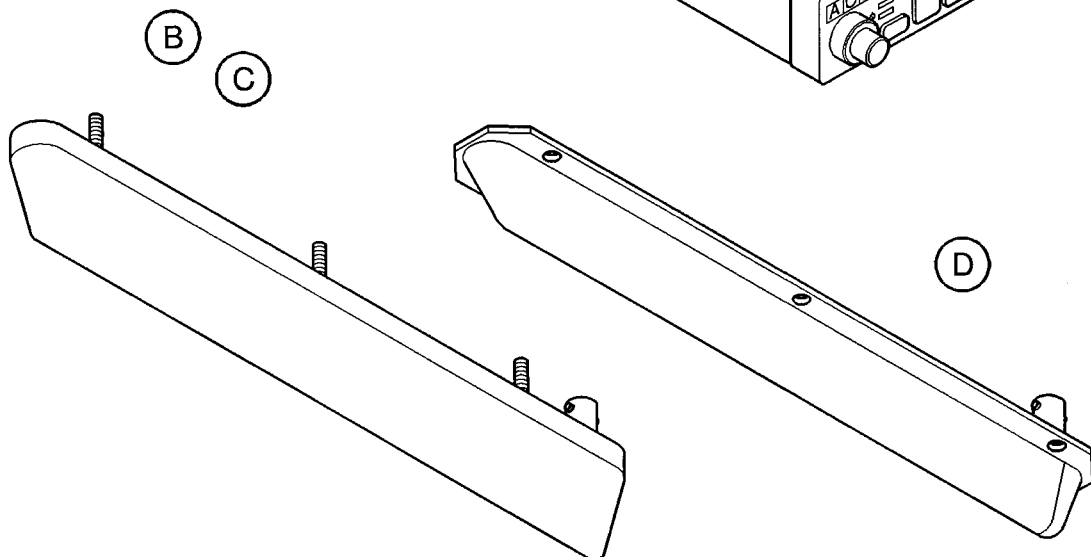
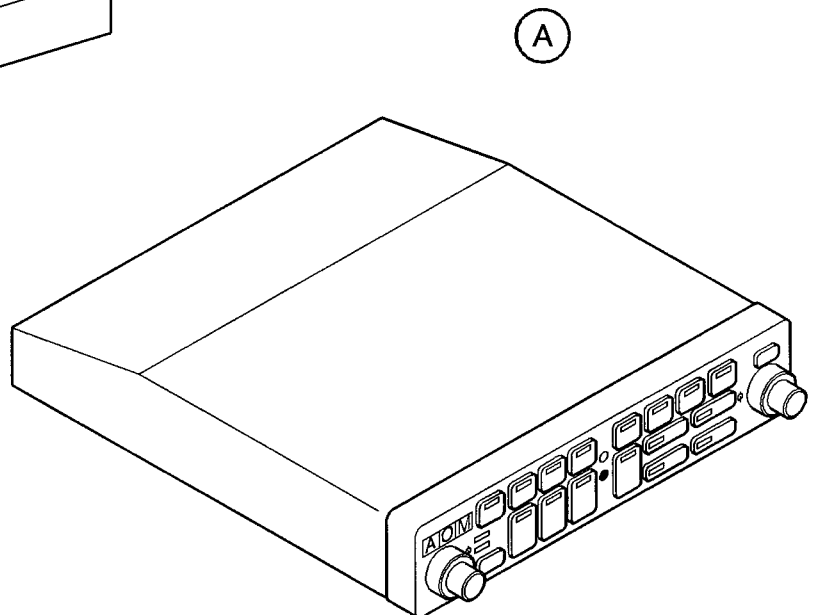
Actuating "TEST" pushbutton triggers a simultaneous test of the three indicator lights of the marker receiver.



- A - A50 audio control panel
- B - E38 marker antenna
TB 9, 10, 200, 20
- C - E38 marker antenna
TB 21
- D - E38 marker antenna (Variant)



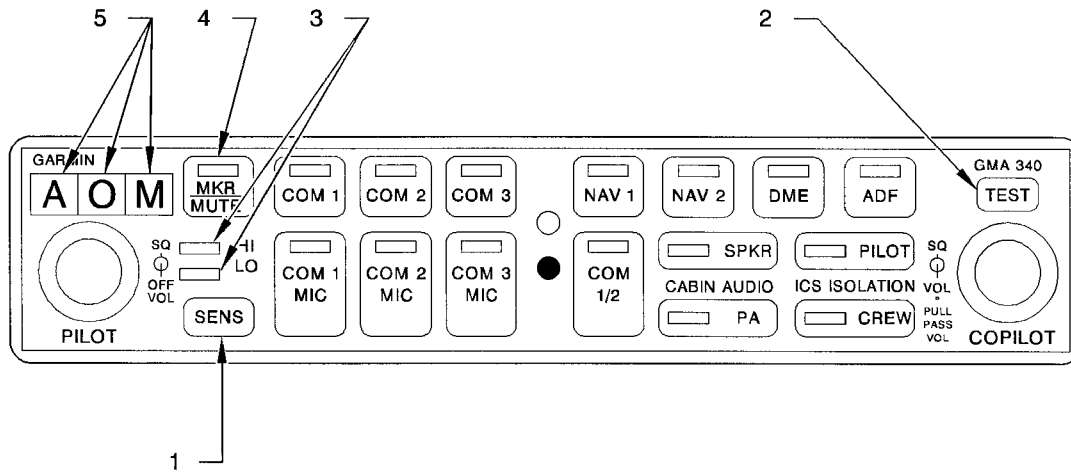
Variante de localisation
Alternate location



14343100AAAGVZ4100

Marker - Identification and location of components
Figure 1

- 1 - "SENS" pushbutton
- 2 - "TEST" pushbutton
- 3 - "HI", "LO" indicator lights
- 4 - "MKR/MUTE" pushbutton
- 5 - MKR indicator light



Marker - A50 audio control panel
Figure 2

14231100AAA/WZ4100

INDEPENDENT POSITION DETERMINING

DESCRIPTION AND OPERATION

1. GENERAL

This section describes the systems which provide information to determine position. The systems are mainly independent of ground installations.

The installation consists of the stormscope system.

2. DESCRIPTION

A. Stormscope system - refer to 34-41-00

The stormscope system detects and localizes the electrical and magnetic fields emitted from lightning generated by thunderstorms.

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STORMSCOPE

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The stormscope is a system which allows localizing and visualizing storm electrical discharges.

The system consists of :

- an M60 indicator,
- an A74 processor,
- an E41 antenna.

The processor is connected to :

- the push-to-talk switches of the pilot's and R.H. front passenger's control wheels,
- the pilot's and R.H. front passenger's microphone jacks.

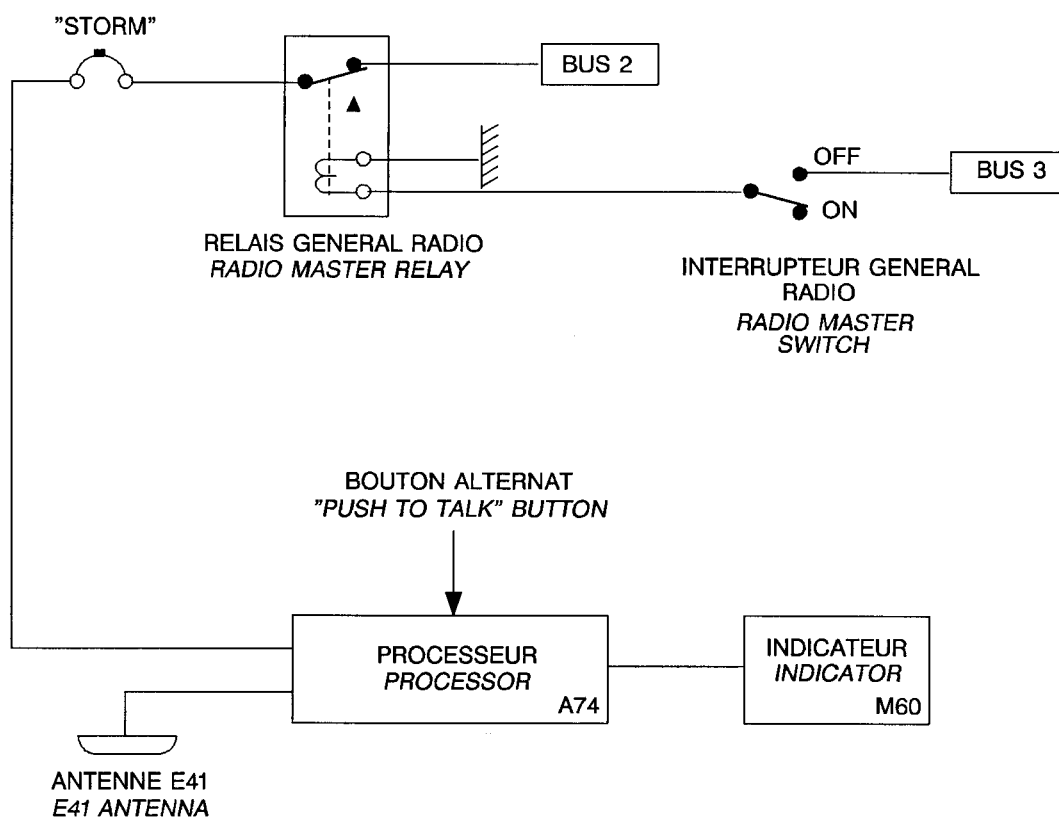
The stormscope is electrically supplied by "BUS 2" bar via the "STORM" circuit breaker.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M60 indicator	1	250	/	34-41-00
A74 processor	1	240	219	34-41-00
E41 antenna	1	220	/	34-41-03
Circuit breaker : - "STORM"	1	230	232L	WM

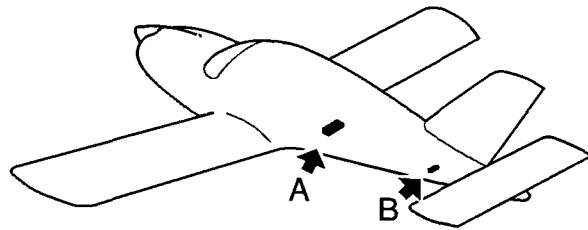
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

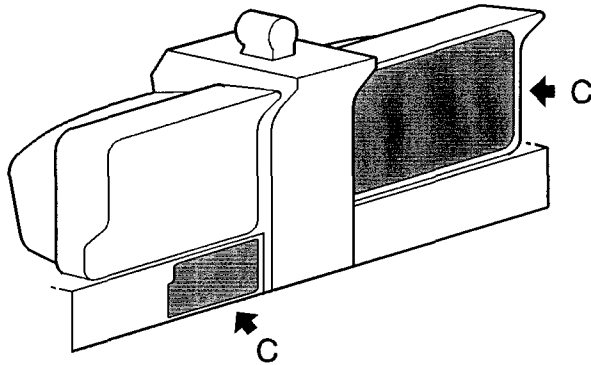


I4344100AAACWZ14100

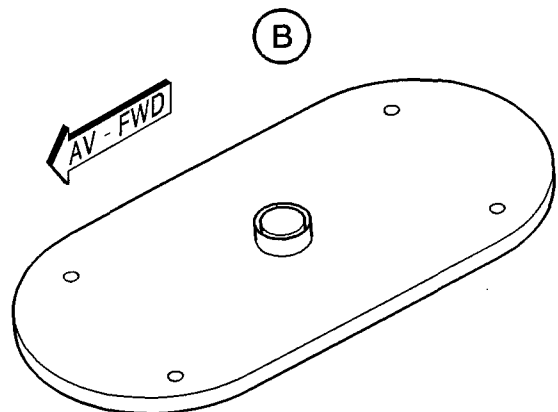
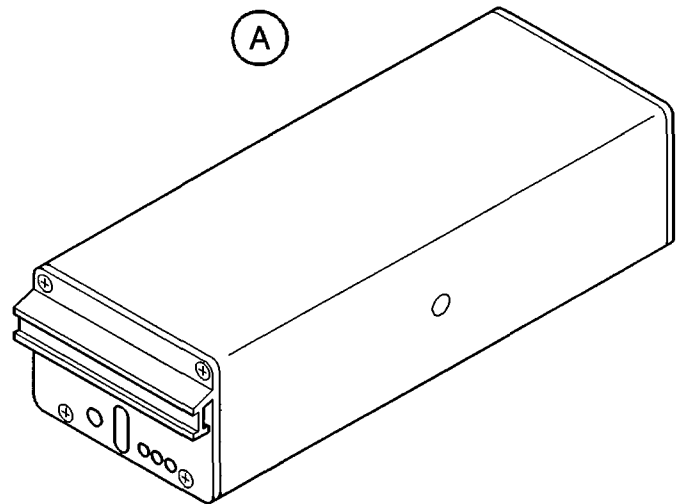
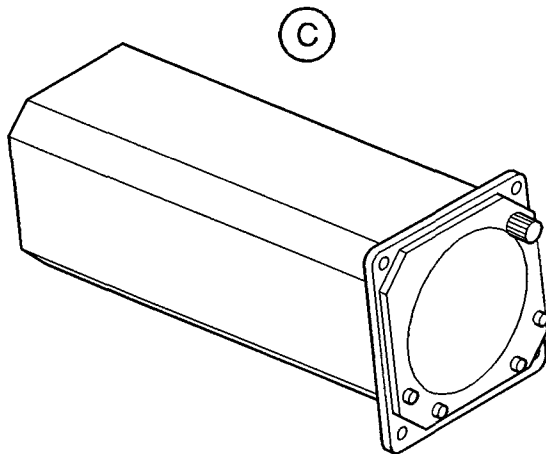
Stormscope - Electrical schematic
Figure 1



- A - A74 processor
- B - E41 antenna
- C - M60 indicator



 Variante de localisation
Alternate location



Stormscope - Identification and location of components
Figure 2

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STORMSCOPE

DESCRIPTION AND OPERATION

1. GENERAL

The stormscope system locates in azimuth and range the electrical thunderstorm-related discharges.

The system consists of :

- the A74 processor,
- the E41 antenna,
- the S133 switch.
- the A90 26V/400Hz converter (option).

The system also uses the following components to display information :

- a multifunction display - refer to 34-62-00,
- or a COMM./VOR-ILS/GPS A78 transceiver (Garmin GNS) - refer to 34-51-00.

The system receives data from the heading reference system - refer to 34-21-00.

A74 processor is connected through CR21 and CR22 diodes with :

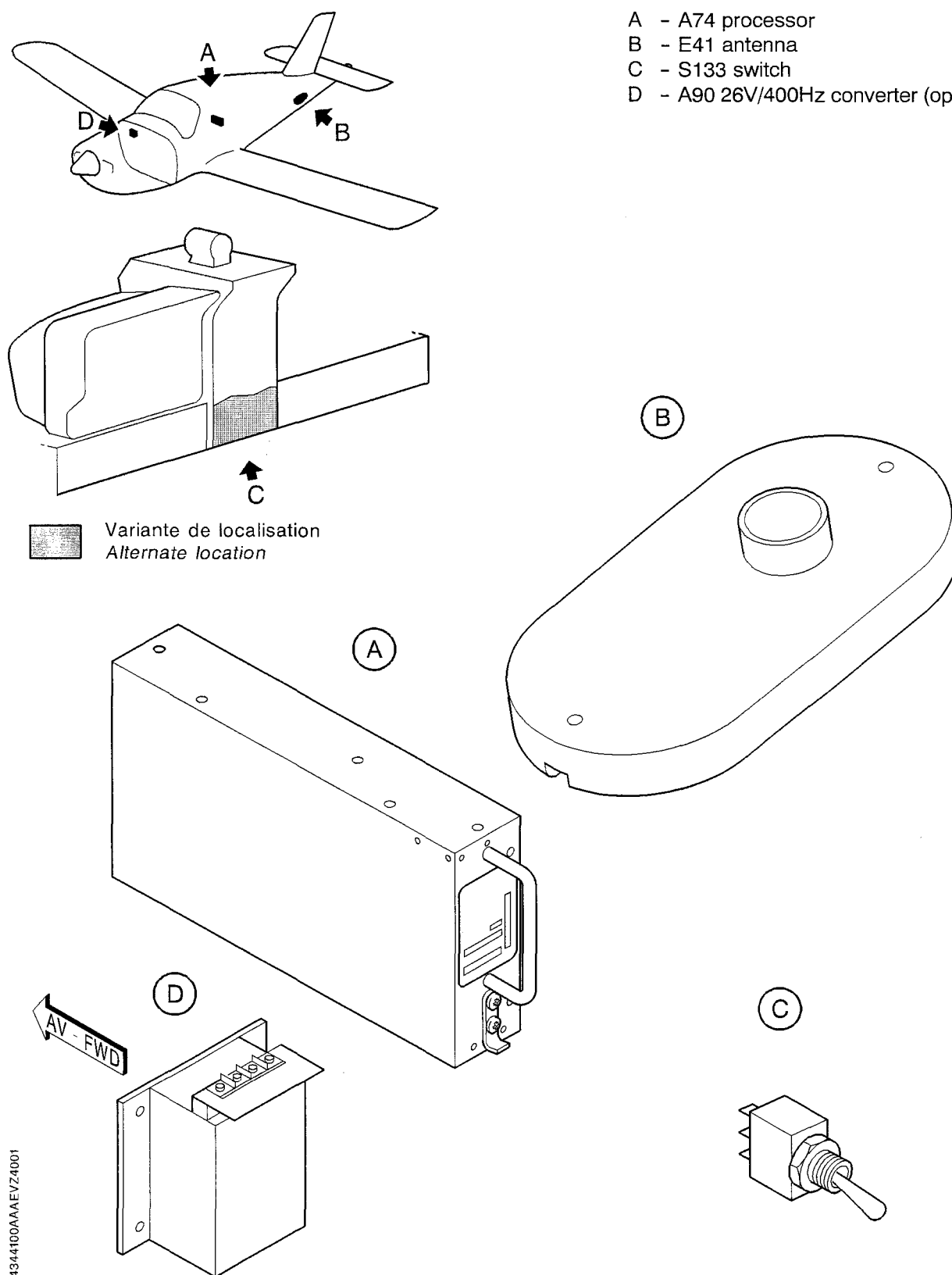
- the pilot's and R.H. front station push-to-talk switches,
- the pilot's and R.H. front station microphone jacks.

The stormscope system is electrically supplied by "BUS 2" bar.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A74 processor	1	240	219	34-41-02
E41 antenna	1	220	/	34-41-03
S133 switch	1	250	/	34-41-00
A90 26V/400Hz converter (option)	1	250	211R	34-41-00
Circuit breaker : - CB 95 "STORM"	1	PL1	/	WM
Fuse (option) : - "26V/400Hz CONV"	1	250	211L	WM

- A - A74 processor
- B - E41 antenna
- C - S133 switch
- D - A90 26V/400Hz converter (option)



Stormscope - Identification and location of components
Figure 1

3. DESCRIPTION

A. A74 processor

A74 processor receives information about the electrical discharges detected by the antenna, determines their sources and ranges and elaborates the data necessary for presentation on the display.

The processor consists of a parallelepipedic rectangular unit designed to be rack-mounted. The front face of the processor features a handle to enable the component to be extracted from its rack. It also features LED indicators that are useful for system trouble-shooting.

A74 processor analyzes the information forwarded by E41 antenna. Applying sophisticated engineering algorithms, it simultaneously processes the information enclosed in the electrical field detected by the sense antenna and the information enclosed in the magnetic field detected by the loop antenna. A74 processor forwards the results for presentation on display system.

A74 processor is mounted on baggage compartment floor. It is protected by a cover.

It is electrically supplied by "BUS 2" bar and protected by CB 95 "STORM" circuit breaker.

B. E41 antenna

Antenna transmits the detected signals to the processor via a special cable (EMI/RFI protection).

Antenna is flat and has a low profile, it features two holes for attachment on the aircraft fuselage.

Antenna combines in the same item a loop antenna and a sense antenna as well as preamplification circuits.

Antenna is supplied by a symmetrical voltage ± 12 VDC provided by A74 processor.

Antenna is mounted under the fuselage between C8 and C9 frames.

C. S133 "STORM" switch

The switch enables energization of A74 processor.

It is mounted on a panel on the front face of radio rack.

D. A90 26V/400Hz converter (option)

A90 converter generates AC 26V/400Hz voltage from DC 28V voltage. It supplies reference AC voltage to synchro-transmitter of heading reference system and to all the systems that use the heading information.

The converter is electrically supplied by "BUS 3" bar and protected by "26V/400Hz CONV" fuse of the fuse panel.

The converter is mounted on the firewall, on the R.H. side in the cabin area.

4. OPERATION (Figure 2)

Aircraft with multifunction display

A. Energization

The processor sends data to be displayed to the multifunction display via a RS 232 link. Energize the multifunction display and select with "WX" pushbutton the display of stormscope system data.

Pre-MOD. SB 10-136-34

A74 processor does not take into account magnetic heading information of the aircraft.

Aircraft S/N 2180, 2181, 2185 to 2187, 2189, 2190, 2197, 2199 to 9999 or post-MOD. SB 10-136-34

A74 processor takes into account magnetic heading information of the aircraft. This information makes it possible, when the aircraft is turning, to automatically update the location of the electrical discharges already represented on the display.

All

"STORM" switch energizes the system that initializes internal self-test. When the self-test is complete the system is operational or displays an error message to show the detected anomaly.

The push-to-talk switches are routed to the processor through CR21 and CR22 diodes (the diodes are incorporated into the wiring and located close to the processor). The processor is inhibited during the whole transmission duration of any radio communication device equipping the aircraft.

B. "CELL" mode

In "CELL" mode, green crosses "+" appear on the multifunction display showing the concentration areas of electrical discharges detected in a 360-degree area around the aircraft or a 120-degree area ahead of the aircraft depending on the selection. "CELL" mode is selected with "MODE" pushbutton of the multifunction display. "RNG" pushbuttons are used to select the distance scale and "VIEW" pushbutton is used to select the 360-degree area around the aircraft or the 120-degree area ahead of the aircraft.

C. "STRIKE" mode

In "STRIKE" mode, green crosses "x" appear on the multifunction display showing the electrical discharges detected in real-time in a 360-degree area around the aircraft or a 120-degree area ahead of the aircraft depending on the selection. "STRIKE" mode is selected with "MODE" pushbutton of the multifunction display. "RNG" pushbuttons are used to select the distance scale and "VIEW" pushbutton is used to select the 360-degree area around the aircraft or the 120-degree area ahead of the aircraft.

Aircraft with display on GNS530

A. Energization

The processor sends data to be displayed to the COMM./VOR-ILS/GPS A78 transceiver via a RS 232 link. On COMM./VOR-ILS/GPS A78 transceiver, R.H. concentric knobs allow selecting "Traffic/Weather" page in NAV chapter to display stormscope function.

"STORM" switch energizes the system that initializes internal self-test. "TEST" message appears on the screen R.H. upper corner during the self-test. "MENU" pushbutton on COMM./VOR-ILS/GPS A78 transceiver gives access to stormscope system controls via the menu page. The internal concentric knob and "ENT" pushbutton are respectively used to select and enable the control.

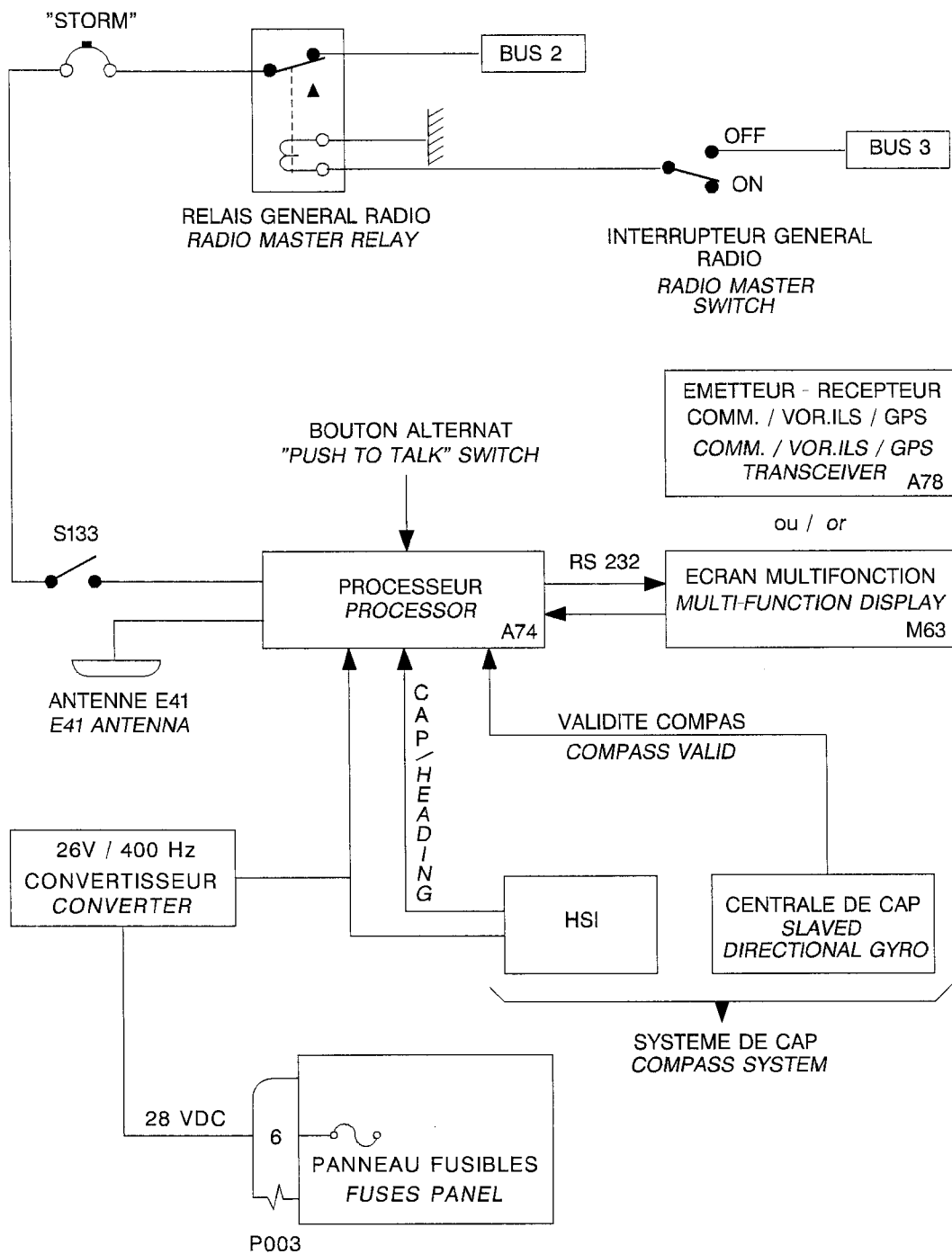
The push-to-talk switches are routed to the processor through CR21 and CR22 diodes (the diodes are incorporated into the wiring and located close to the processor). The processor is inhibited during the whole transmission duration of any radio communication device equipping the aircraft.

B. "CELL" mode

"CELL" mode displays concentration areas of electrical discharges detected in a 360-degree area around the aircraft or a 120-degree area ahead of the aircraft depending on the selection. This mode is the most convenient for periods of high level of electrical activity. To select the mode, from "Traffic/Weather" page momentarily press the R.H. internal concentric knob to display the cursor function on the mode selected previously. Turn the internal concentric knob to select the mode. Momentarily press the internal concentric knob to disable cursor function and then press "ENT" pushbutton to enable the selection.

C. "STRIKE" mode

"STRIKE" mode displays electrical discharges detected in real-time in a 360-degree area around the aircraft or a 120-degree area ahead of the aircraft depending on the selection. This mode is the most convenient for periods of low level of electrical activity. To select the mode, from "Traffic/Weather" page momentarily press the R.H. internal concentric knob to display the cursor function on the mode selected previously. Turn the internal concentric knob to select the mode. Momentarily press the internal concentric knob to disable cursor function and then press "ENT" pushbutton to enable the selection.



14341100AAAFVZ4001

Stormscope - Schematic
Figure 2

STORMSCOPE

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The stormscope is a system which allows localizing and visualizing storm electrical discharges.

The system consists of :

- the M60 indicator,
- the A74 processor,
- the E41 antenna,
- the 26 V / 400 Hz converter.

The processor is connected to :

- the heading reference system (magnetic heading information) – refer to 34-21-00,
- the push-to-talk switches of the pilot's and R.H. front passenger's control wheels through CR21 and CR22 diodes),
- the pilot's and R.H. front passenger's microphone jacks.

The 26 V / 400 Hz converter can be equipped with a printed circuit board which includes two zener diodes.

In former aircraft the slaved directional gyro of the heading reference system in conjunction with an external relay (E019) provides a heading flag signal to the processor. The relay (if installed) is fixed on the slaved directional gyro support.

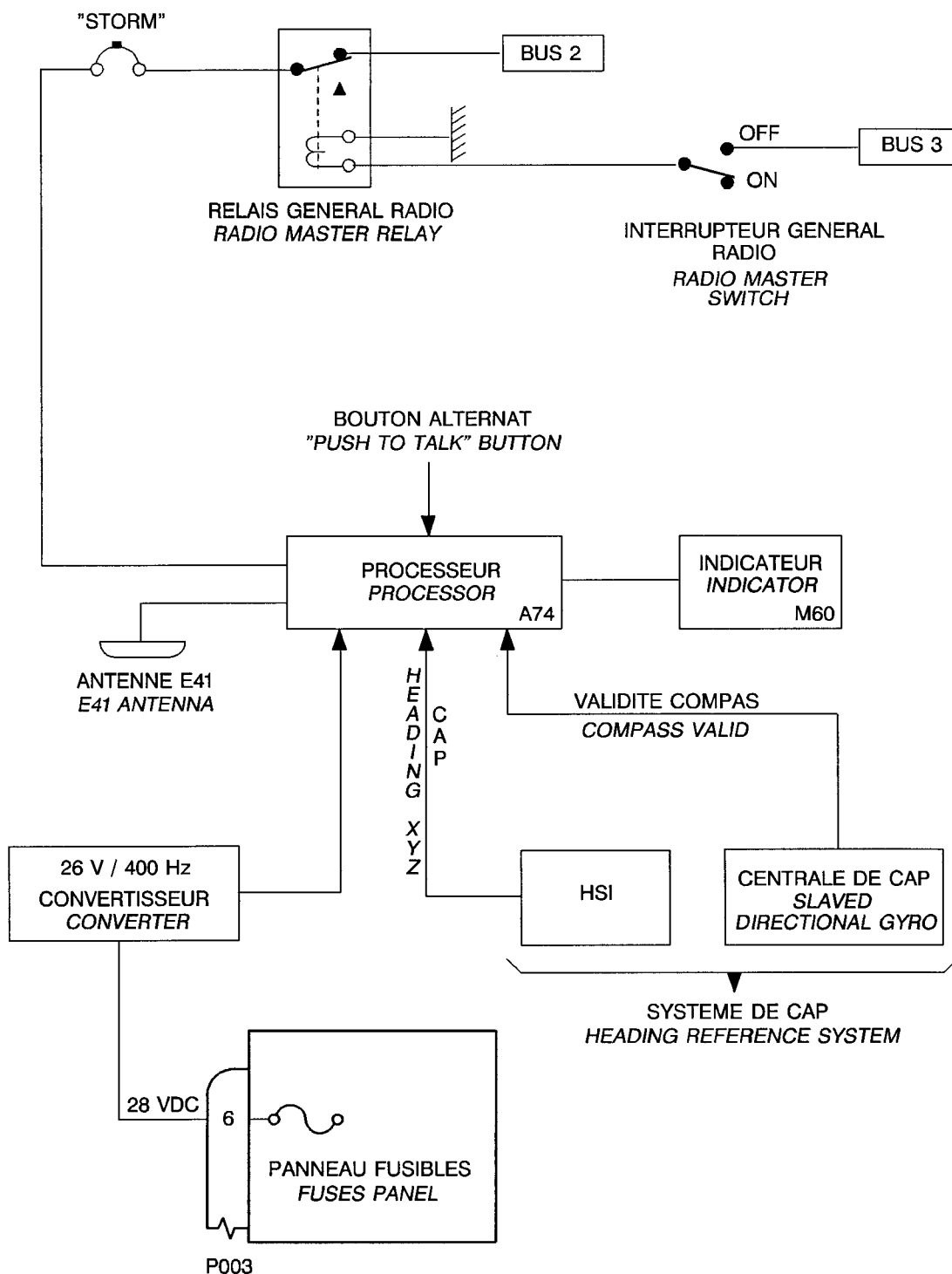
The stormscope is electrically supplied by "BUS 2" bar via the "STORM" circuit breaker.

2. LOCATION (Figure 2)

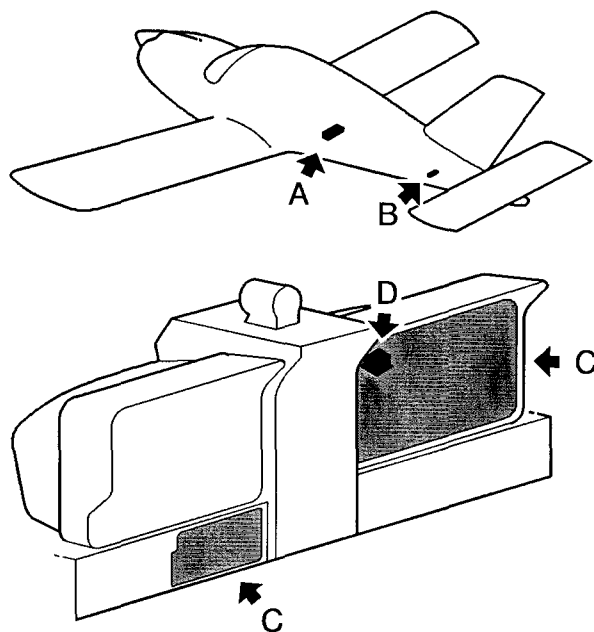
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M60 indicator	1	250	/	34-41-00
A74 processor	1	240	219	34-41-00
E41 Antenna	1	220	/	34-41-03
26 V / 400 Hz converter	1	250	211R	34-41-00
Fuse: - "26V/400Hz CONV."	1	250	211L	WM
Circuit breaker : - "STORM"	1	230	232L	WM

3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



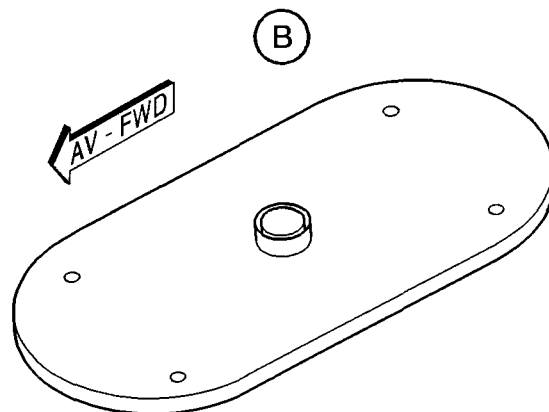
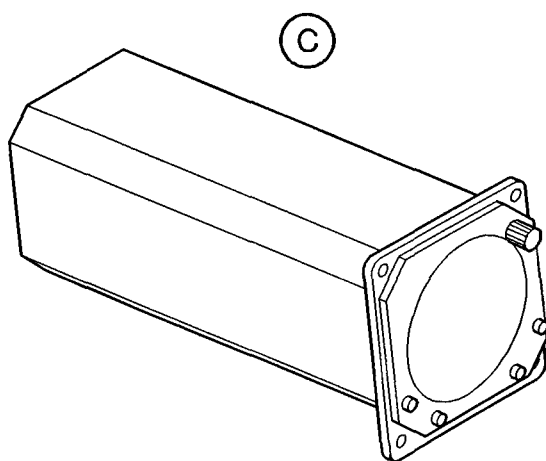
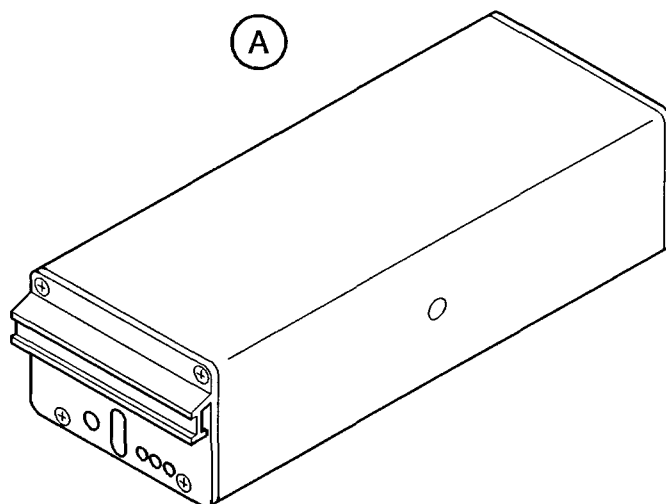
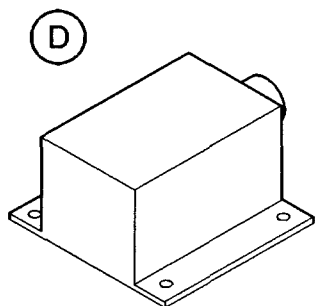
Stormscope - Electrical schematic
Figure 1



- A - A74 processor
- B - E41 antenna
- C - M60 indicator
- D - 26 V / 400 Hz converter



Variante de localisation
Alternate location



14344100AAACWZ4100

Stormscope - Identification and location of components
Figure 2

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STORMSCOPE

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The stormscope is an optional system which allows localizing and visualizing storm electrical discharges.

The system consists of :

- the M60 indicator,
- the E41 antenna,
- the S133 switch (if installed)

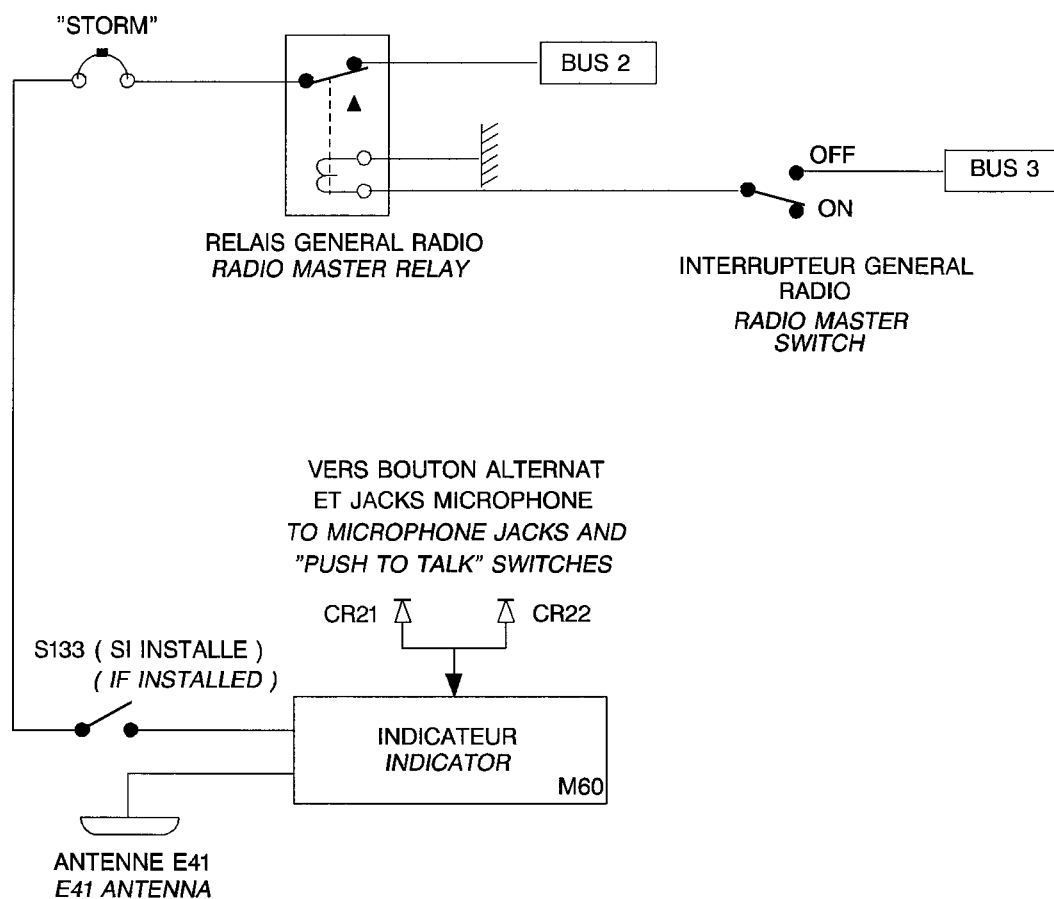
The indicator is connected through CR21 and CR22 diodes to :

- the push-to-talk switches of the pilot's and R.H. front passenger's control wheels,
- the pilot's and R.H. front passenger's microphone jacks.

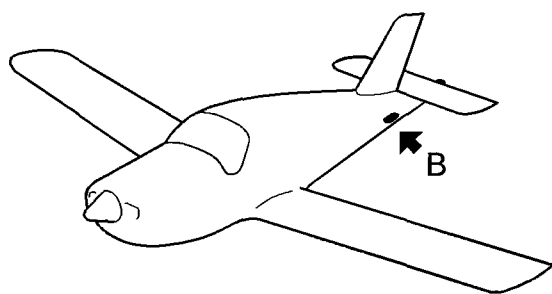
The system is electrically supplied by "BUS 2" bar.

2. LOCATION (Figure 2)

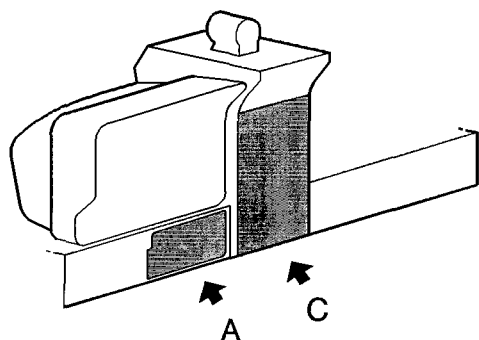
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M60 indicator	1	250	/	/
E41 antenna	1	220	/	/
S133 switch (if installed)	1	250	/	/
Circuit breaker : - "STORM"	1	230	232L	WM



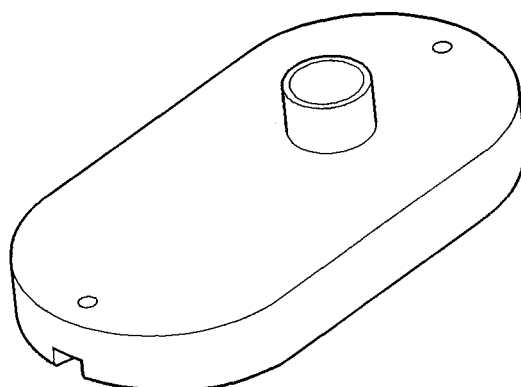
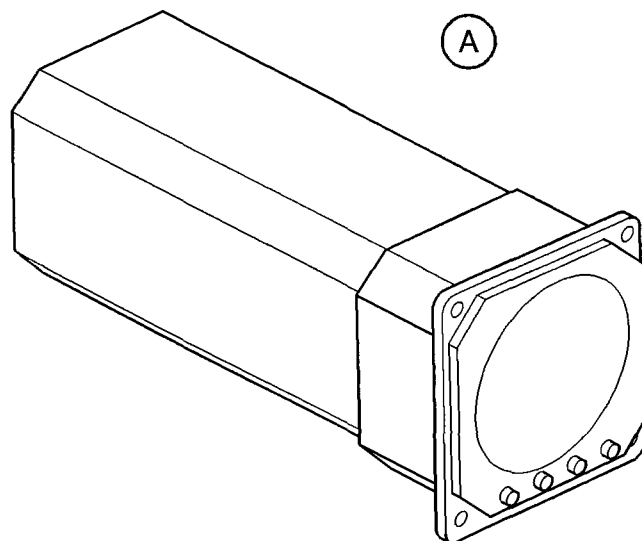
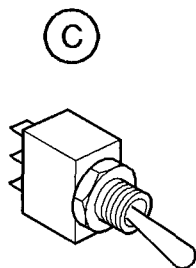
Stormscope - Schematic
Figure 1



- A - M60 indicator
- B - E41 antenna
- C - S133 switch (if installed)



 Variante de localisation
Alternate location



Stormscope - Identification and location of components
Figure 2

I4344100AAACWZ24200

ADAD
Validity : WX 900

3. DESCRIPTION

A. M60 indicator

M60 indicator receives information about the electrical discharges detected by the antenna, determines their sources and ranges and displays the information.

The front face of the unit features an LCD display and all the controls enabling the stormscope system to be operated.

The indicator is electrically supplied by "BUS 2" bar via S133 switch and protected by "STORM" circuit breaker.

The indicator is located on L.H. panel strip.

B. E41 antenna

E41 antenna is flat and has a low profile, it features two holes for attachment on the aircraft fuselage.

E41 antenna combines in the same item a loop antenna an a sense antenna as well as preamplification circuits.

E41 antenna is supplied by a symmetrical voltage ± 12 VDC provided by M60 indicator.

E41 antenna is mounted under the fuselage between C8 and C9 frames.

4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

STORMSCOPE ADJUSTMENT / TEST

1. STORMSCOPE OPERATIONAL TEST

A. Tools and consumable materials

- Ground power unit

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Connect the ground power unit - refer to 24-40-00.
- 3) Close main switch-breaker.
- 4) Make sure "STORM." switch is set to "OFF".

Aircraft with multifunction display

- 5) Make sure that multifunction display is de-energized ("OFF-ON" pushbutton set to "OFF" position).
- 6) Set radio master switch to "ON".
- 7) Perform the following test :

ACTION	RESULT
(1) Press "OFF-ON" pushbutton to energize the multifunction display.	(a) The multifunction display performs an automatic test procedure. (b) A test page appears on the multifunction display. NOTE : The test page lists the optional modules installed on the equipment.
(2) If necessary, momentarily press the pushbutton identified on the display by "OK" message to validate the test page.	(a) A page relating to the validity of Jeppesen "Data Base" appears on the multifunction display.
(3) Momentarily press the pushbutton identified on the display by "OK" message to validate the "Data Base" page.	(a) A "TOPO ON MAP" page (display of topographical map) appears on the multifunction display.
(4) Momentarily press "WX" pushbutton.	(a) Stormscope page with "NO DATA RECEIVED FROM STORMSCOPE" message appears on the multifunction display.

ACTION	RESULT
(5) Energize the Stormscope system with "STORM." switch.	(a) The system performs an automatic test procedure. (b) "NO DATA RECEIVED FROM STORMSCOPE" message appears during the whole test procedure. NOTE : At the end of the test, an error message appears if an anomaly has been detected.
(6) On the multifunction display, momentarily press "VIEW" pushbutton several times.	(a) Each time you press the pushbutton, the representation of a 360-degree area around the aircraft alternates on the multifunction display with the representation of a 120-degree area ahead of the aircraft.
(7) On the multifunction display, momentarily press "RNG" pushbuttons several times.	(a) On the multifunction display, the distance scale increases or decreases depending on the pushbutton operated.
(8) On the multifunction display, momentarily press "MODE" pushbutton several times.	(a) Each time you press the pushbutton, "STRIKE MODE" alternates on the multifunction display with "CELL MODE".
(9) De-energize the Stormscope system with "STORM." switch.	
(10) De-energize M63 multifunction display.	

Aircraft with display on GNS530

- 5) Set radio master switch to "ON".
- 6) Energize COMM./VOR-ILS/GPS transceiver - refer to 34-57-00 Page 501.
- 7) Perform the following test :

ACTION	RESULT
(1) On COMM./VOR- ILS/GPS transceiver, turn R.H. external concentric knob as many times as necessary (to the right or the left) and select NAV chapter.	(a) "NAV" message appears at the bottom of COMM./VOR-ILS/ GPS transceiver display. NOTE : Each rotation of the concentric knob allows sequential selection of one of the four chapters in the following order : NAV, WPT, AUX and NRST.

ACTION	RESULT
(2) On COMM./VOR- ILS/GPS transceiver, turn R.H. internal concentric knob as many times as necessary (to the right or the left) and select "Traffic/Weather" page.	(a) Stormscope function appears on the display. (b) "FAILED" message appears on the display. NOTE : Each rotation of the concentric knob allows sequential displacement of a cursor (to the right of NAV message) that represents the different pages of NAV chapter.
(3) Energize the stormscope system with "STORM." switch.	(a) After a few seconds, the stormscope system performs an automatic test procedure. (b) "TEST" message appears on the display during the whole test procedure.
(4) On COMM./VOR- ILS/GPS transceiver momentarily press "MENU" pushbutton.	(a) A "MENU" page appears on the display.
(5) Turn R.H. internal concentric knob as many times as necessary (to the right or the left) and select "VIEW 120° ?" or "VIEW 360° ?". Momentarily press "ENT" pushbutton.	(a) The representation of a 360-degree area around the aircraft alternates on the display with the representation of a 120-degree area ahead of the aircraft.
(6) On COMM./VOR- ILS/GPS transceiver, momentarily press "MENU" pushbutton.	(a) A "MENU" page appears on the display.
(7) Turn R.H. internal concentric knob as many times as necessary (to the right or the left) to select "SELF TEST ?". Momentarily press "ENT" pushbutton.	(a) After a few seconds, the stormscope system performs an automatic test procedure. (b) "TEST" message appears on the display during the whole test procedure.
(8) On COMM./VOR- ILS/GPS transceiver, momentarily press R.H. internal concentric knob.	(a) Operating mode of "STRIKE" or "CELL" stormscope system appears on the display in flashing negative video.
(9) Turn internal concentric knob (to the right or the left) to select "STRIKE" mode if "CELL" mode is displayed or vice versa.	(a) Operating mode of "STRIKE" or "CELL" stormscope system appears on the display in flashing negative video.
(10) Momentarily press R.H. internal concentric knob. Momentarily press "ENT" pushbutton.	(a) Operating mode of "STRIKE" or "CELL" stormscope system appears on the display without negative video.
(11) De-energize the stormscope system with "STORM." switch.	

All

- 8) Set radio master switch to "OFF".
- 9) Open main switch-breaker.
- 10) Disconnect the ground power unit – refer to 24-40-00.

A74 PROCESSOR REMOVAL / INSTALLATION

1. REMOVAL OF A74 PROCESSOR (Figure 401)

A. Tools and consumable material

- None

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Install the warning sign prohibiting main switch-breaker operation.

WARNING
DO NOT OPERATE
MAINTENANCE WORK IN PROGRESS

- 3) Open baggage compartment door 219.
- 4) Remove screws, washers and processor protecting cover.
- 5) Loosen hold-down mechanism (3).
- 6) Remove A74 processor (2) from rack (1).

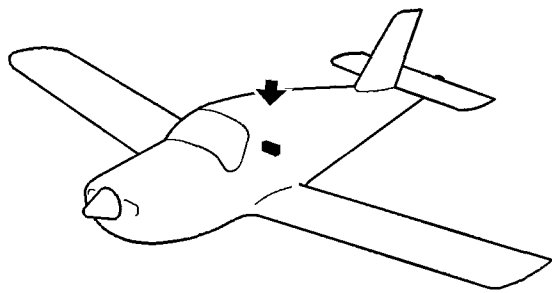
2. INSTALLATION OF A74 PROCESSOR (Figure 401)

A. Tools and consumable material

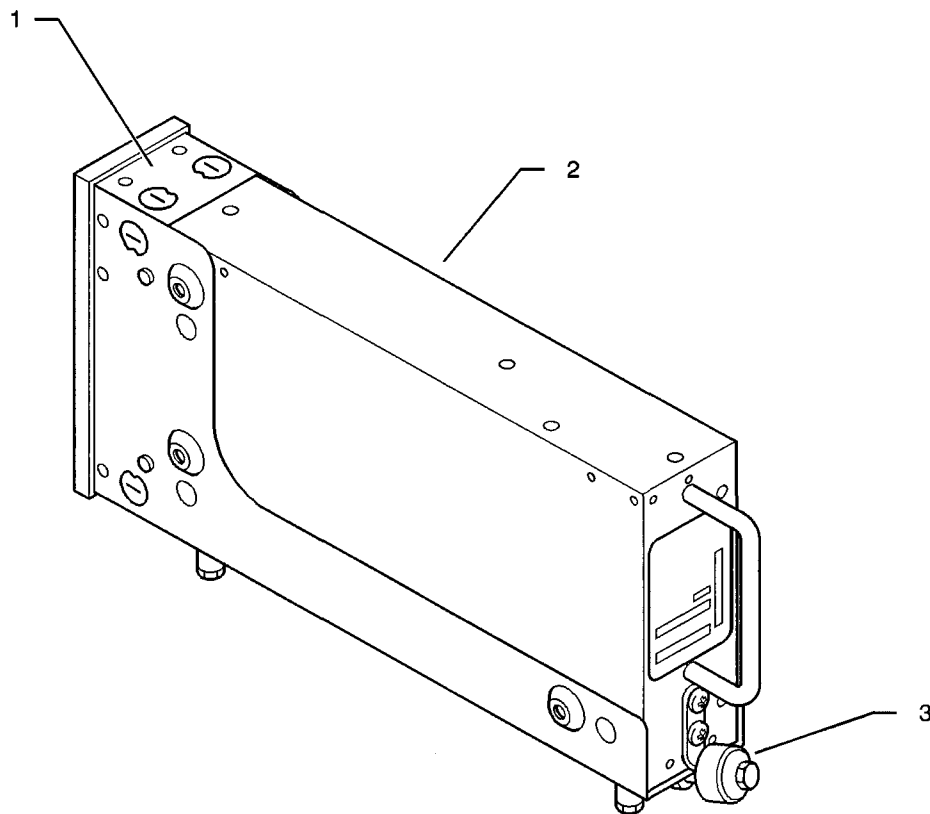
- None

B. Procedure

- 1) Inspect the interfaces for cleanliness and condition.
- 2) Engage A74 processor (2) in rack (1).
- 3) Tighten hold-down mechanism (3).
- 4) Repair existing bonding points on protecting cover – refer to 20-00-12.
- 5) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 6) Install screws, washers and processor protecting cover.
- 7) Protect bonding areas on protecting cover – refer to 20-00-12.
- 8) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 9) Close baggage compartment door 219.
- 10) Remove the warning sign prohibiting main switch-breaker operation.
- 11) Perform an operational test of the system.



- 1 - Rack
- 2 - A74 processor
- 3 - Hold-down mechanism



A74 processor – Removal / Installation
Figure 401

14344100AAAAEVZ4100

E41 STORMSCOPE ANTENNA MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - E41 STORMSCOPE ANTENNA (Figures 201 and 201A)

A. Tools and consumable materials

- Sealant (TB 09-903)
- Sealant (TB 09-904)
- Plastic scraper
- Clean lintfree cloths
- Cleaning agent (TB 11-912)
- Blanking caps and plugs

B. Removal of E41 stormscope antenna

- 1) Make sure that the main switch-breaker is open.
- 2) If a sealant bead is applied around the antenna, remove the sealant with a plastic scraper.
- 3) Open baggage compartment door 219 and remove door 242.
- 4) Disconnect connector (1).

With WX 1000 series

- 5) Hold E41 antenna (5) and remove screws (6).
- 6) Remove E41 antenna (5).
- 7) Retain gasket (2), MYLAR washers (3) and washers (4).

With WX 500 series

- 5) Hold E41 antenna (5) and remove screws (6) and washers (4).
- 6) Remove E41 antenna (5).
- 7) Retain gasket (2).

- 8) If necessary, remove any sealant residues around the hole (7) of support.

All

- 9) Blank off connector (1).

- 10) If necessary, remove any sealant residues on the antenna and the fuselage.

C. Installation of E41 stormscope antenna

- 1) Make sure that the main switch-breaker is open.
- 2) Inspect gasket (2) for condition. Replace gasket if necessary.
- 3) Remove the blanking cap from connector (1).

AAAA

Validity : All WX 1000 - WX 500 series

With WX 1000 series

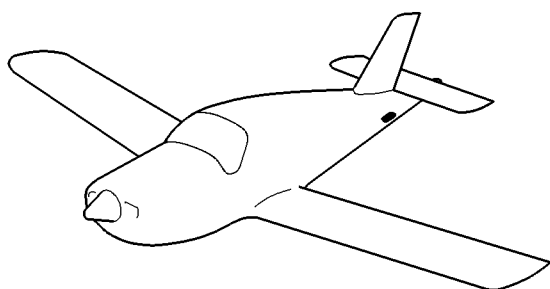
- 4) Fit the antenna with screws (6), washers (4), MYLAR washers (3) and gasket (2).
- 5) Position E41 antenna (5) with the arrow pointing forwards.
- 6) Secure the antenna with screws (6).
- 7) Connect connector (1).

With WX 500 series

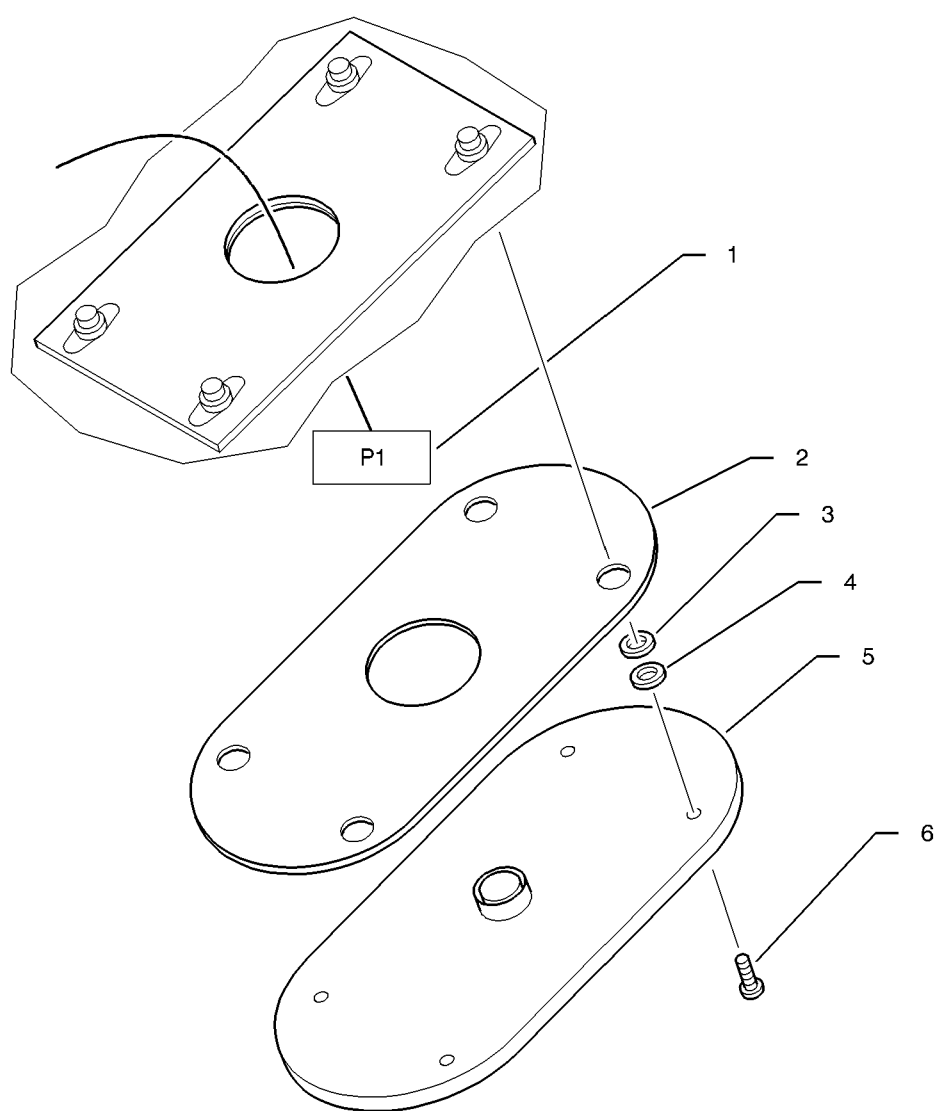
- 4) Fit the antenna with gasket (2).
- 5) Position E41 antenna (5) with the arrow pointing forwards.
- 6) Secure the antenna with screws (6) and washers (4).
- 7) Connect connector (1). Seal hole (7) with some sealant (TB 09-904).

All

- 8) Apply a bead of sealant (TB 09-903) around the antenna. Smooth the bead.
- 9) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 10) Install door 242 and close baggage compartment door 219.
- 11) Perform an operational test of the system.



- 1 - Connector
- 2 - Gasket
- 3 - MYLAR washer
- 4 - Washer
- 5 - E41 antenna
- 6 - Screw



14344103AAAAAVZ4000

E41 stormscope antenna - Removal / Installation
Figure 201 - WX 1000 series

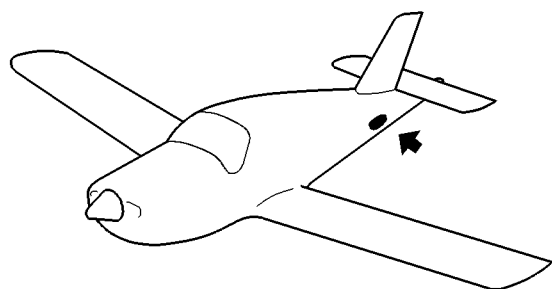
AAAA

Validity : All WX 1000 - WX 500 series

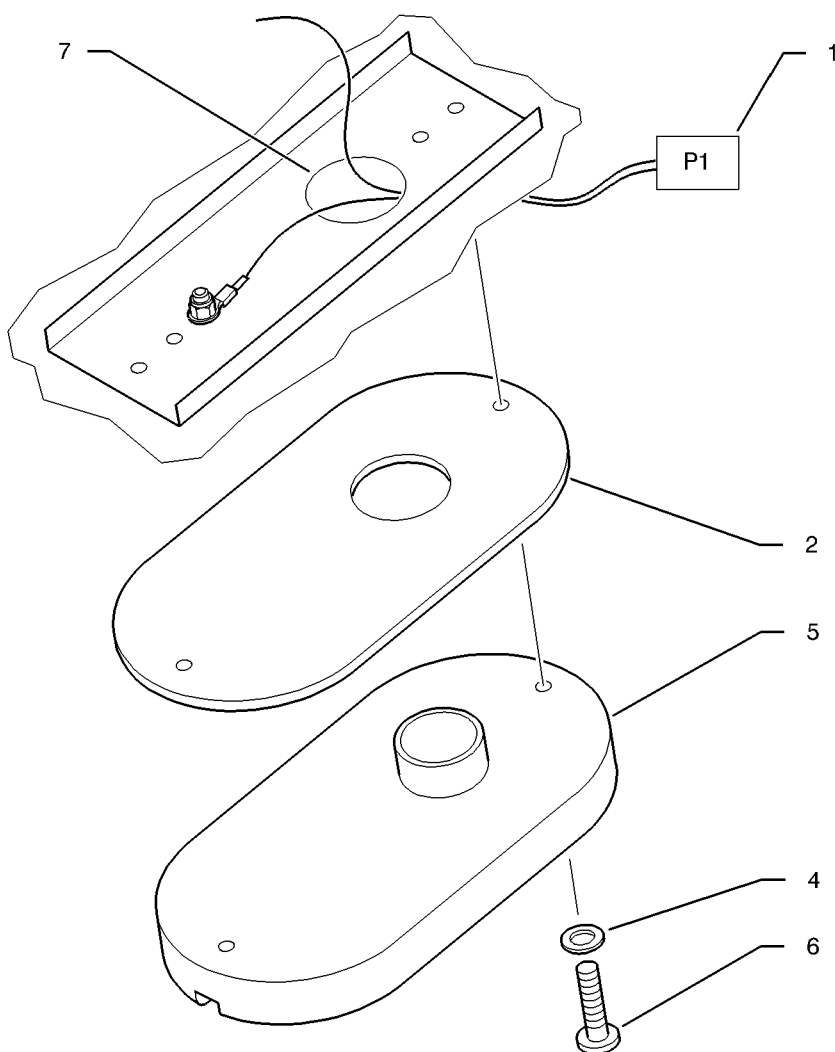
34-41-03

(BA)

Page 203
NOV 01



- 1 - Connector
- 2 - Gasket
- 4 - Washer
- 5 - E41 antenna
- 6 - Screw
- 7 - Hole



E41 stormscope antenna - Removal / Installation
Figure 201A - WX 500 series

14344100AAAAEVZ4201

DEPENDENT POSITION DETERMINING

DESCRIPTION AND OPERATION

1. GENERAL

This section describes the optional systems which depend mainly on ground-based installations to provide information concerning the position of the aircraft.

The installation consists of :

- the NAV 1 installation,
- the NAV 2 installation,
- the transponder,
- the Automatic Direction Finder (ADF),
- the Distance Measuring Equipment (DME) installation,
- the Global Positioning System (GPS).

2. DESCRIPTION

A. NAV 1 installation - refer to 34-51-00

The "NAV 1 installation" section describes the VOR / ILS 1 system. It also deals with the elements which constitute the aircraft VOR / ILS antenna.

B. NAV 2 installation - refer to 34-52-00

The "NAV 2 installation" section describes the VOR / ILS 2 system with its associated indicator.

C. Transponder - refer to 34-53-00

The transponder allows the identification of the aircraft by a ground-based air traffic control station.

D. Automatic Direction Finder (ADF) - refer to 34-54-00

The ADF system for radioelectric emission location allows elaborating transmission-related information of the ground-based transmitter (radiocompass).

E. DME installation - refer to 34-55-00

The DME installation allows measuring the slant range distance between a ground-based station and the aircraft.

F. Global Positioning System (GPS) - refer to 34-57-00

The GPS installation allows defining the position of an aircraft using a network of satellites.

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DEPENDENT POSITION DETERMINING MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - RADIONAVIGATION INSTRUMENTS (Figure 201)

NOTE : This procedure applies to most radionavigation instruments installed into the radio rack or the R.H. panel strip.

A. Tools and consumable materials

- 3/32 in (2.38 mm) Allen wrench

B. Typical removal procedure of a radionavigation instrument

- 1) Make sure that the main switch-breaker is open.
- 2) Insert a 3/32 in (2.38 mm) Allen wrench into orifice (2) located on the front face of the radionavigation instrument.

NOTE : The location of orifice (2) on the front face varies according to the radionavigation instrument.

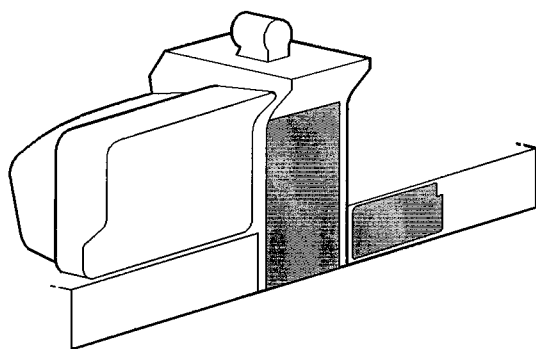
- 3) Fully unscrew the locking system. Do not force.
- 4) Extract the radionavigation instrument (1) by pulling it from the sides (Do not pull the instrument control knobs).

C. Typical installation procedure of a radionavigation instrument

- 1) Make sure that the main switch-breaker is open.
- 2) Check the condition of the pins of the connector secured at the bottom of the rack.
- 3) Insert the radionavigation instrument (1) in its rack.
- 4) Apply a light axial pressure to engage the instrument connector into the rack connector.
- 5) Screw the locking system with a 3/32 in (2.38 mm) Allen wrench.
- 6) Make sure the radionavigation instrument is correctly secured in its rack (correct locking).
- 7) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 8) If the instrument is replaced, perform a configuration, if necessary - refer to the corresponding Chapter/Section 34-5X-XX Page 500.

NOTE : For the first installation of some equipment, it is necessary to define parameters.

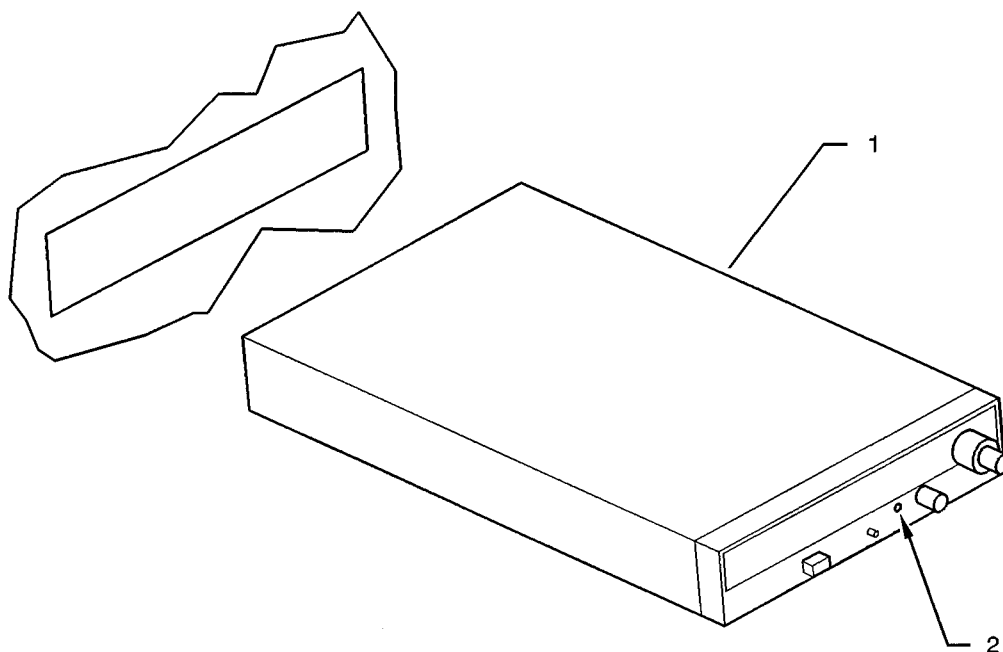
- 9) Perform an operational test of the system.



- 1 - Radionavigation instrument
- 2 - Orifice



Variante de localisation
Alternate location



I4345000AA BVVZ4000

Radionavigation instrument - Removal / Installation
Figure 201

AAAA
Validity : OPTION

NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The VOR is a short- and middle-range radio-navigation aid. It allows the pilot to locate the position of his aircraft with regard to a half-line crossing the VOR station (radial) or also to know the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The area navigation (RNAV) is a navigation method to fly from a point to another by following a selected course, but without having to fly towards another station. The selected course is defined by a waypoint.

The waypoint is a predetermined geographic position located in a space covered by a VOR / DME station.

The waypoint is defined by its radial and its distance at the VOR / DME station.

The waypoint is often named phantom station, because it provides the same navigation information as a VOR / DME station, which would be located on the waypoint.

The optional system consists of the following elements :

- an integrated navigation system,
- an optional VOR signal separator,
- an optional GS signal separator,
- a VOR / LOC antenna,
- a GS antenna,
- an optional DME warning indicator,
- an optional course deviation indicator (CDI).

Aircraft equipped with HSI option

In this case, the CDI is not installed and the system uses the horizontal situation indicator (HSI) of the heading reference system as indicator - refer to 34-21-00.

Aircraft equipped with GPS option interfaced with HSI

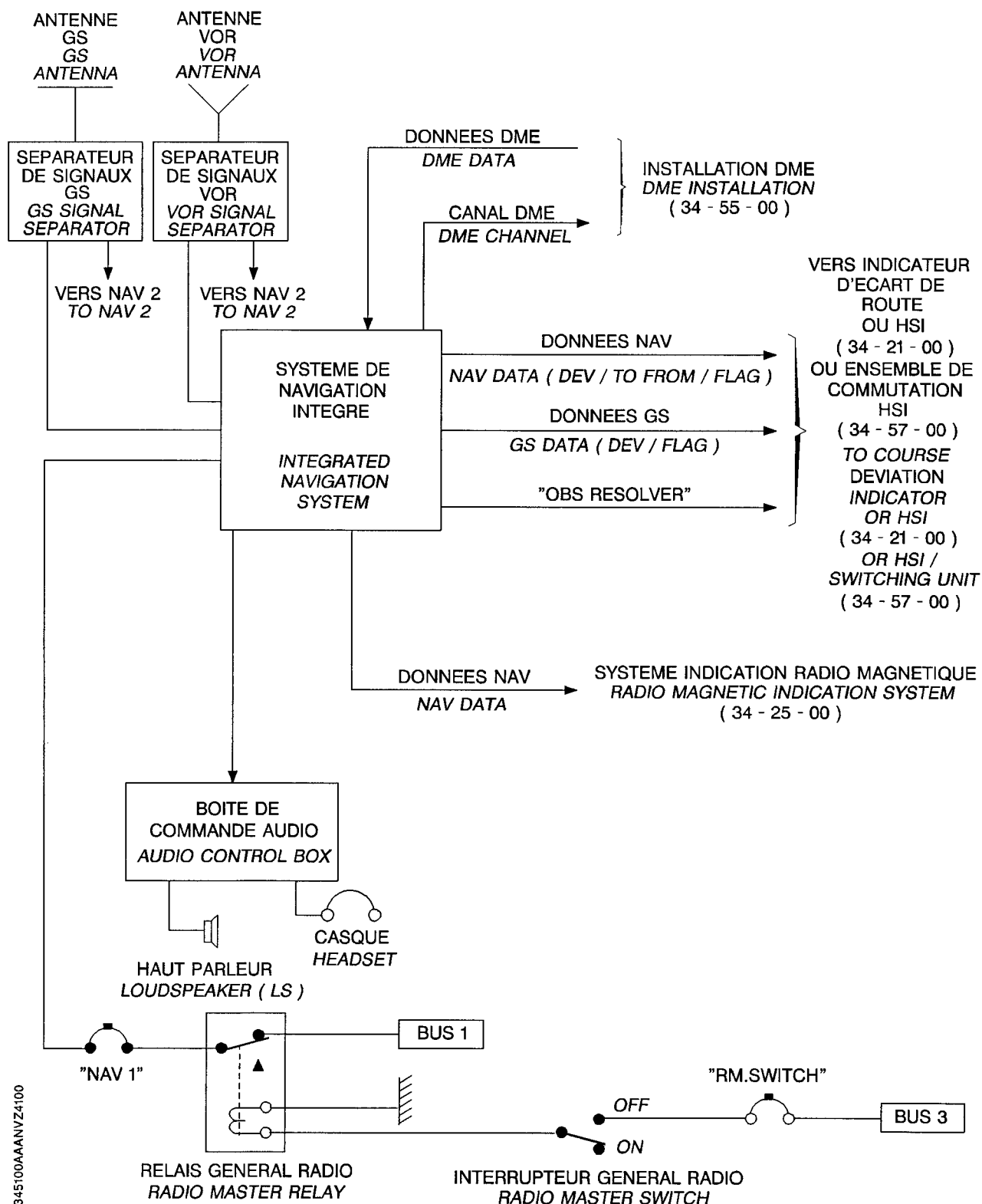
In this case, the CDI is not installed and the system sends VOR / LOC, RNAV and GS data through a switching unit (relays) to the HSI, using a NAV 1 / GPS switch annunciator - refer to 34-57-00.

All

In RNAV mode, the system operates jointly with the DME installation - refer to 34-55-00.

The NAV 1 installation is connected with :

- the audio control box - refer to 23-11-00,
- the optional radio magnetic indication system - refer to 34-25-00,
- the optional autopilot system - refer to 22-10-00.



NAV 1 Installation - Electrical schematic
Figure 1

The integrated navigation system combines in a single unit a VOR / LOC receiver, an RNAV computer and a glideslope receiver. The DME warning indicator (option) annunciates the situation where the frequency information used to tune the DME interrogator are not supplied by the integrated navigation system.

The signal separator (option) permits operation of two receivers from one antenna.

In RNAV, the system operates jointly with the DME installation - refer to 34-55-00.

The NAV 1 installation is connected with :

- the audio control box - refer to 23-11-00,
- the optional radio magnetic indication system - refer to 34-25-00,
- the optional autopilot system - refer to 22-10-00.

The system is electrically supplied by "BUS 1" bar and protected by "NAV 1" circuit breaker.

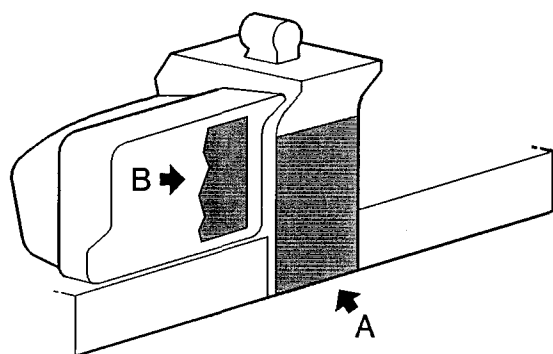
NOTE : For RUSSIAN and UKRAINIAN aircraft the system is electrically supplied by "BUS 2" bar.

2. LOCATION (Figures 2, 3 and 4)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Integrated navigation system	1	251C	/	34-50-00
VOR signal separator (option)	1	251C	/	34-51-00
GS signal separator (option)	1	251C	/	34-51-00
VOR / LOC antenna	1	310	311 or 313	34-51-00
GS antenna	1	310	311 or 313	34-51-00
Course deviation indicator (option)	1	251L	/	34-51-00
DME warning indicator (option)	1	251C	/	34-51-00
Circuit breaker : - "NAV 1"	1	230	232L	WM

3. OPERATION

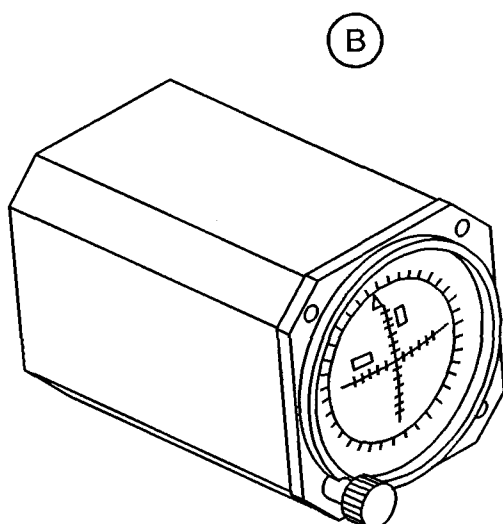
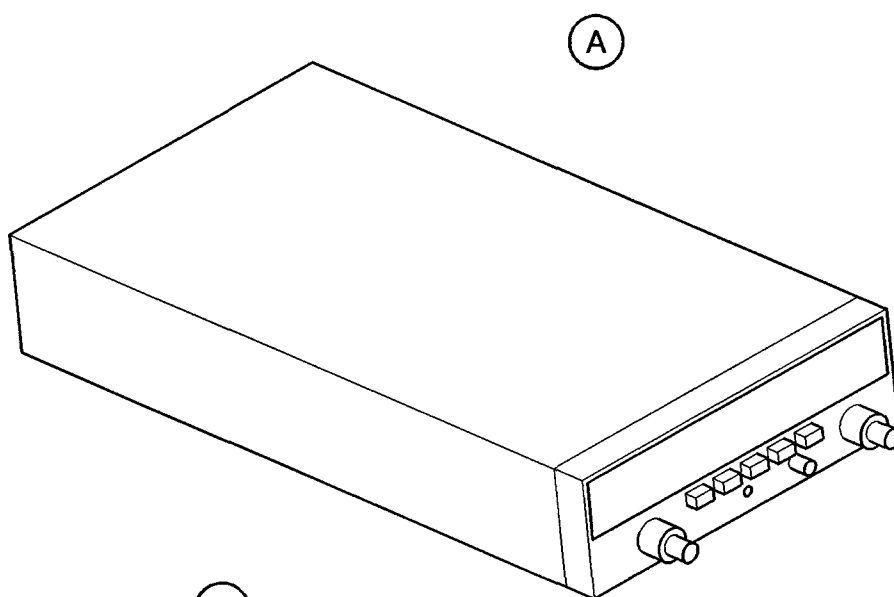
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



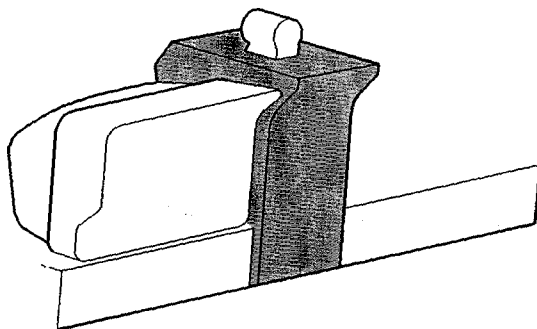
- A - Integrated navigation system
- B - Course deviation indicator (option)



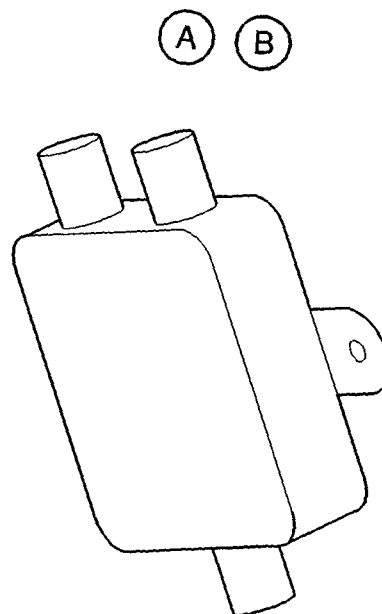
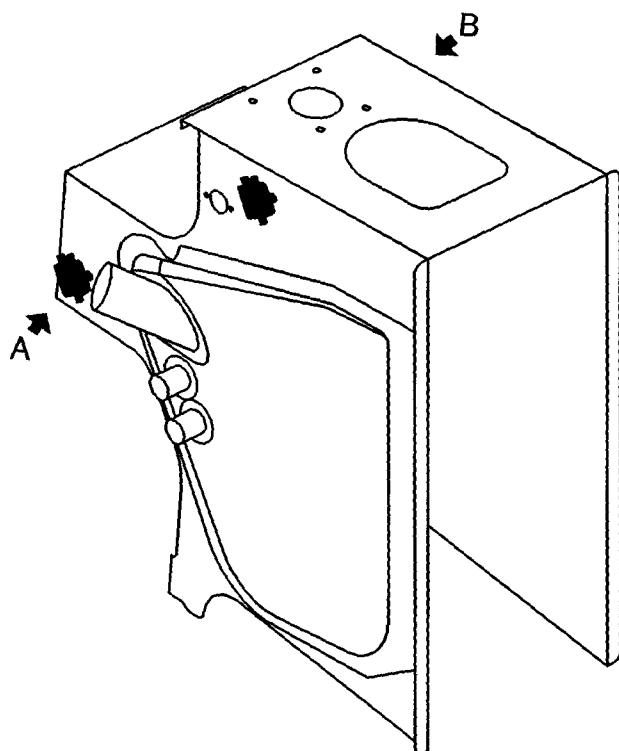
Variante de localisation
Alternate location



NAV 1 Installation - Identification and location of components
Figure 2



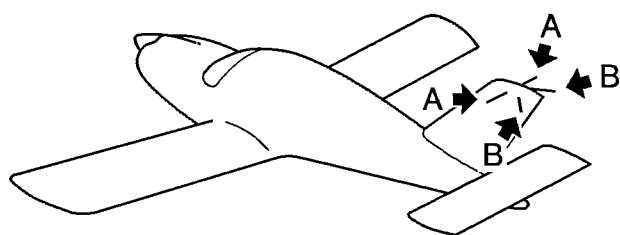
- A - VOR signal separator (option)
- B - GS signal separator (option)



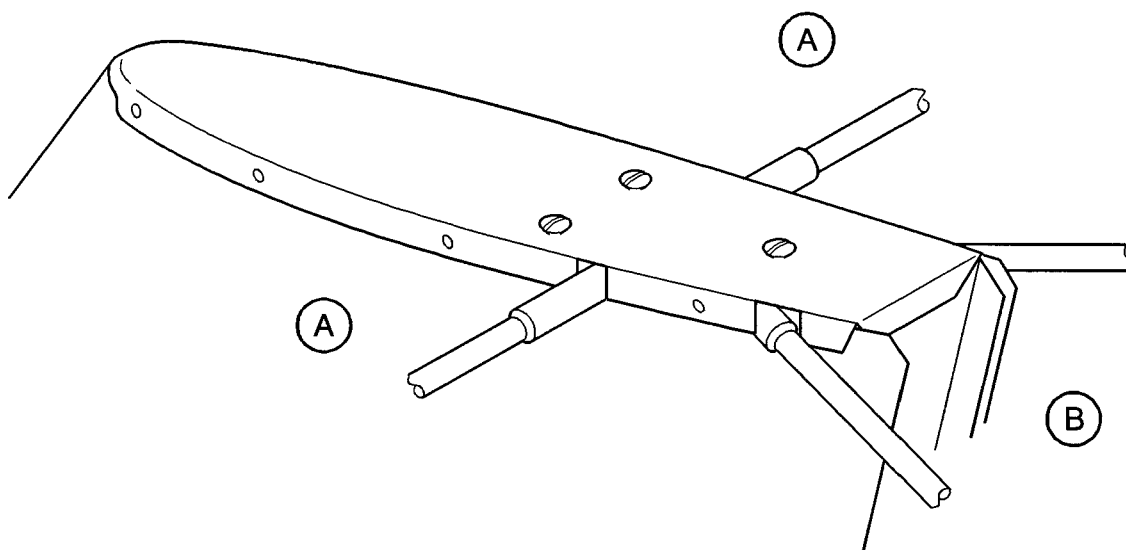
14345100AAAAPWZ4000

NAV 1 Installation - Identification and location of components
Figure 3

AGAG
Validity : KNS 81



- A - GS antenna
- B - VOR / LOC antenna



NAV 1 Installation - Identification and location of components
Figure 4

NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The VOR is a short- and middle-range radio-navigation aid. It allows the pilot to locate the position of his aircraft with regard to a half-line crossing the VOR station (radial) or also to know the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The area navigation (RNAV) is a navigation method to fly from a point to another by following a selected course, but without having to fly towards another station. The selected course is defined by a waypoint.

The waypoint is a predetermined geographic position located in a space covered by a VOR / DME station.

The waypoint is defined by its radial and its distance at the VOR / DME station.

The waypoint is often named phantom station, because it provides the same navigation information as a VOR / DME station, which would be located on the waypoint.

The optional system consists of the following elements :

- an integrated navigation system,
- an optional VOR signal separator,
- an optional GS signal separator,
- a VOR / LOC antenna,
- a GS antenna,
- a DME antenna,
- an optional course deviation indicator (CDI).

Aircraft equipped with HSI option

In this case, the CDI is not installed and the system uses the horizontal situation indicator of the heading reference system as indicator - refer to 34-21-00.

All

The system uses DME antenna. It also sends a suppression pulse to the transponder - refer to 34-53-00.

The system sends audio signals to audio control box - refer to 23-11-00.

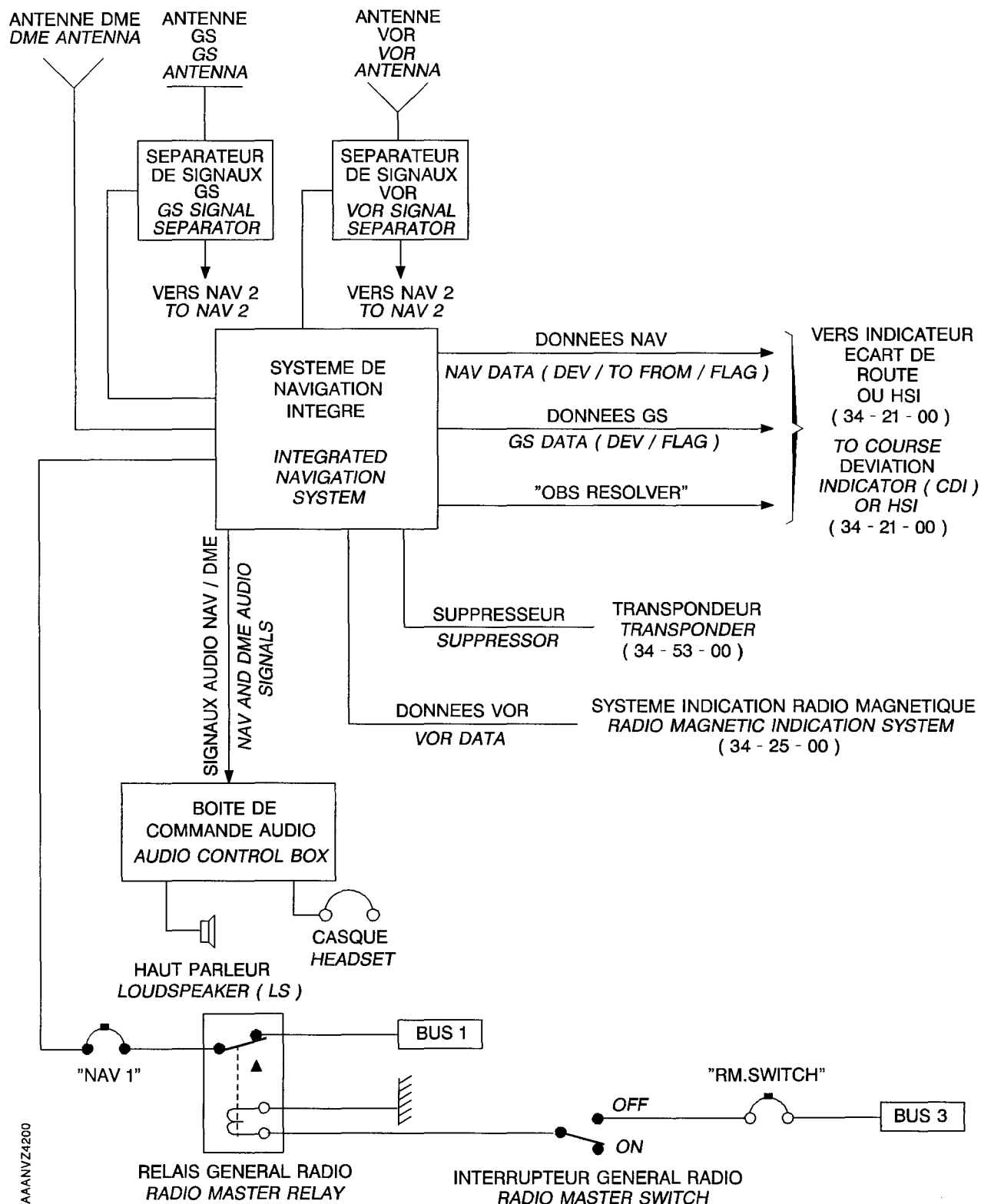
The system sends data to :

- the optional radio magnetic indication system - refer to 34-25-00,
- the optional autopilot system - refer to 22-10-00.

The integrated navigation system combines in a single unit a VOR / LOC receiver, a DME interrogator, an RNAV computer and a glideslope receiver.

The signal separator (option) permits operation of two receivers from one antenna.

The system is electrically supplied by "BUS 1" bar and protected by "NAV 1" circuit breaker.



NAV 1 Installation - Electrical schematic
Figure 1

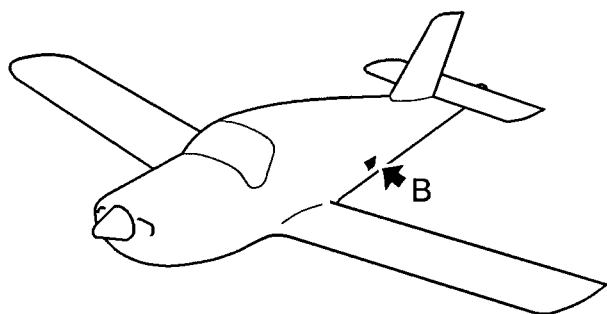
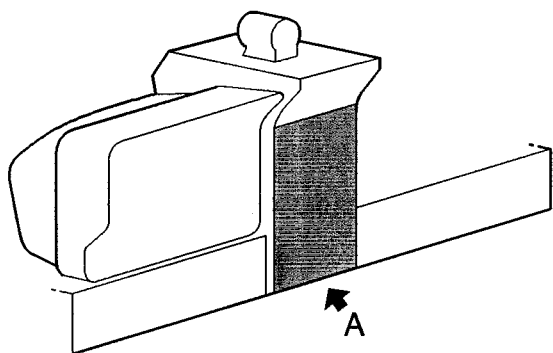
2. LOCATION (Figures 2, 3 and 4)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Integrated navigation system	1	251C	/	34-50-00
VOR signal separator (option)	1	251C	/	34-51-00
GS signal separator (option)	1	251C	/	34-51-00
VOR / LOC antenna	1	310	311 or 313	34-51-00
GS antenna	1	310	311 or 313	34-51-00
DME antenna	1	210	/	34-55-03
Course deviation indicator (option)	1	251L	/	34-51-00
Circuit breaker : - "NAV 1"	1	230	232L	WM

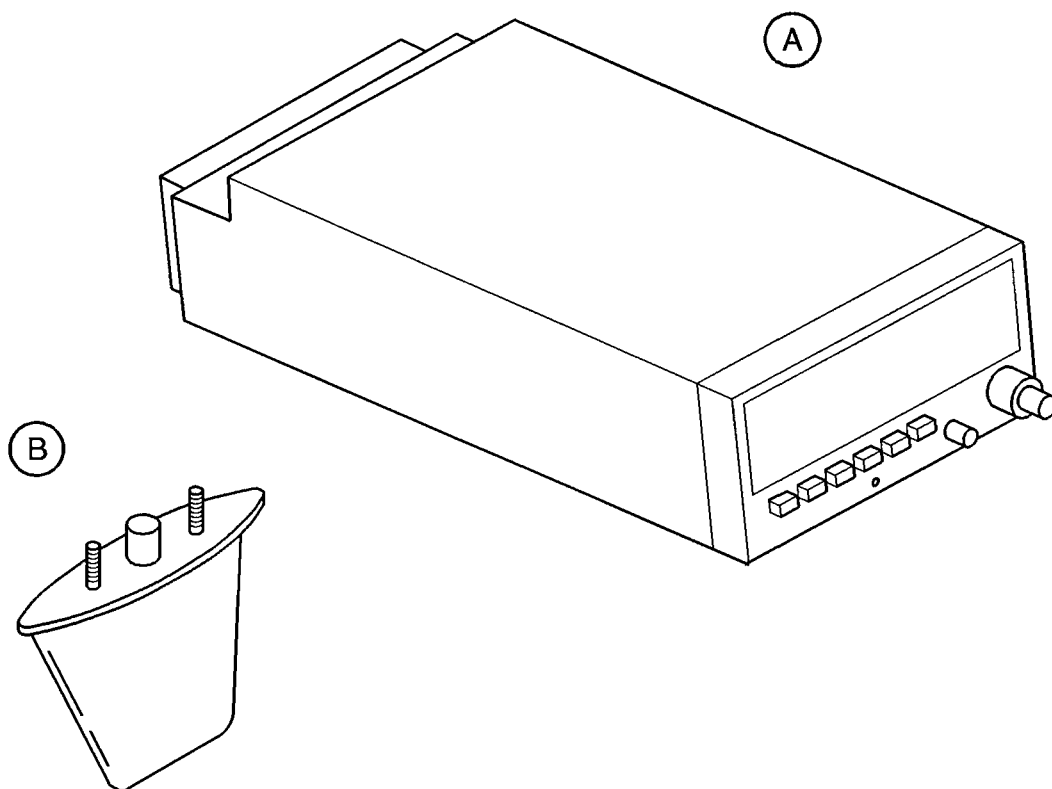
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

- A - Integrated navigation system
- B - DME antenna

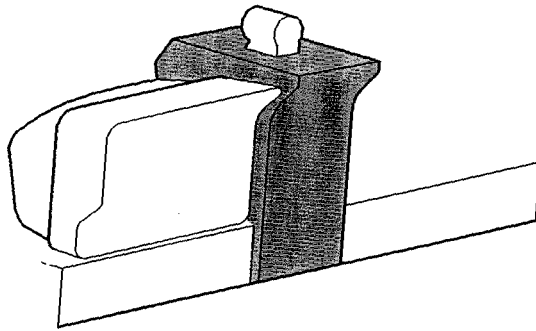


Variante de localisation
Alternate location

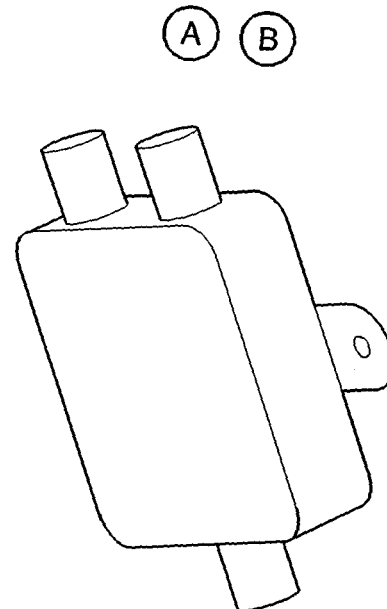
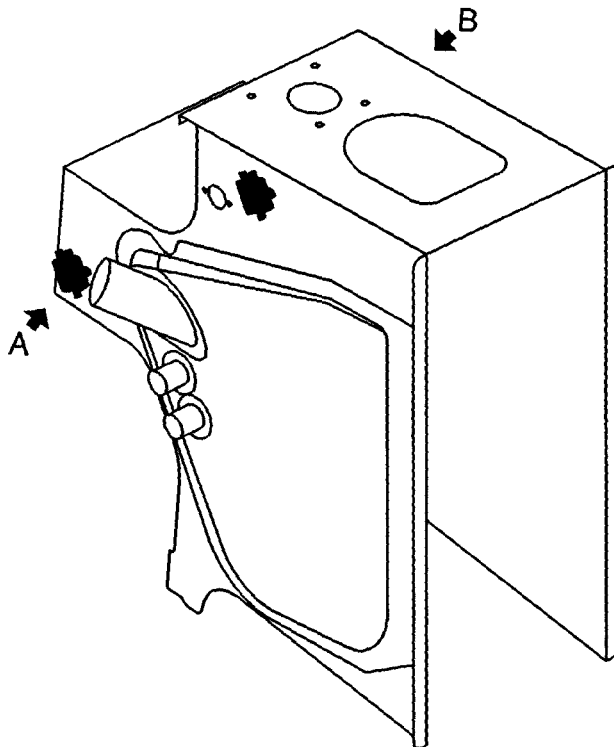


NAV 1 Installation - Identification and location of components
Figure 2

I4345100AAAGWZ4100



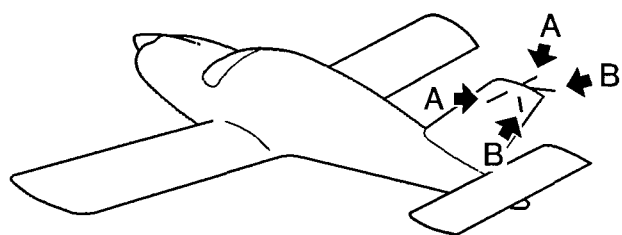
- A - VOR signal separator (option)
- B - GS signal separator (option)



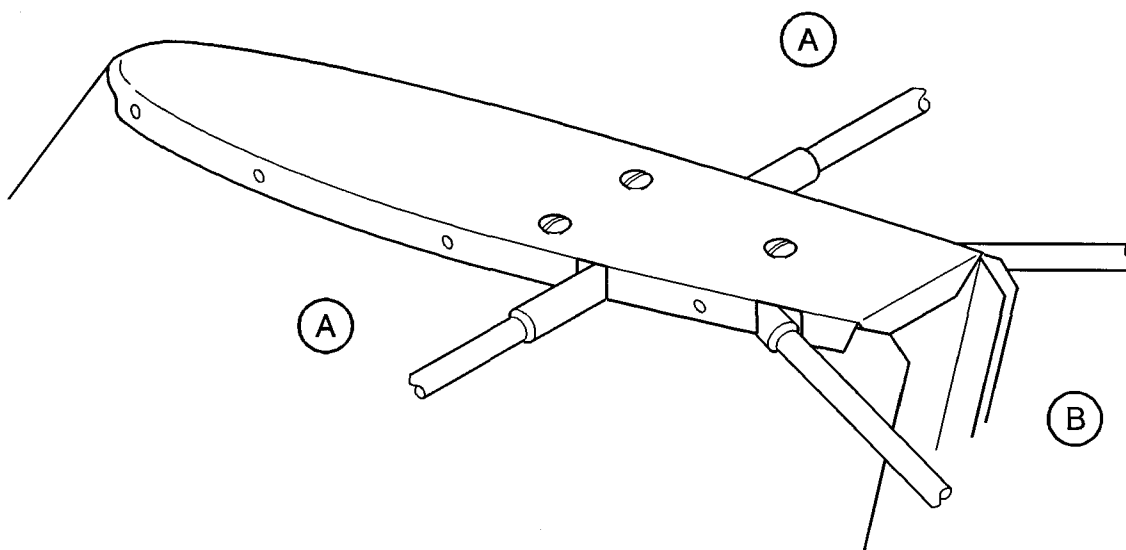
I4345100AAAPWZ4000

NAV 1 Installation - Identification and location of components
Figure 3

AHAH
Validity : KNS 80



A - GS antenna
B - VOR / LOC antenna



NAV 1 Installation - Identification and location of components
Figure 4

NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1 and 1A)

The VOR is a short- and middle-range navigation aid. It enables the pilot to locate the position of his aircraft with regard to a half-line (radial) crossing the VOR station or also to determine the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional system consists of the following elements :

- a VHF NAV / COMM transceiver,
- a VOR signal separator (option),
- a GS signal separator (option),
- a VOR / LOC antenna,

Option Pre-MOD. 151, Standard Post-MOD. 151

- a GS antenna,

All

- a course deviation indicator (CDI) (option).

Aircraft with HSI option

In this case, the CDI is not installed and the system uses the horizontal situation indicator of the heading reference system as indicator - refer to 34-21-00.

Aircraft with HSI interfaced with GPS system

In this case, the VHF NAV / COMM transceiver sends VOR / LOC and GS data through a switching unit (relay) to the HSI, using a NAV 1 / GPS switch annunciator - refer to 34-57-00.

All

The NAV 1 installation is connected with :

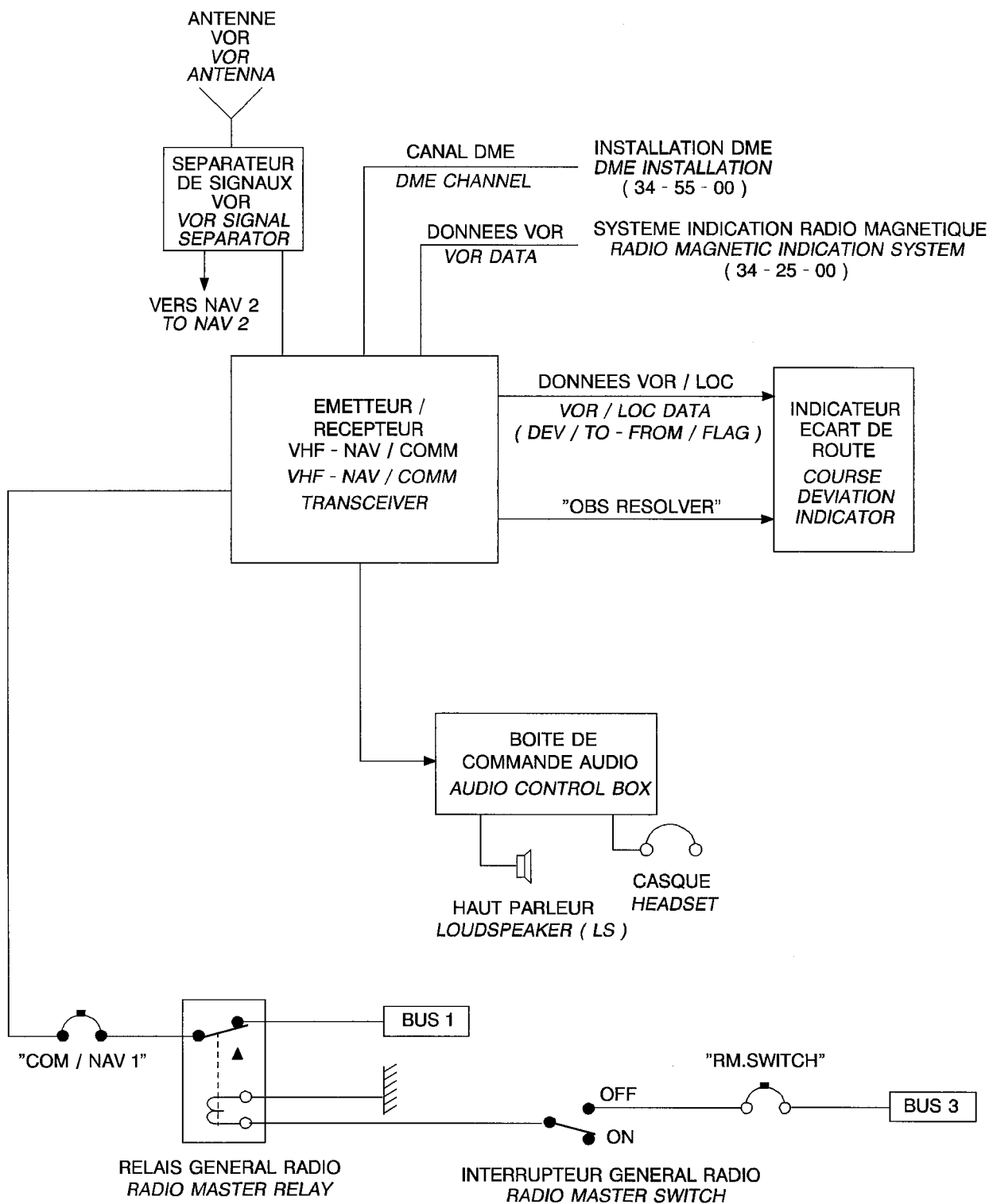
- the audio control box (option) - refer to 23-11-00,
- the DME installation (option) - refer to 34-55-00,
- the radio magnetic indication system (option) - refer to 34-25-00.

The VHF NAV / COMM transceiver combines, in a single unit, a VHF COM transceiver and a 200-channel VHF VOR / LOC receiver with a 40-channel glideslope receiver / converter option.

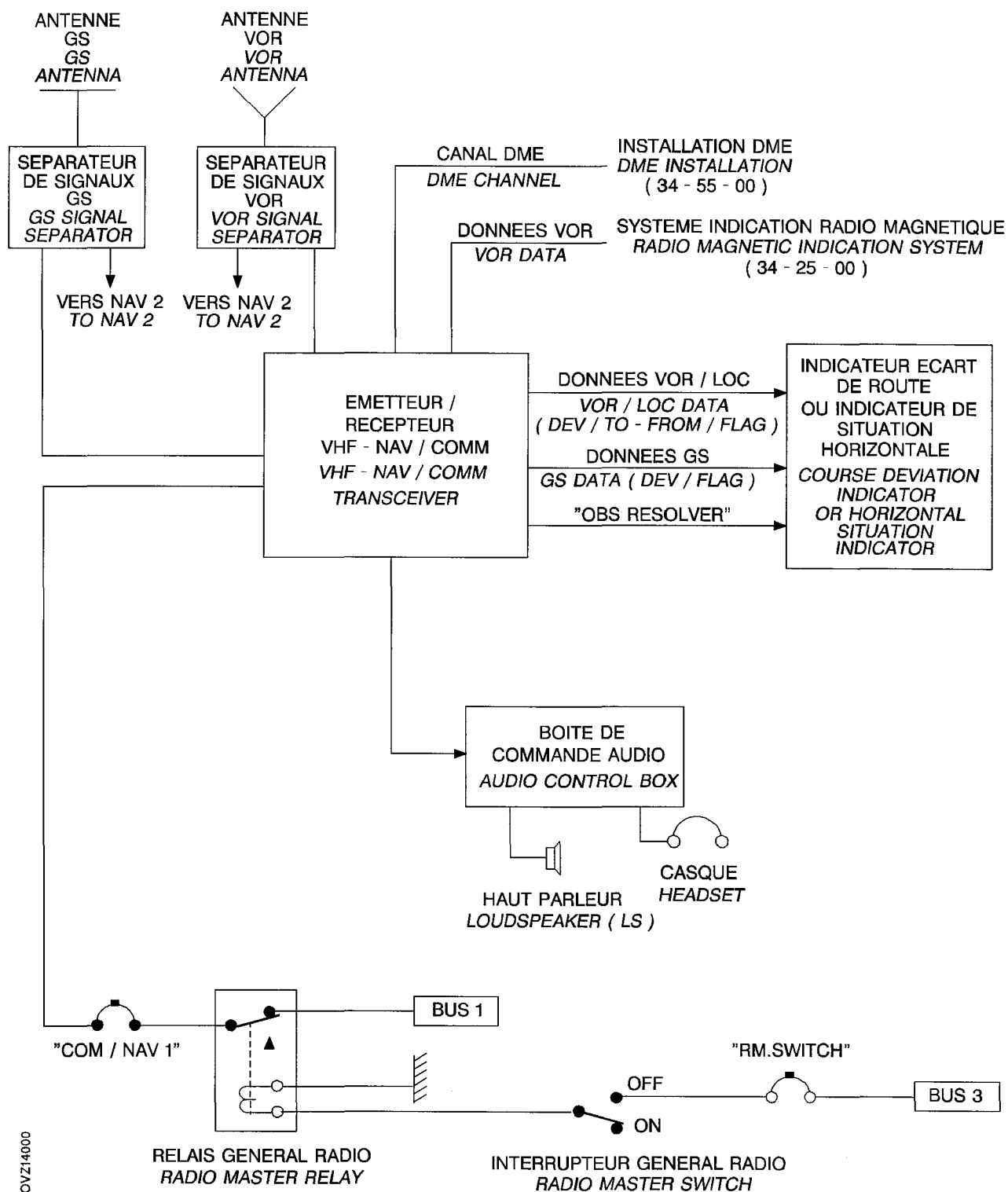
The CDI can include an UP / DOWN glideslope needle with an associated warning flag.

The signal separator (if installed) permits operation of two receivers from one antenna.

The system is electrically supplied by "BUS 1" bar via the "COM / NAV 1" circuit breaker.



NAV 1 Installation - Schematic
Figure 1 - Without glideslope



NAV 1 Installation - Schematic
Figure 1A - With glideslope

AIAI

Validity : KX 165 without EFIS

34-51-00 (CU)

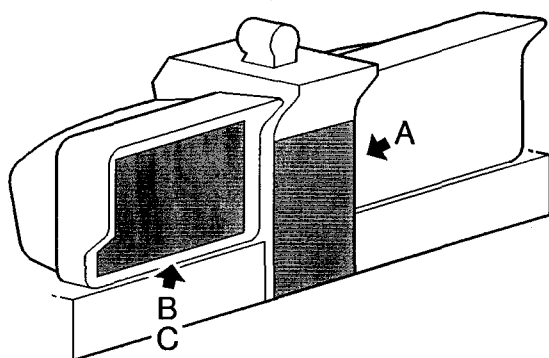
Page 3
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2. LOCATION (Figures 2, 3 and 4)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
VHF NAV / COMM transceiver	1	251C	/	34-50-00
Course deviation indicator (option)	1	251L	/	34-51-00
VOR signal separator (option)	1	251C	/	34-51-00
GS signal separator (option)	1	251C	/	34-51-00
VOR / LOC antenna	1	310	311 or 313	34-51-00
GS antenna	1	310	311 or 313	34-51-00
Circuit breaker : - "COM / NAV 1"	1	230	232L	WM

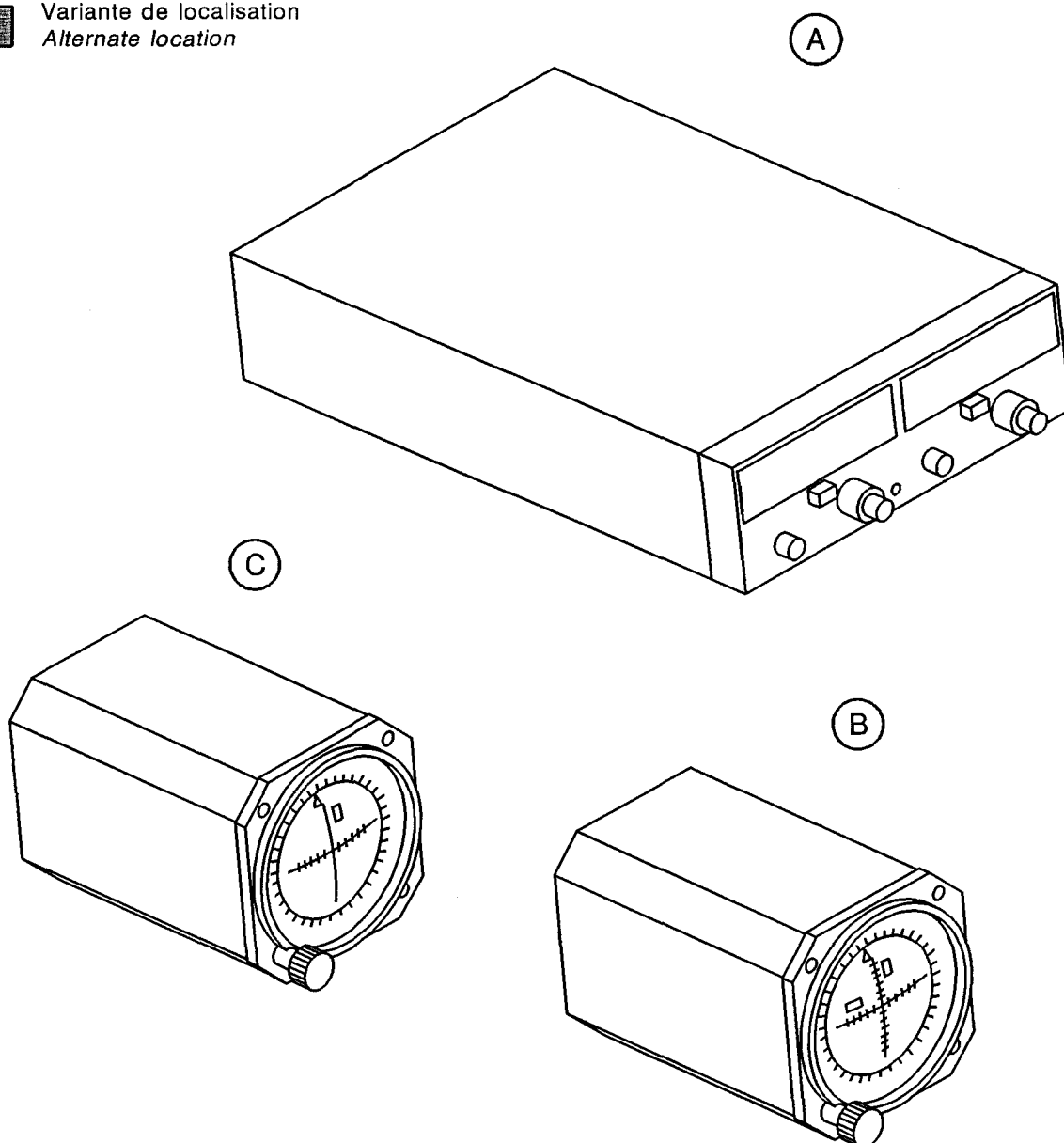
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

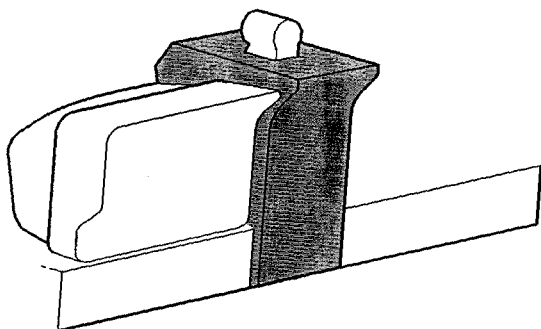


- A - VHF NAV / COMM transceiver
- B - Course deviation indicator (VOR / ILS information) (option)
- C - Course deviation indicator (VOR / LOC information) (option)

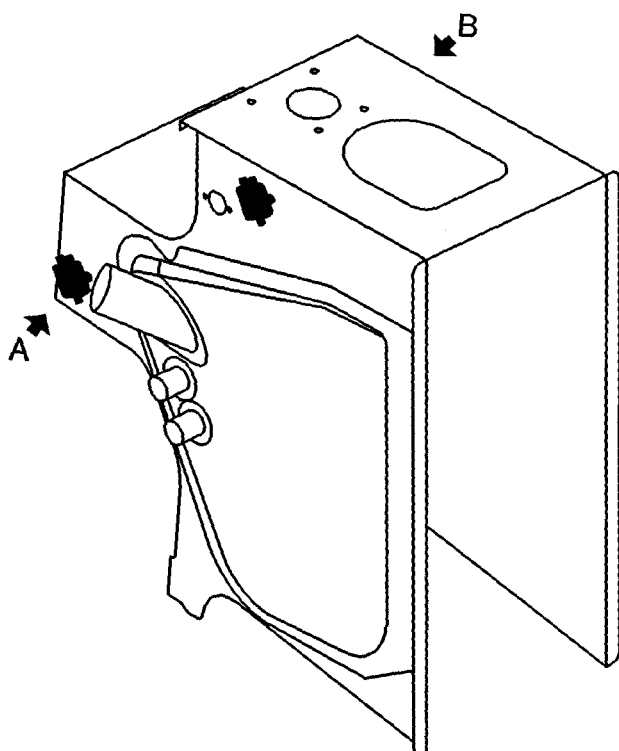
 Variante de localisation
Alternate location



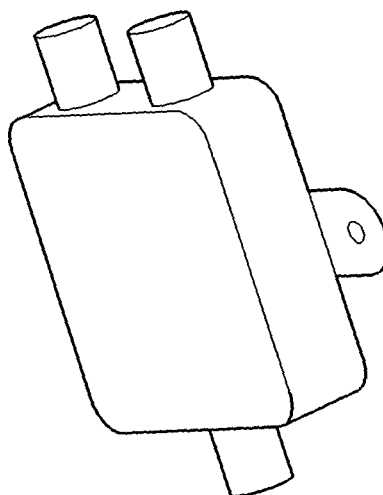
NAV 1 Installation - Identification and location of components
Figure 2



- A - VOR signal separator (option)
- B - GS signal separator (option)



(A) (B)



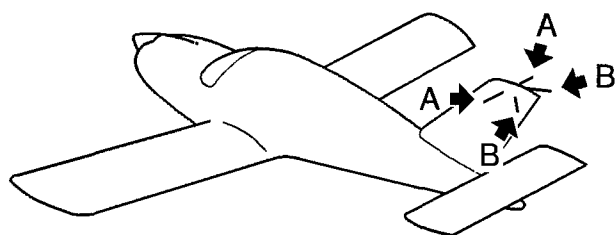
NAV 1 Installation - Identification and location of components
Figure 3

AIAI
Validity : KX 165 without EFIS

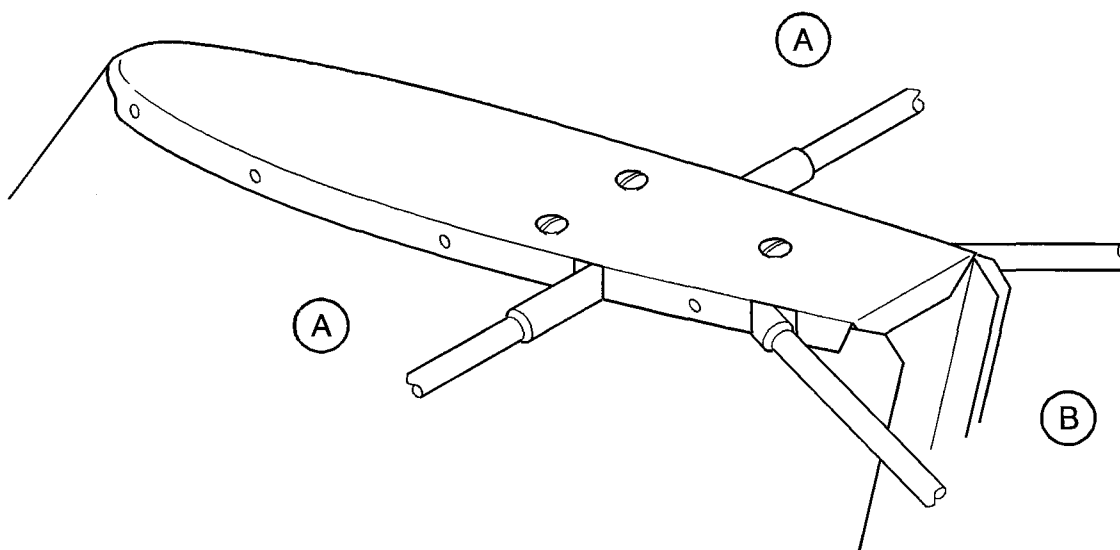
34-51-00 (CU)

Page 6
FEB 00

14345100AAA PWZ4000



- A - GS antenna
- B - VOR / LOC antenna



I4345100AAAQWZ4000

NAV 1 Installation - Identification and location of components
Figure 4

AIAI
Validity : KX 165 without EFIS

34-51-00 (CU)

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NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The VOR is a short- and middle-range radio-navigation aid. It allows the pilot to locate the position of his aircraft with regard to a half-line crossing the VOR station (radial) or also to know the particular radial crossing the aircraft position.

In LOC operation (landing aid), the system allows a continuous guidance in azimuth (LOC).

The optional system consists of the following elements :

- a VHF NAV / COMM transceiver,
- a course deviation indicator,
- a VOR / LOC antenna.

The system also uses :

- a "SPKR-PHONE" switch which allows the pilot to select audio signals either in the headsets only or simultaneously in the cabin loudspeaker and the headsets,
- a switch which allows the pilot to select application of the audio signals of the navigation systems (VOR, ADF or DME) to the loudspeaker and / or the headsets.

The system receives an audio signal from the optional ADF system - refer to 34-54-00, or from the optional DME system - refer to 34-55-00.

The VHF / NAV COMM transceiver combines in a single unit, a VHF COM transceiver and a 200-channel VHF VOR / LOC receiver.

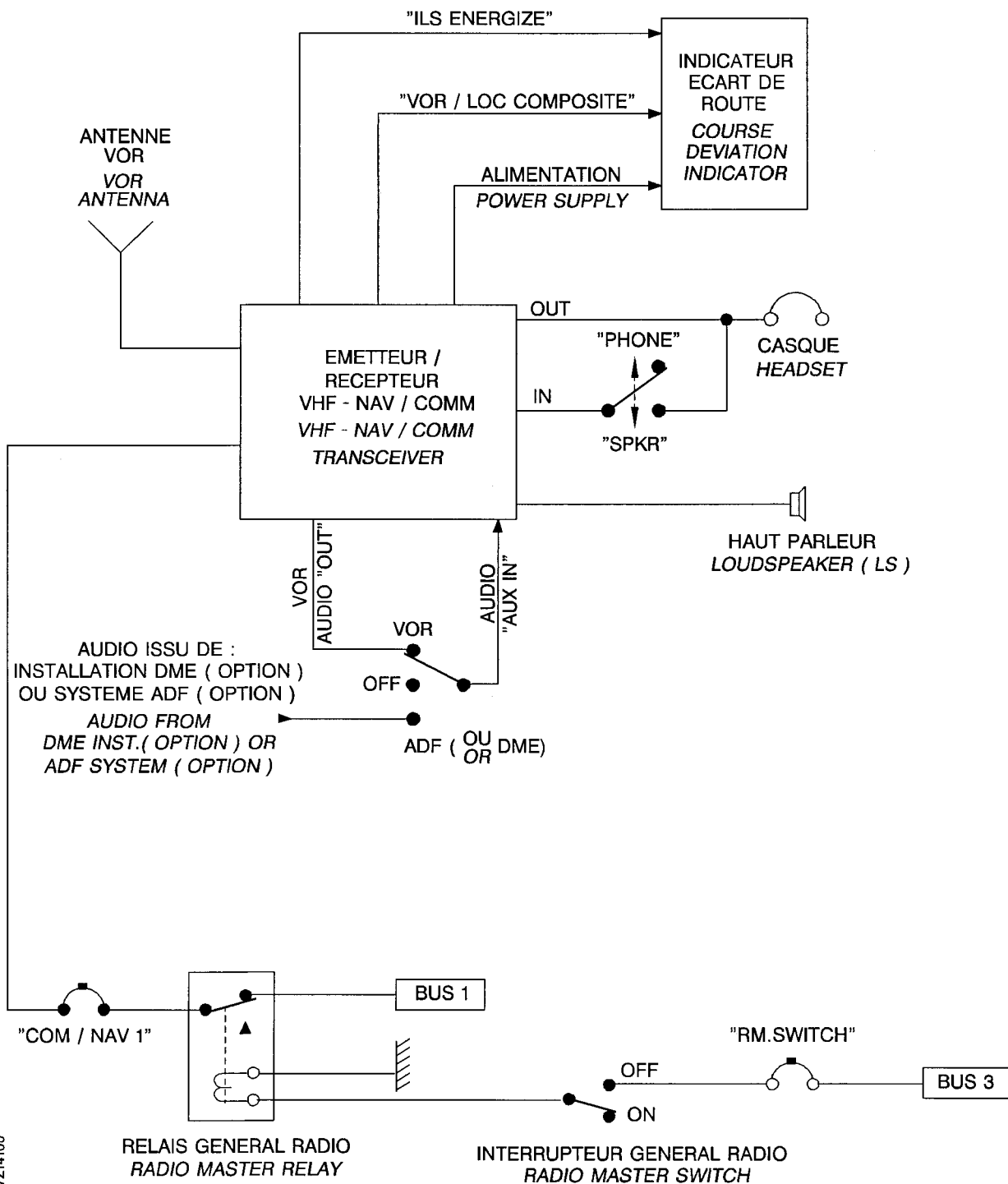
The system is electrically supplied by "BUS 1" bar via the "COM / NAV 1" circuit breaker.

2. LOCATION (Figures 2 and 3)

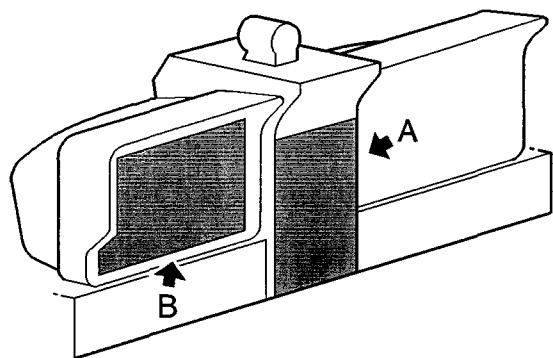
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
VHF NAV / COMM transceiver	1	251C	/	34-50-00
Course deviation indicator	1	251L	/	34-51-00
VOR / LOC antenna	1	310	311 or 313	34-51-00
Circuit breaker : - "COM / NAV 1"	1	230	232L	WM

3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

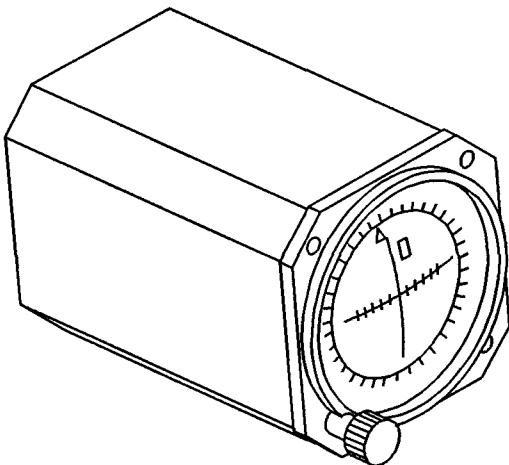
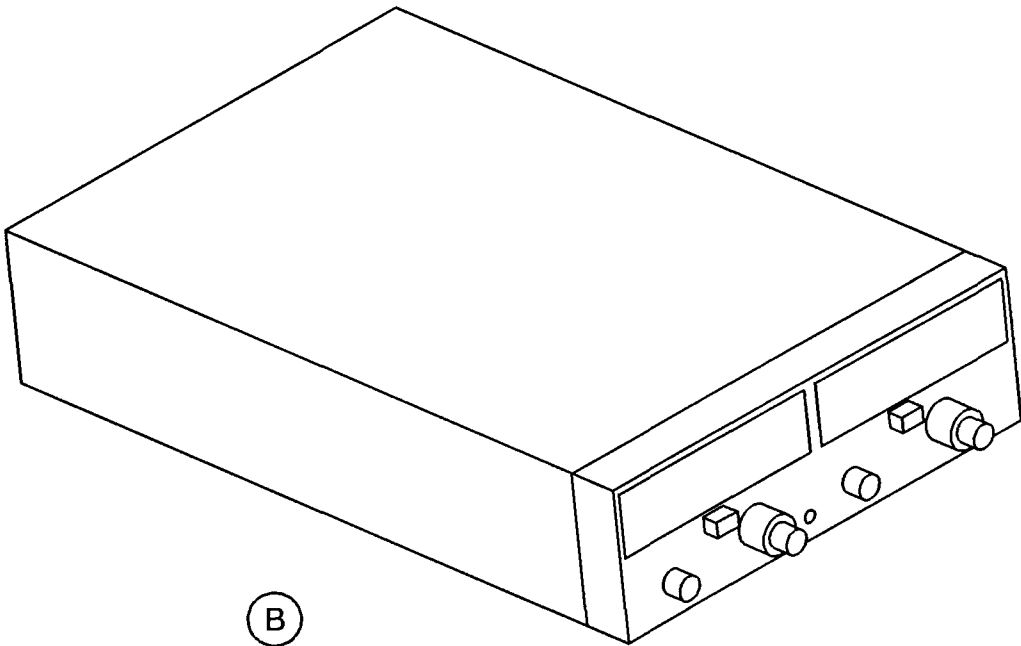


NAV 1 Installation - Electrical schematic
Figure 1

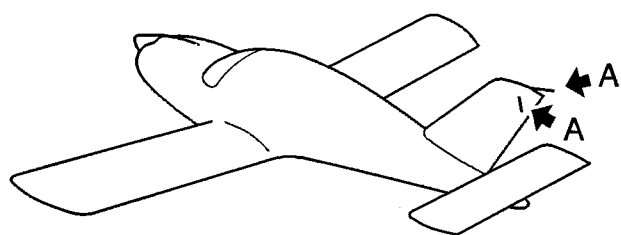


- A - VHF NAV / COMM transceiver
- B - Course deviation indicator

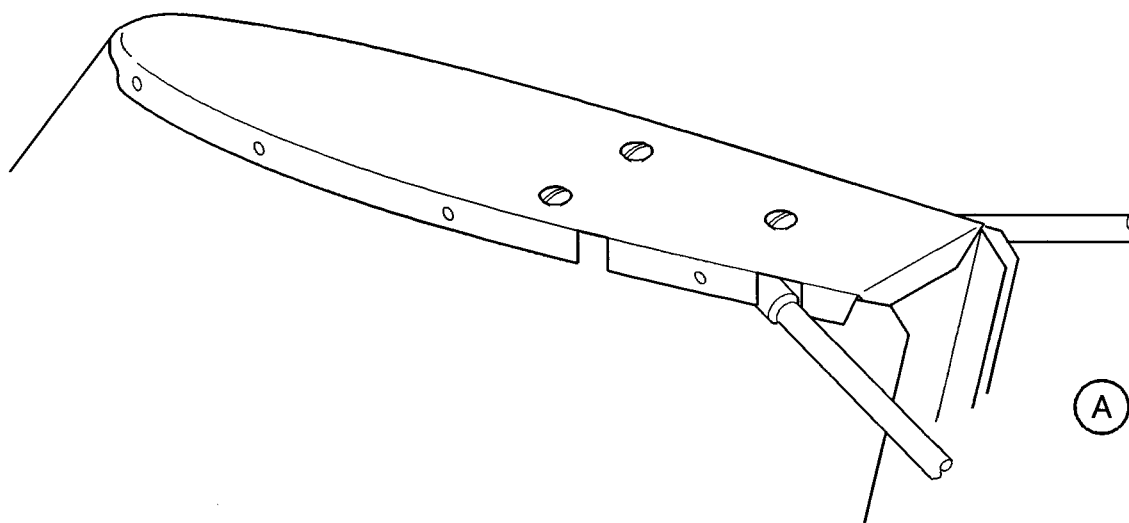
 Variante de localisation
Alternate location



NAV 1 Installation - Identification and location of components
Figure 2



A - VOR / LOC antenna



NAV 1 Installation - Identification and location of components
Figure 3

NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL

The VOR is a short- and middle-range navigation aid. It enables the pilot to locate the position of his aircraft with regard to a half-line (radial) crossing the VOR station or also to determine the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional system consists of the following elements :

- an A51 VHF NAV / COMM transceiver,
- an E33 VOR / LOC antenna,

Option Pre-MOD. 151. Standard Post-MOD. 151

- an E34 GS antenna,

All

- an A59 VOR signal separator (option),
- an A60 GS signal separator (option),
- a course deviation indicator (CDI) (option),
- or an A95 VOR / LOC converter (option) in conjunction with the horizontal situation indicator (HSI) of the heading reference system - refer to 34-21-00.

The NAV 1 installation is connected with :

- the audio control box (option) - refer to 23-11-00,
- the DME installation (option) - refer to 34-55-00,
- the radio magnetic indication system (option) - refer to 34-25-00,
- the autopilot system (option) - refer to 22-12-00.

The system is electrically supplied by "BUS 1" bar.

2. LOCATION (Figures 1, 2 and 3)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A51 VHF NAV / COMM transceiver	1	251C	/	34-50-00
E33 VOR / LOC antenna	1	310	311 or 313	34-51-00
E34 GS antenna (option or standard)	1	310	311 or 313	34-51-00
A59 VOR signal separator (option)	1	251C	/	34-51-00
A60 GS signal separator (option)	1	251C	/	34-51-00
Course deviation indicator (option)	1	251L	/	34-51-00
A95 VOR / LOC converter (option)	1	230	Under pilot's seat	34-51-00
Circuit breaker : - "COM / NAV 1"	1	230	232L	WM

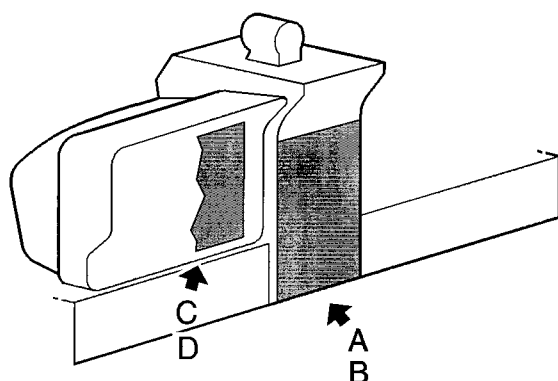
3. DESCRIPTION**A. A51 VHF NAV/COMM. transceiver (Figure 4)**

The VHF NAV/COMM. transceiver is designed for the reception of navigation and guidance signals within a frequency range from 108.00 to 117.95 MHz and as an option for the reception of Glide Slope signals within a frequency range from 329.15 to 335.00 MHz. It provides the indicator(s) with NAV/LOC or NAV/ILS information.

Aircraft with KX 155A

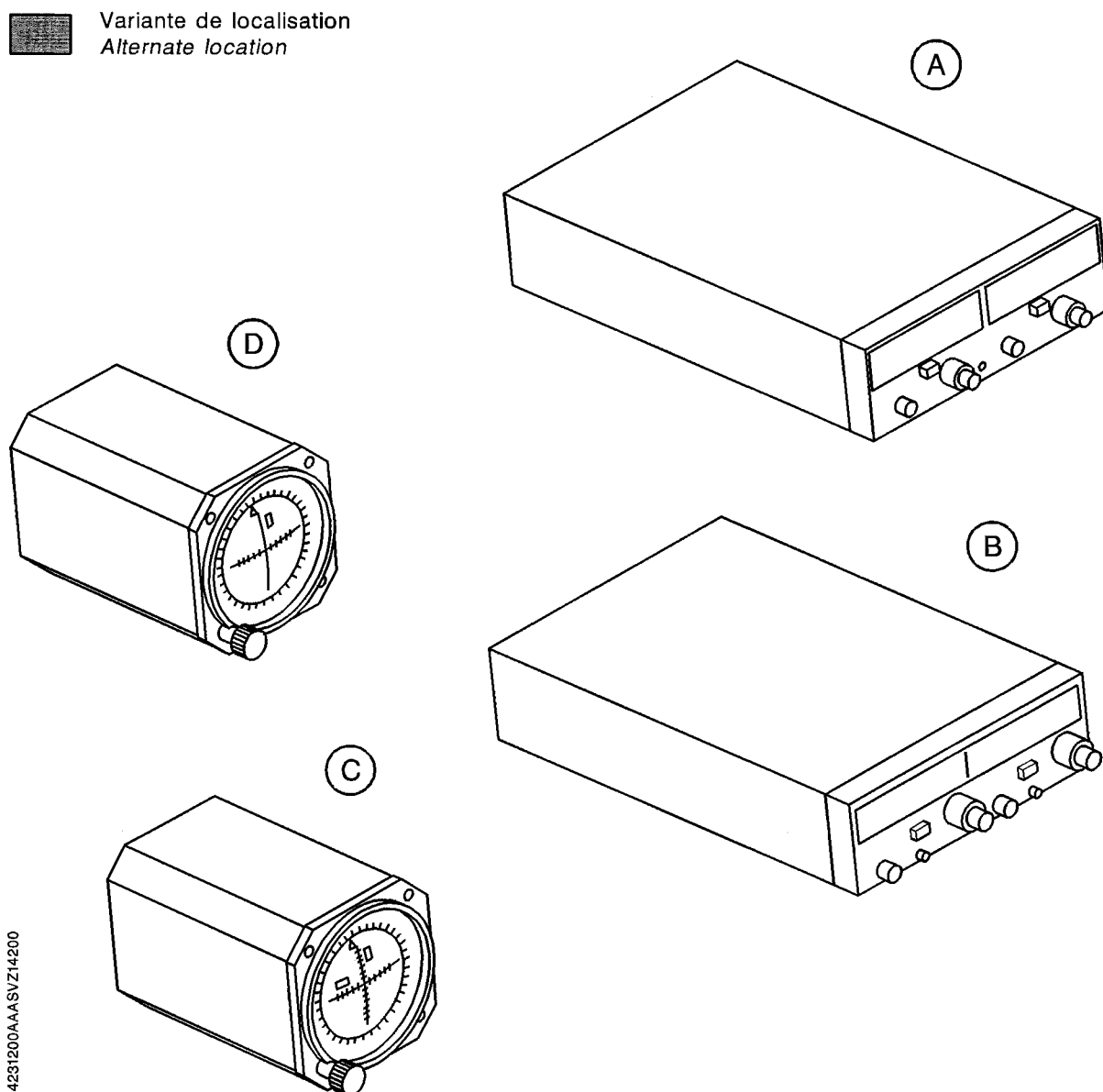
All the controls, necessary for equipment operation in navigation mode as well as display, are located on the R.H. section of front panel. It includes :

- the NAV digital display (1) subdivided in two windows. The left window always displays the active frequency and the right "STBY" window displays the standby frequency or, according to the selected mode, navigation information,
- two concentric knobs used to select the active frequency, the standby frequency or data entry according to the selected mode,
- the "↔" pushbutton for NAV frequency transfer, which enables the frequency displayed in the active frequency window to flip-flop with the frequency displayed in the "STBY" window and vice-versa. When pushed in more than two seconds, it also enables the active frequency to be directly controlled via the concentric knobs (if you press momentarily the pushbutton, the active and standby frequency display mode is reactivated),
- the "MODE" pushbutton used to select the CDI, the BEARING or RADIAL mode,
- the "PULL IDENT" button. When this button is pulled out, the identification code of the ground station sounds through A50 audio control panel. To adjust the audio level, rotate this button. When the "PULL/IDENT" button is pushed in, the identification code is attenuated,



 Variante de localisation
Alternate location

- A - A51 VHF NAV/COMM. transceiver (KX 155)
- B - A51 VHF NAV/COMM. transceiver (KX 155A)
- C - Course deviation indicator (option) (VOR/ILS information)
- D - Course deviation indicator (option) (VOR/LOC information)



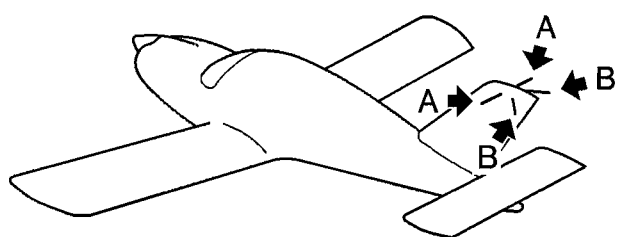
NAV 1 installation - Identification and location of components
Figure 1

AKAK

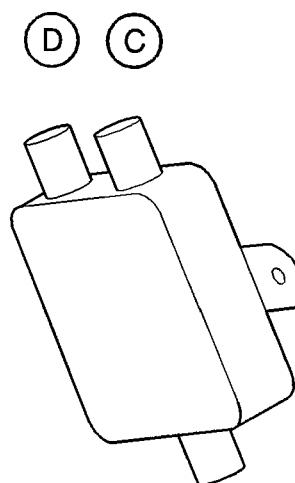
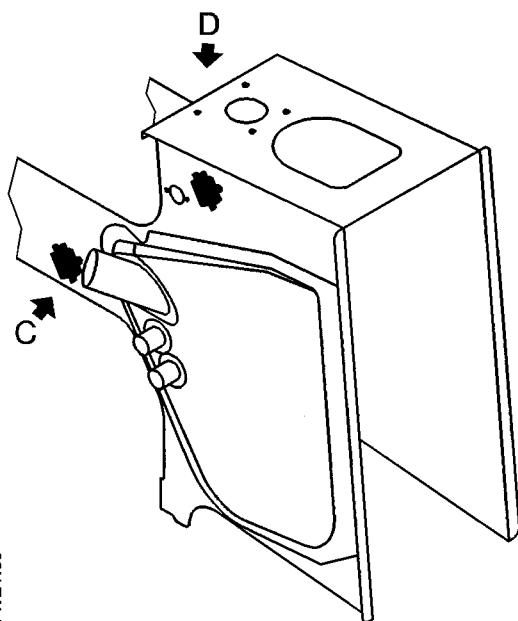
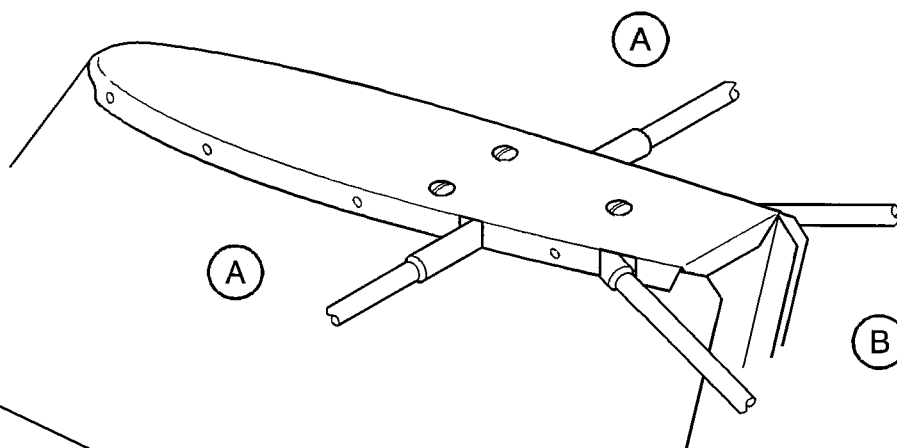
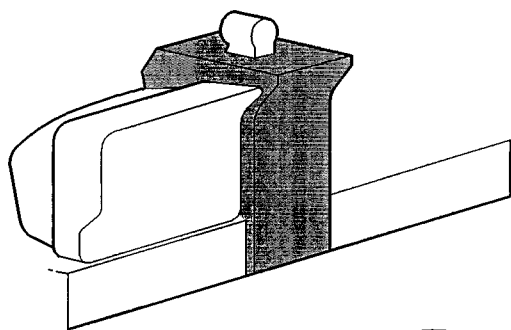
Validity : KX 155 - KX 155A with audio control panel

34-51-00 (DE)

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- A - E34 GLIDE antenna (option or standard)
- B - E33 VOR/LOC antenna
- C - A59 VOR signal separator (option)
- D - A60 GS signal separator (option)



NAV 1 installation - Identification and location of components
Figure 2

14345100AAAPWZ4100

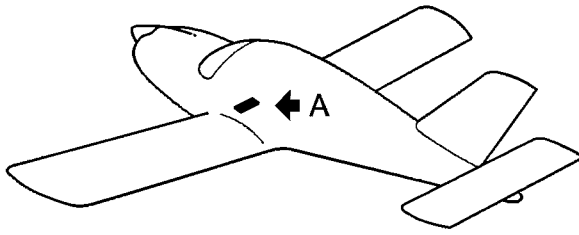
AKAK

Validity : KX 155 - KX 155A with audio control panel

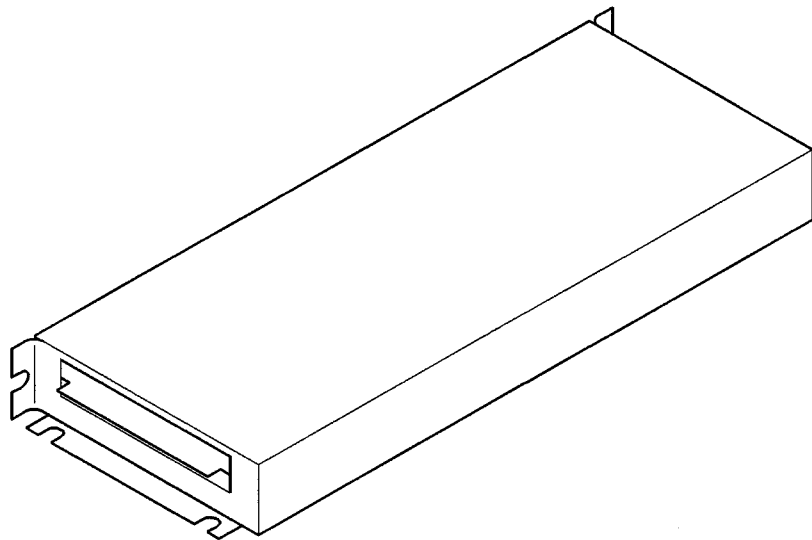
34-51-00 (DE)

Page 4
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A - A95 VOR/LOC converter (option)



(A)



14345500AAAAMWZ4000

NAV 1 installation - Identification and location of components
Figure 3

AKAK

Validity : KX 155 - KX 155A with audio control panel

34-51-00 (DE)

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NOV 01

- the "OFF/PULL TEST" button which energizes the VHF NAV/COMM transceiver.

All

The VHF NAV/COMM. transceiver is electrically supplied by "BUS 1" bar via the radio master relay (if installed) and protected by CB 86 "COM/NAV 1" circuit breaker.

The VHF NAV/COMM. transceiver is mounted on the radio rack.

B. E33 VOR/LOC antenna

The "V" type VOR/LOC antenna consists of two radiants mounted horizontally on each side of the vertical stabilizer. It enables reception of signals within 108 MHz to 118 MHz frequency range.

C. E34 GS antenna

The GS antenna consists of two radiants mounted horizontally on each side of the vertical stabilizer. It enables reception of signals within 329 MHz to 335 MHz frequency range.

D. A59 VOR signal separator (option)

The signal separator is used to couple NAV 1 and NAV 2 installations with the VOR/LOC antenna.

It consists of a rectangular box fitted with two attachment tabs. It features 3 BNC connectors.

It is mounted on the L.H. side of the radio rack.

E. A60 GS signal separator (option)

The signal separator is used to couple NAV 1 and NAV 2 installations with the GS antenna.

It consists of a rectangular box fitted with two attachment tabs. It features 3 BNC connectors.

It is mounted on the R.H. side of the radio rack.

F. Course deviation indicator (option)

The indicator displays Glide Slope information and the converted VOR/LOC information provided by the VHF NAV/COMM. transceiver.

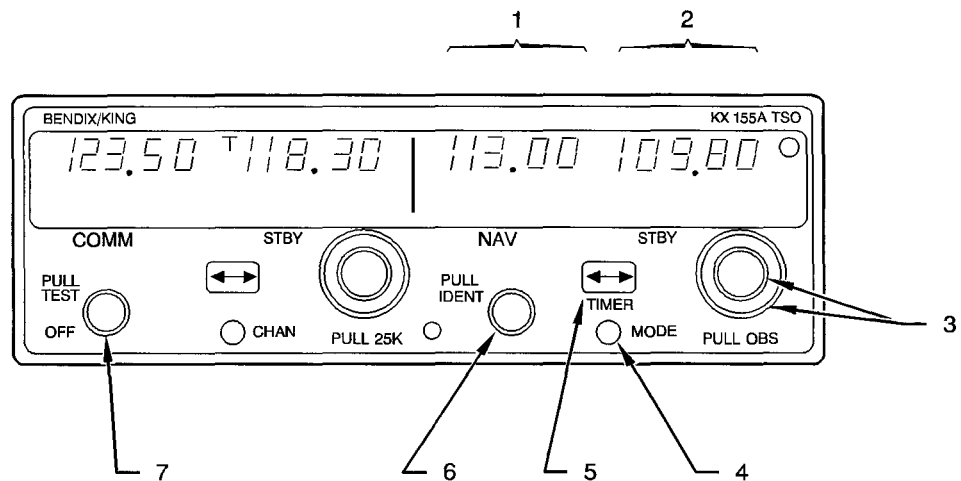
The front panel of the indicator includes :

- the "OBS" button used to adjust the desired radial under the lubber line by moving the compass card,
- the horizontal pointer (option) showing the Glide Slope course position relative to aircraft position,
- the vertical pointer showing VOR course deviation or LOC course position relative to aircraft position,
- the "TO/FR" flag showing "TO" if the aircraft flies towards the selected ground station or "FR" when it flies in the opposite direction.
- the "VOR/LOC" warning flag which appears to show that the received signals cannot be used.
- the Glide Slope warning flag (option) which appears to show that the received signals cannot be used.

It is electrically supplied by the VHF NAV/COMM. transceiver.

The indicator is mounted on the L.H. instrument panel.

- 1 - Active frequency window
- 2 - "STBY" window, standby frequency
- 3 - Concentric knobs
- 4 - "MODE" pushbutton
- 5 - "↔" pushbutton
- 6 - "PULL IDENT" button
- 7 - "OFF/PULL TEST" button



NAV 1 installation – A51 VHF NAV/COMM. transceiver
Figure 4 - KX 155A

14231200AAA SVZ4101

AKAK

Validity : KX 155 - KX 155A with audio control panel

34-51-00 (DE)

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G. A95 VOR/LOC converter (option)

The VOR/LOC converter is a signal converter which operates with the VHF NAV/COMM. transceiver and an indicator to provide omnidirectional (VOR) and azimuth guidance (LOC) information.

Navigation information given by the VHF NAV/COMM. transceiver (composite signal) is converted into DC signals to control the horizontal pointer, the TO/FROM indicator and the paired warning flag of the Horizontal Situation Indicator (HSI).

The VOR/LOC converter is electrically supplied by the VHF NAV/COMM. transceiver.

The VOR/LOC converter is mounted under the pilot's seat.

4. OPERATION (Figures 5, 5A and 5B)

The "RADIO MASTER" switch enables the energization of the entire radionavigation system.

A. VOR/LOC mode

The VHF NAV/COMM. transceiver is tuned to the frequency displayed in the active frequency window of the NAV display. The VOR/LOC signal is received by the antenna and transmitted to the VHF NAV/COMM. transceiver via the VOR signal separator. The transceiver detects and amplifies the signal to produce a composite VOR/LOC signal.

Aircraft with course deviation indicator

The course deviation indicator receives this signal and converts into DC signals to control the vertical pointer, the "TO/FR" flag and the paired warning flag.

Aircraft with VOR/LOC converter

From the composite signal and in accordance with the selected course (Radial) on the horizontal situation indicator (HSI), the converter sets :

- the LH/RH course deviation with relation to the selected radial,
- the TO/FROM indication,
- the control of the vertical pointer flag.

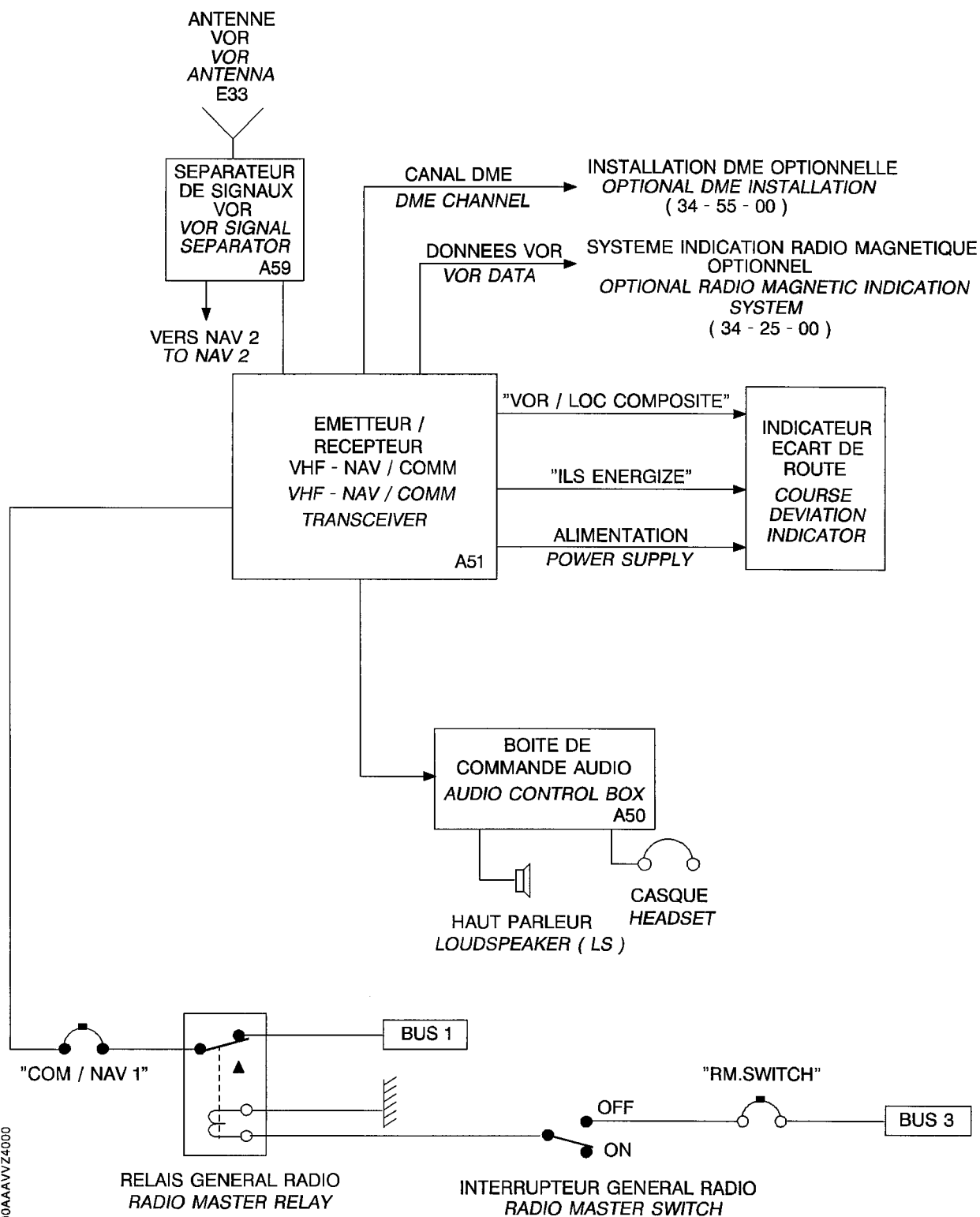
The information are transmitted directly to the HSI or via a switching relay when the HSI also displays information provided by the GPS system.

All

The transceiver processes the audio identification signal provided by the VOR ground station and transmits it to the A50 audio control panel.

B. Glide Slope mode (option)

When a LOC frequency is set on the VHF NAV/COMM. transceiver, the internal GS receiver automatically tunes to the paired Glide Slope frequency. The signal is received by the Glide Slope antenna and transmitted to the VHF NAV/COMM. transceiver via the GS signal separator. The VHF NAV/COMM. transceiver detects and amplifies the signal to produce a composite signal to control the horizontal pointer and the paired warning flag of the course deviation indicator or of the horizontal situation indicator (HSI).



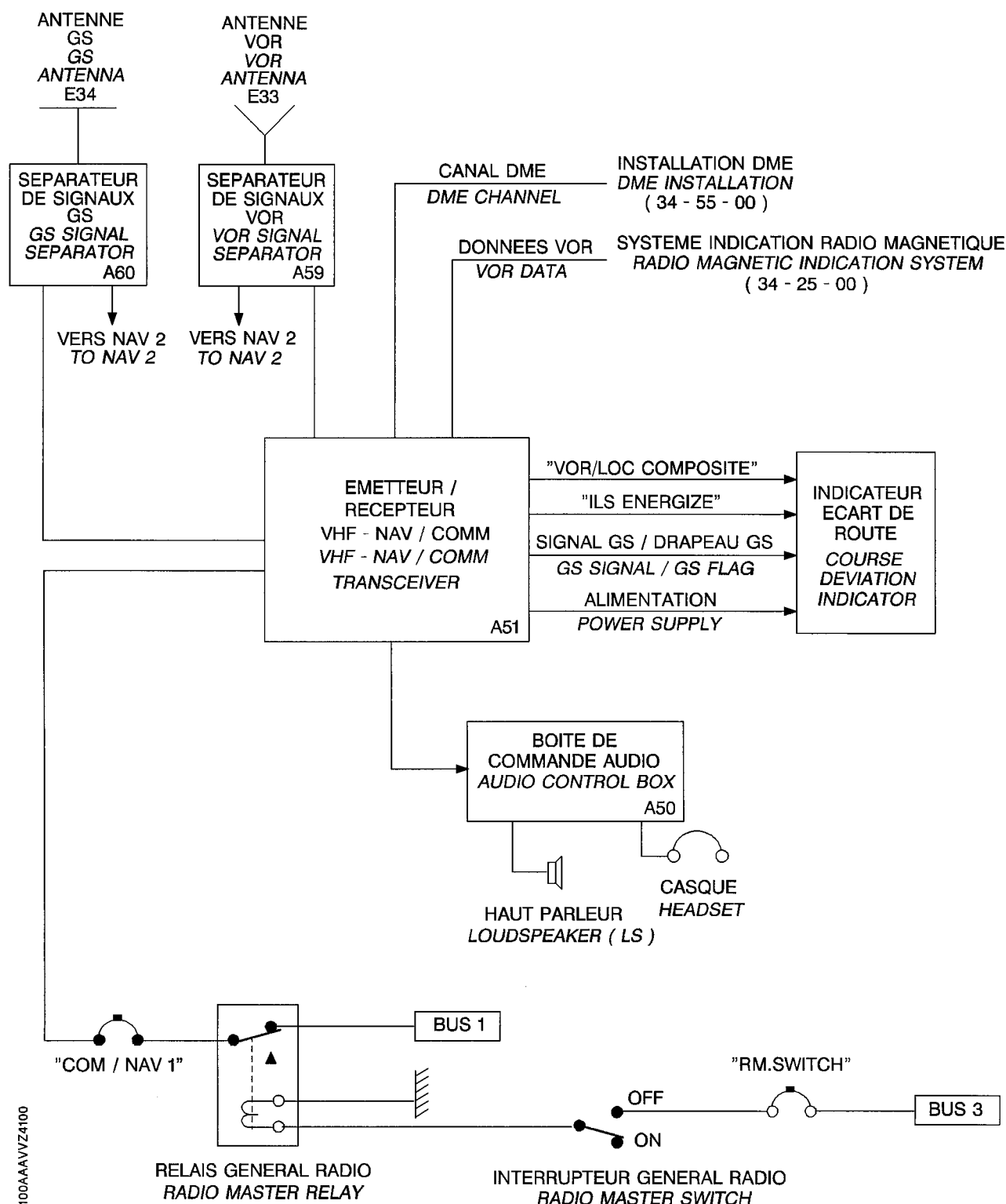
NAV 1 installation - Schematic
Figure 5 - Without GLIDE slope receiver

AKAK

Validity : KX 155 - KX 155A with audio control panel

34-51-00 (DE)

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NOV 01



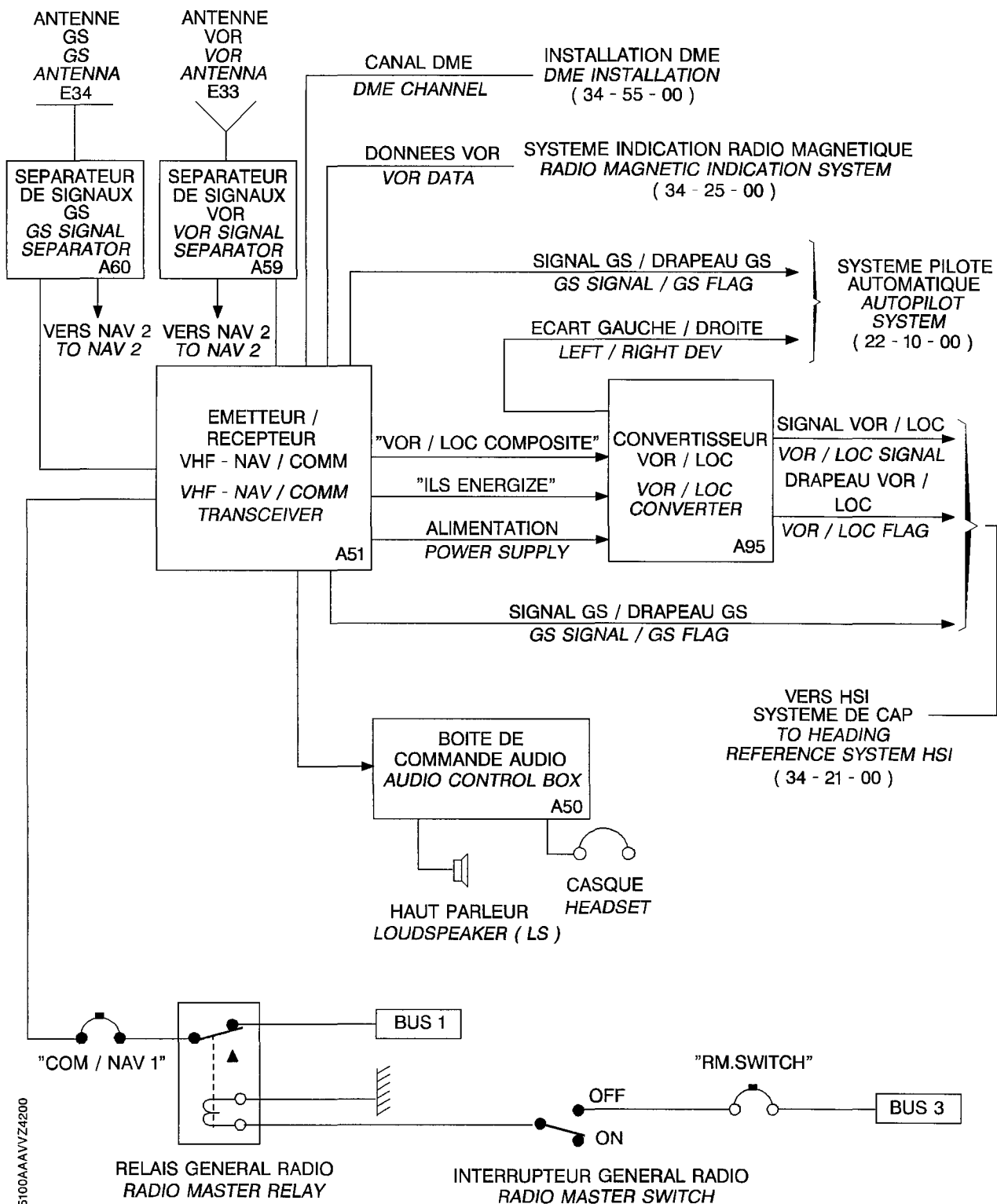
NAV 1 installation - Schematic
Figure 5A - With GLIDE slope receiver

AKAK

Validity : KX 155 - KX 155A with audio control panel

34-51-00 (DE)

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NOV 01



NAV 1 installation - Schematic
Figure 5B - With A95 VOR/LOC converter

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Validity : KX 155 - KX 155A with audio control panel

34-51-00 (DE)

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Validity : KX 155 - KX 155A with audio control panel

34-51-00 (DE)

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NOV 01

NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL

The VOR is a short- and middle-range navigation aid. It enables the pilot to locate the position of his aircraft with regard to a half-line (radial) crossing the VOR station or also to determine the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional NAV 1 installation consists of :

- the A78 COMM./VOR-ILS/GPS transceiver GNS 430
- the E33 VOR/LOC antenna,

Optional Pre-MOD 151, Standard Post-MOD 151

- the E34 GS (GLIDE) antenna,

All

- the A59 VOR signal separator (option),
- the A60 GS signal separator (option),
- the M81 course deviation indicator GI 106A
- or the M73 Horizontal Situation Indicator (HSI) KI 525A

The M73 horizontal situation indicator is a component of the heading system – refer to 34-21-00.

The installation uses the M6 advisory panel – refer to 31-50-00.

With relation to the options installed on the aircraft, NAV 1 installation receives and/or sends signals to :

- the A50 audio control panel – refer to 23-11-00,
- the Distance Measuring Equipment (DME) – refer to 34-55-00,
- the Radio Magnetic Indicator (RMI) – refer to 34-25-00,
- the transponder (GTX 327) – refer to 34-53-00,
- the multifunction display – refer to 34-62-00,
- the fuel flow totalizer – refer to 73-30-00,
- the autopilot system – refer to 22-12-00.

For the description of the communication function of the A78 COMM./VOR-ILS/GPS transceiver, refer to 23-12-00.

For the description of the GPS function of the A78 COMM./VOR-ILS/GPS transceiver, refer to 37-57-00.

The installation is electrically supplied by "BUS 1" bar.

2. LOCATION (Figures 1 and 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 COMM./VOR-ILS/GPS transceiver	1	PL30	/	34-50-00
E33 VOR/LOC antenna	1	310	311 or 313	34-51-00
E34 GS antenna (Option or Standard)	1	310	311 or 313	34-51-00
A59 VOR signal separator (option)	1	251C	/	34-51-00
A60 GS signal separator (option)	1	251C	/	34-51-00
M81 course deviation indicator	1	251L	/	34-51-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - CB 87 "NAV 1/GPS 1"	1	PL1	/	WM

3. DESCRIPTION

A. A78 COMM./VOR-ILS/GPS transceiver (Figure 3)

The COMM./VOR-ILS/GPS transceiver is designed for the reception of navigation and guidance signals within a frequency range from 108.00 to 117.95 MHz and reception of GS signals within a frequency range from 329.15 to 335.00 MHz. It provides M73 HSI or M81 course deviation indicator with NAV/ILS information.

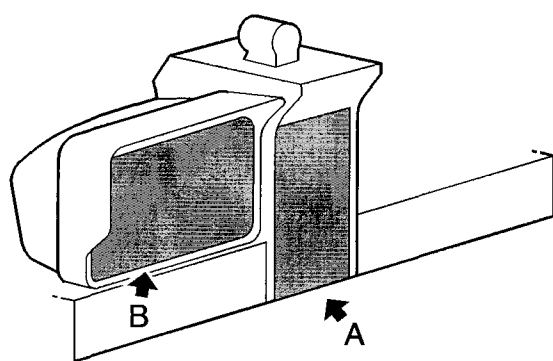
The COMM./VOR-ILS/GPS transceiver is a rectangular box installed in an attachment rack. Connections are made through three electrical connectors and four antenna connectors on the back panel.

For the VOR/ILS functions, the front panel includes :

- the display (1) subdivided in three windows. The window (3) relative to VOR/ILS functions is located in the lower L.H. part of the display. The active frequency and below it, the standby frequency are displayed in this window.
- the ".C" button (7) used to energize the equipment,
- the ".V" button (6) used to adjust the audio level and select the identification code of the ground station,
- the "V<->" pushbutton (5) used to enable the frequency displayed in the active frequency window to flip-flop with the frequency displayed in the "STBY" window and vice-versa,
- two concentric knobs (4) used to modify standby frequency when the cursor function is enabled. If necessary, press momentarily the inner concentric knob to activate cursor function,
- the "CDI" pushbutton (2) used to direct the selected VOR/ILS or GPS information source towards M73 HSI or towards the M81 course deviation indicator.

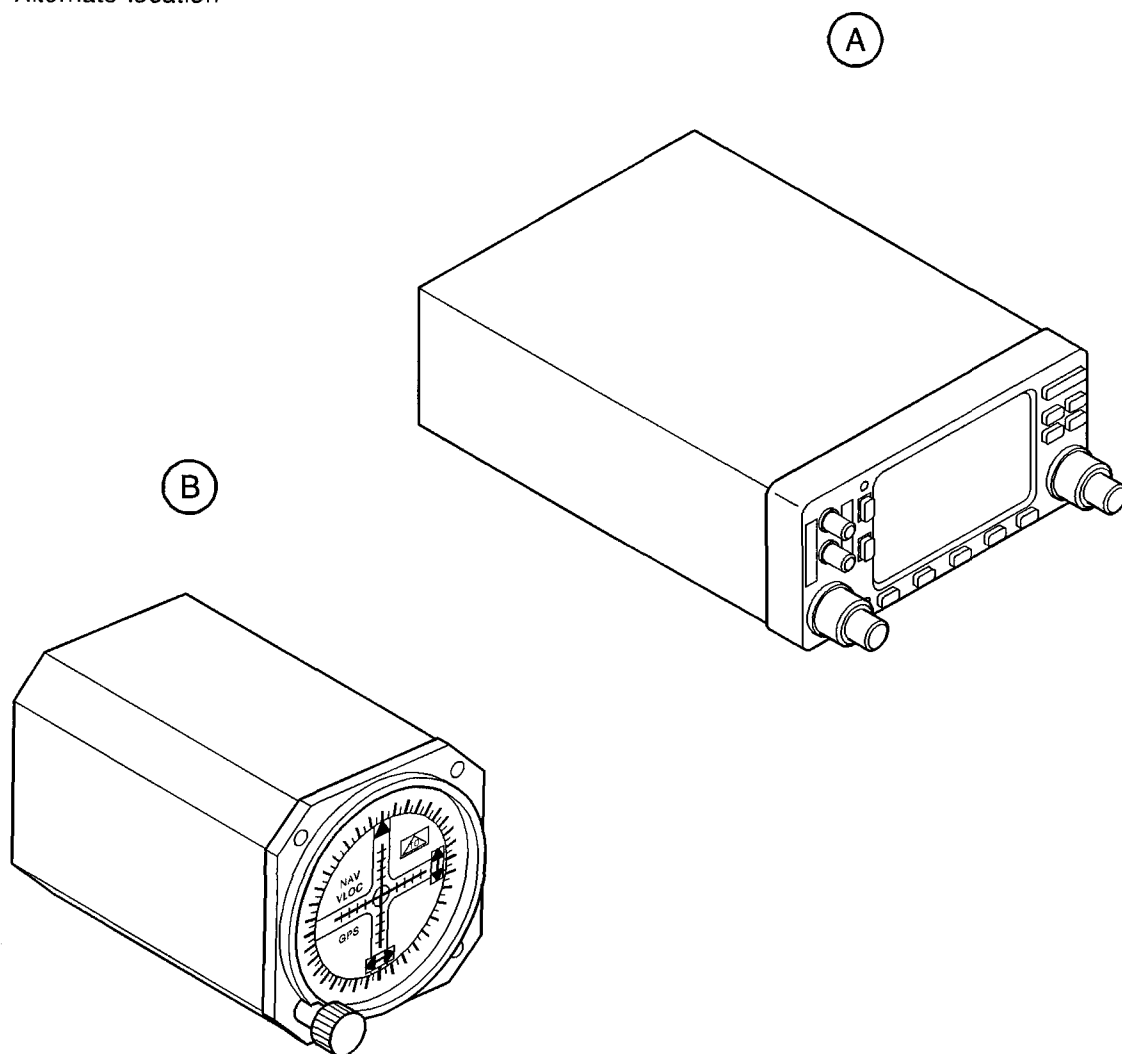
The COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar and protected by CB 87 "NAV 1/GPS 1" circuit breaker.

The COMM./VOR-ILS/GPS transceiver is mounted on PL30 radio rack.



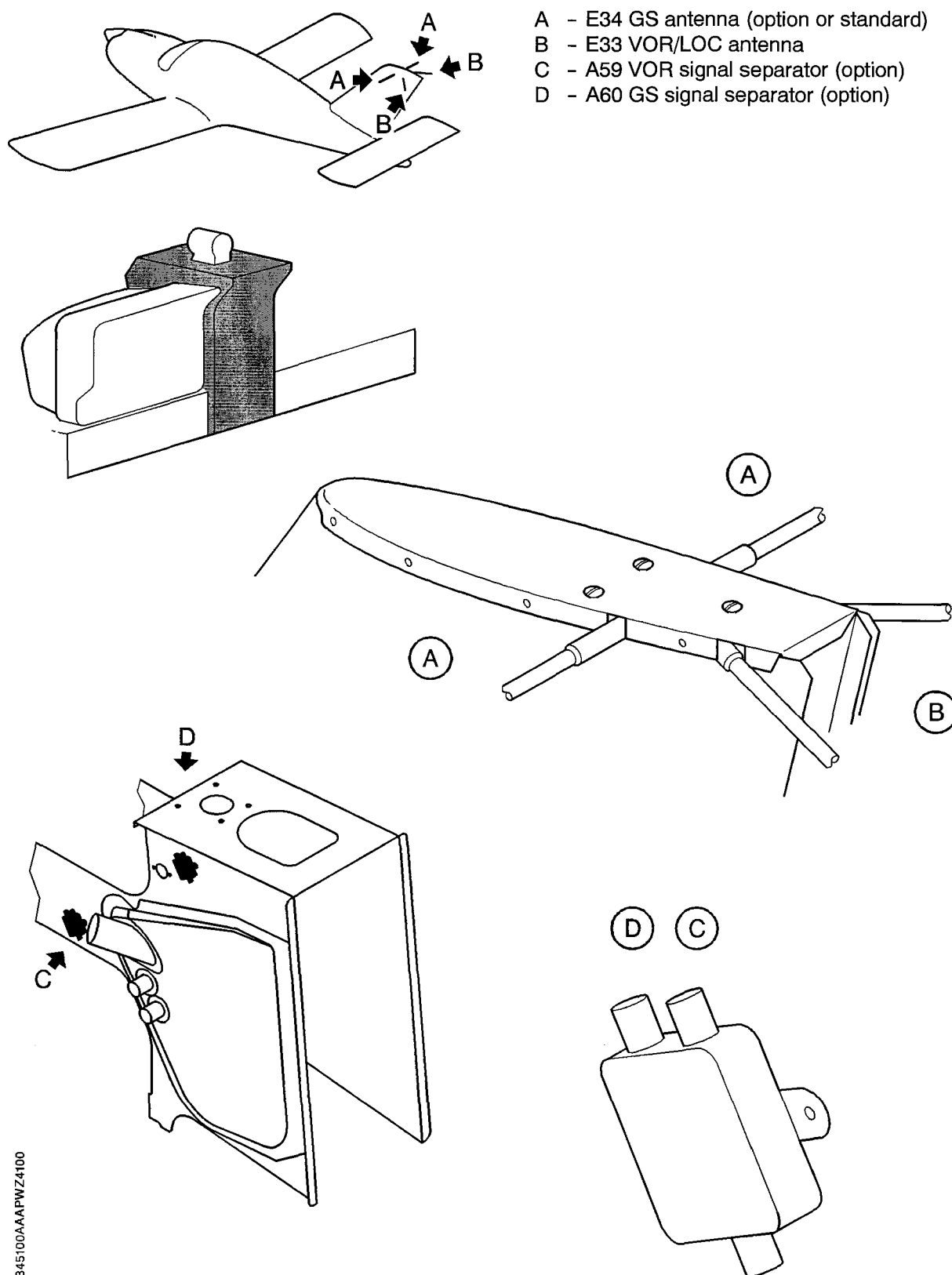
- A - A78 COMM./VOR-ILS/GPS transceiver
- B - M81 course deviation indicator

 Variante de localisation
Alternate location



NAV 1 installation – Identification and location of components
Figure 1

14231300AAAAVZ4200



NAV 1 installation – Identification and location of components
Figure 2

14345100AAAPWZ4100

B. E33 VOR/LOC antenna

The "V" type VOR/LOC antenna consists of two radiants mounted horizontally on each side of the vertical stabilizer. It is designed for the reception of signals within a frequency range from 108 MHz to 118 MHz.

C. E34 GS antenna

The GS antenna consists of two radiants mounted horizontally on each side of the vertical stabilizer. It is designed for the reception of signals within a frequency range from 329 MHz to 335 MHz.

D. A59 VOR signal separator (option)

The signal separator is used to couple NAV 1 and NAV 2 installations with the VOR/LOC antenna.

It consists of a rectangular box fitted with two attachment tabs and features 3 BNC connectors.

It is mounted on the L.H. side of the radio rack.

E. A60 GS signal separator (option)

The signal separator is used to couple NAV 1 and NAV 2 installations with the GS antenna.

It consists of a rectangular box fitted with two attachment tabs and features 3 BNC connectors.

It is mounted on the R.H. side of the radio rack.

F. M81 course deviation indicator (Figure 4)

The indicator displays VOR, ILS and GPS information provided by the A78 COMM./VOR-ILS/GPS transceiver.

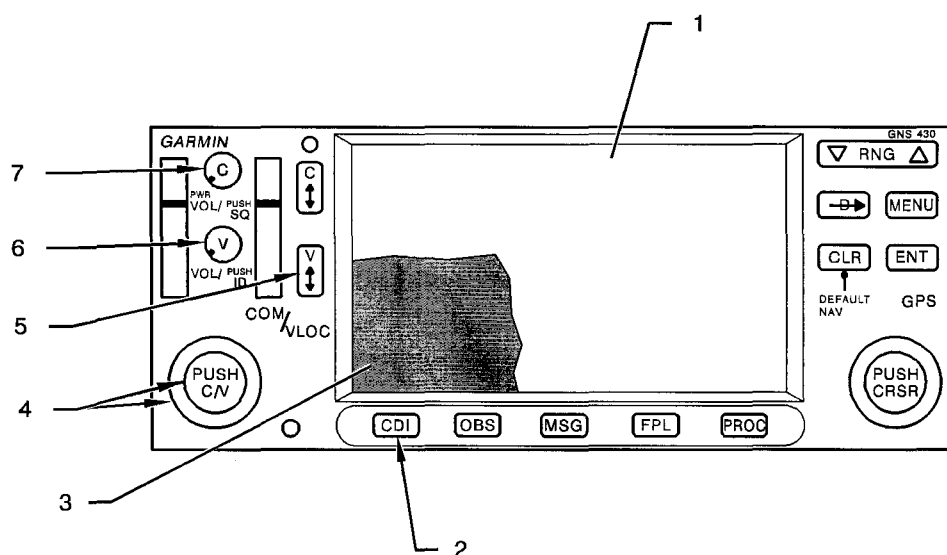
The front panel of the indicator includes :

- the "OBS" button used to adjust the desired radial under the lubber line by moving the compass card,
- the horizontal pointer showing the Glide Slope course position relative to aircraft position,
- the vertical pointer showing the VOR or GPS course deviation or LOC course position relative to aircraft position,
- the "TO/FR" flag showing "TO" if the aircraft flies towards the selected ground station or towards the selected waypoint or "FR" when the aircraft flies in the opposite direction from the ground station or from the selected waypoint.
- the VOR/LOC/GPS warning flag which appears to show that the received signals cannot be used.
- the Glide Slope warning flag which appears to show that the received signals cannot be used.
- two indicator lights to identify the origin of the information displayed by the indicator.

It is electrically supplied by "BUS 1" bar and protected by CB 87 "NAV 1/GPS 1" circuit breaker.

The indicator is mounted on the L.H. instrument panel.

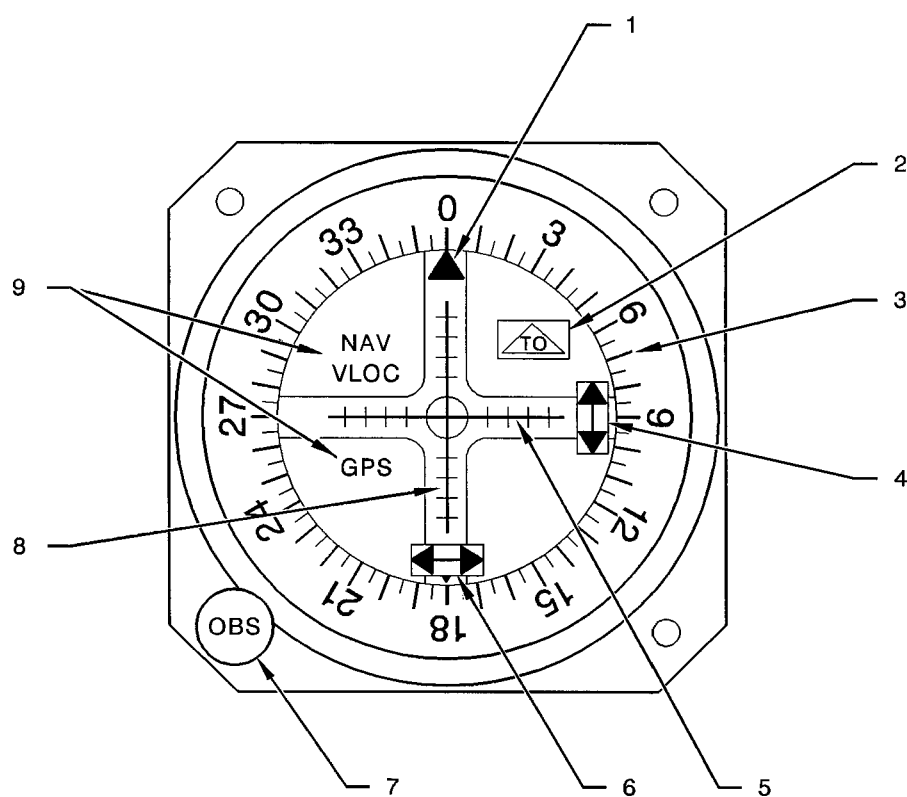
- 1 - Display
- 2 - "CDI" pushbutton
- 3 - VOR/ILS window
- 4 - Concentric knob
- 5 - "V <->" pushbutton
- 6 - ".V" button
- 7 - ".C" button



NAV 1 installation – A78 COMM./VOR-ILS/GPS transceiver
Figure 3

14231200AAA RVZ4200

- 1 - Lubber line
- 2 - "TO/FR" flag
- 3 - Compass card
- 4 - Glide slope warning flag
- 5 - Horizontal pointer
- 6 - VOR-LOC/GPS warning flag
- 7 - "OBS" button
- 8 - Vertical pointer
- 9 - Indicator lights



NAV 1 installation – M81 course deviation indicator
Figure 4

14345100AAAWVZ4000

4. OPERATION (Figure 5)

The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

The "CDI" pushbutton on the front panel of the COMM./VOR-ILS/GPS transceiver enables the selected information of VOR/ILS or GPS navigation source to be directed towards the course deviation indicator or towards the HSI. A "VLOC" or "GPS" message appears on the display above the "CDI" pushbutton to confirm the selection.

Aircraft with M81 course deviation indicator

The same message appears on the front face of the indicator.

Aircraft with M73 horizontal situation indicator (HSI)

"NAV1/GPS1" pushbutton of M6 advisory panel enables the selected information of VOR/ILS or GPS navigation source to be directed towards the horizontal situation indicator. The pushbutton indicator light relative to selection illuminates.

All

A. VOR mode

The COMM./VOR-ILS/GPS transceiver is tuned to the frequency displayed in the VOR/LOC window of the display. The VOR signal is received by the antenna and transmitted to the COMM./VOR-ILS/GPS transceiver via A59 VOR signal separator (if installed). The COMM./VOR-ILS/GPS transceiver converts the VOR signals into continuous signals to control the vertical pointer, the "TO-FR" indicator and the NAV warning flag. The transceiver processes the audio identification signal from the VOR ground station and sends it to A50 audio control panel.

B. ILS mode

When a LOC frequency is selected on the COMM./VOR-ILS/GPS transceiver, the GS receiver automatically tunes to the paired Glide Slope frequency. The LOC and GS signals are received by the VOR and GS antenna and then transmitted to the COMM./VOR-ILS/GPS transceiver via A59 VOR signal separator (if installed) and A60 GS signal separator (if installed) respectively. COMM./VOR-ILS/GPS transceiver converts the LOC and GS signals into continuous signals to actuate the vertical pointer, the horizontal pointer and the paired warning flags.

C. Coupling to the autopilot system (option)

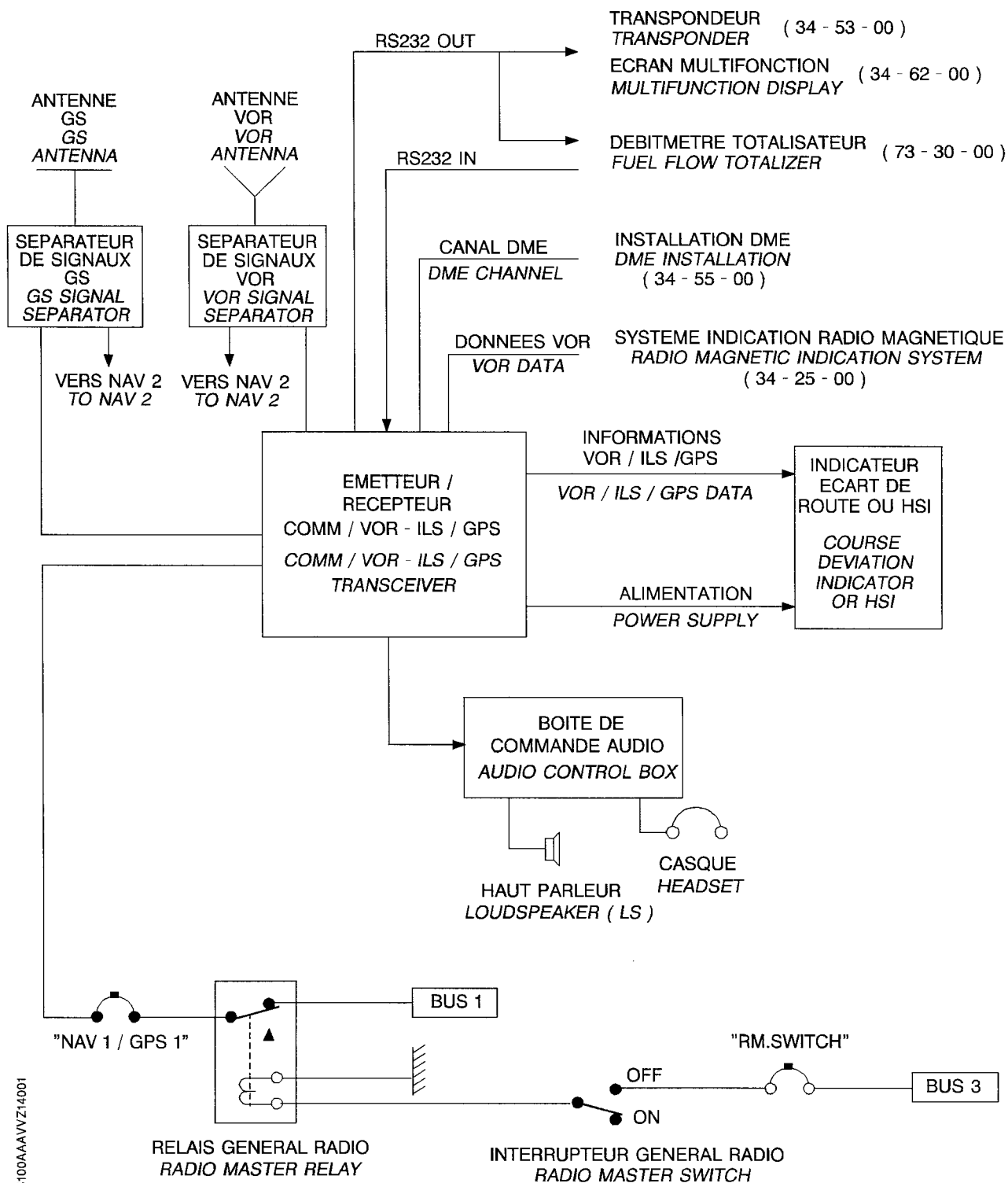
The A82 flight computer of the autopilot receives the VOR, GPS navigation data or LOC and GS approach data.

D. Coupling to the Distance Measuring Equipment (DME) (option)

The COMM./VOR-ILS/GPS transceiver sends the frequency information necessary to tune the interrogator of the Distance Measuring Equipment.

E. Coupling to the Radio Magnetic Indicator (option)

The COMM./VOR-ILS/GPS transceiver sends to the RMI the information that are necessary to display the bearing of the VOR ground station.



NAV 1 installation – Schematic
Figure 5

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NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1 and 1A)

The VOR is a short- and middle-range radio-navigation aid. It allows the pilot to locate the position of his aircraft with regard to a half-line crossing the VOR station (radial) or also to know the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional system consists of the following elements :

- a navigation receiver,
- an optional VOR signal separator,
- an optional GS signal separator,
- a VOR / LOC antenna,
- an optional GS antenna,
- a course deviation indicator (CDI).

The NAV 1 installation is connected with :

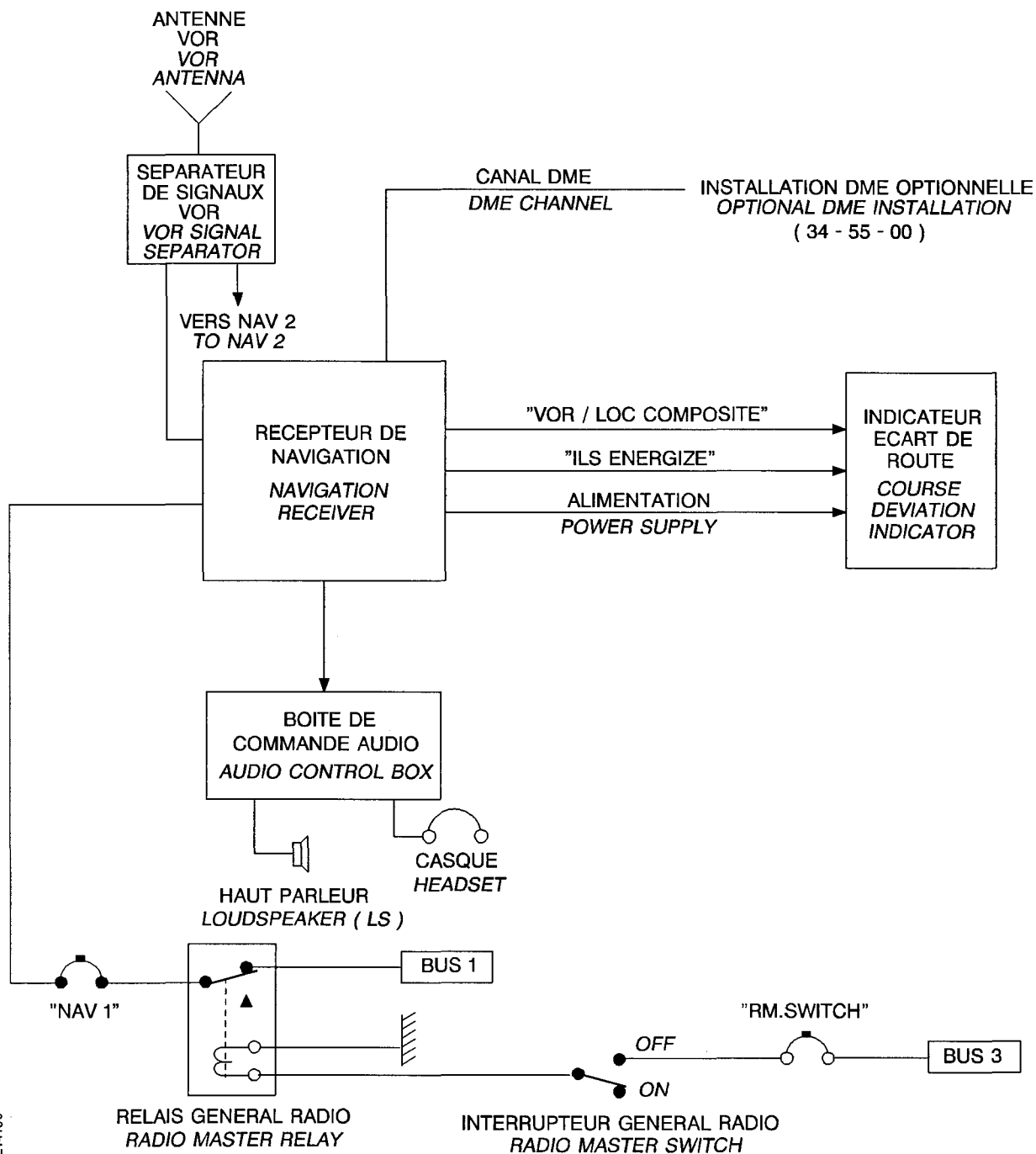
- the audio control box - refer to 23-11-00,
- the optional DME installation - refer to 34-55-00.

The navigation receiver is a 200-channel VHF VOR / LOC receiver with a 40-channel glideslope receiver / converter option.

The CDI can include an UP / DOWN glideslope needle with an associated warning flag.

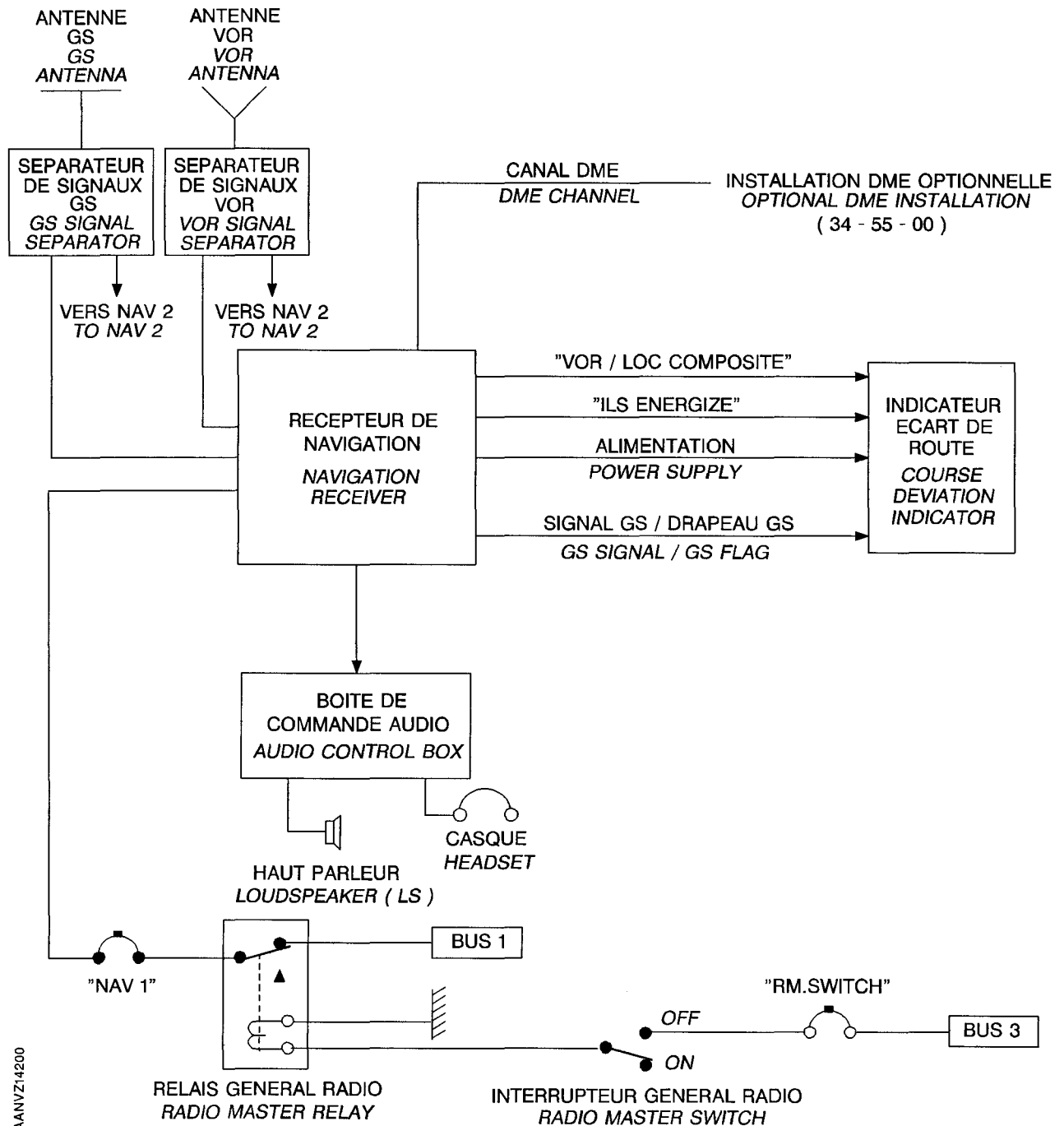
The system is electrically supplied by "BUS 1" bar via the "NAV1" circuit breaker.

NOTE : For RUSSIAN and UKRAINIAN aircraft, the system is electrically supplied by "BUS 2" bar.



14345100AAA NVZ14100

NAV 1 Installation - Electrical schematic
Figure 1 - Without glideslope



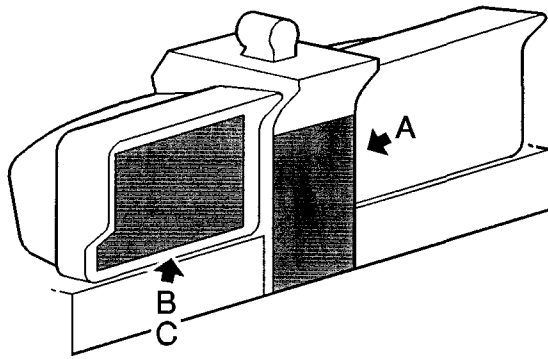
NAV 1 Installation - Electrical schematic
Figure 1A - With glideslope

2. LOCATION (Figures 2, 3 and 4)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Navigation receiver	1	251C	/	34-50-00
VOR signal separator (option)	1	251C	/	34-51-00
GS signal separator (option)	1	251C	/	34-51-00
VOR / LOC antenna	1	310	311 or 313	34-51-00
GS antenna (option)	1	310	311 or 313	34-51-00
Course deviation indicator	1	251L	/	34-51-00
Circuit breaker : - "NAV 1"	1	230	232L	WM

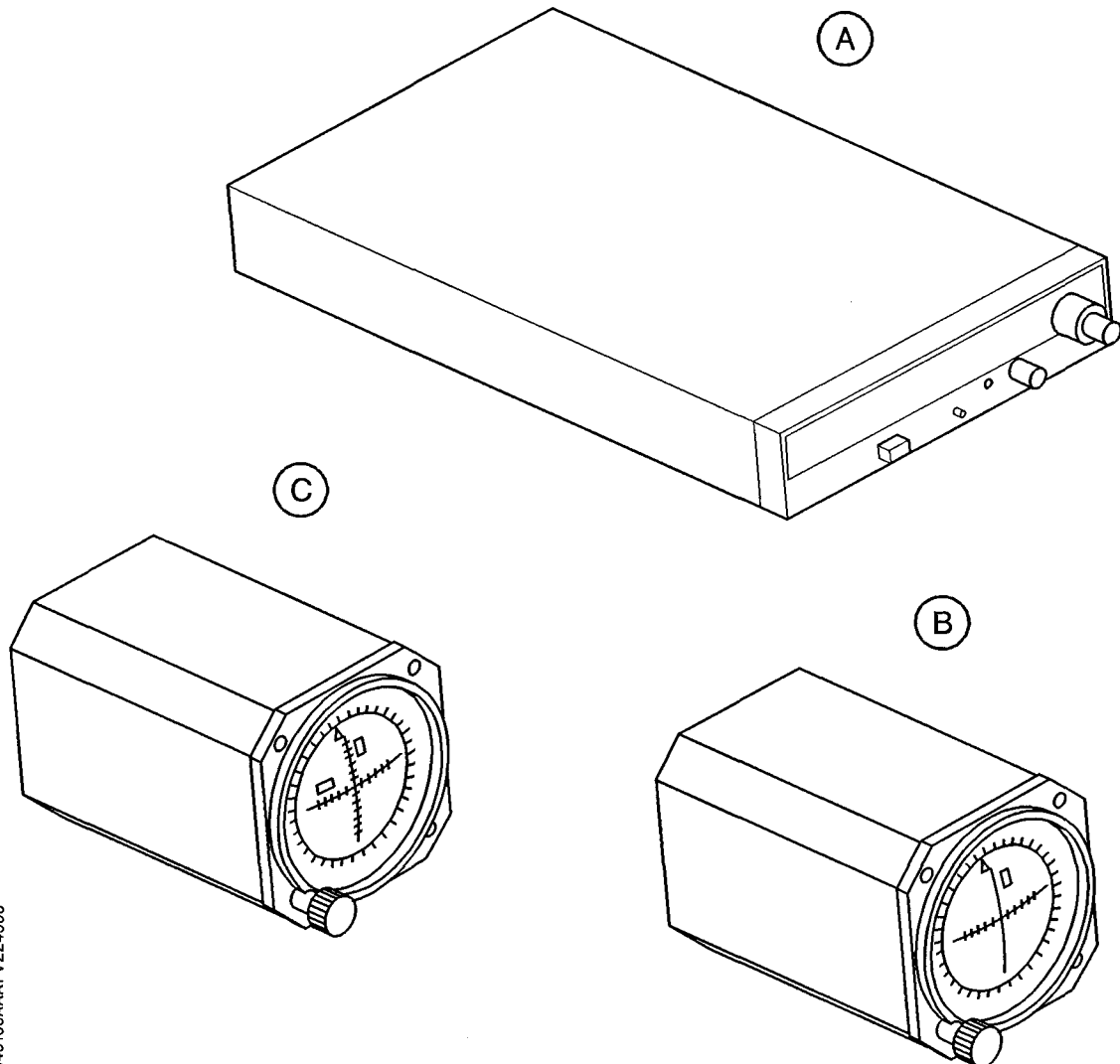
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



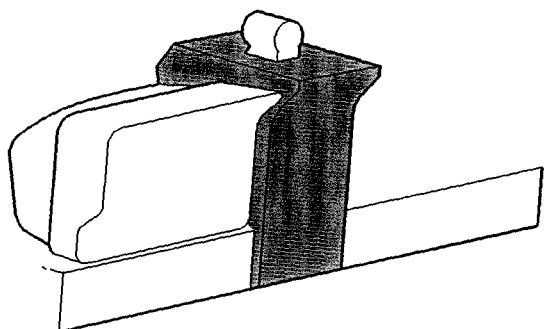
- A - Navigation receiver
- B - Course deviation indicator (VOR / LOC information)
- C - Course deviation indicator (VOR / ILS information)

 Variante de localisation
Alternate location

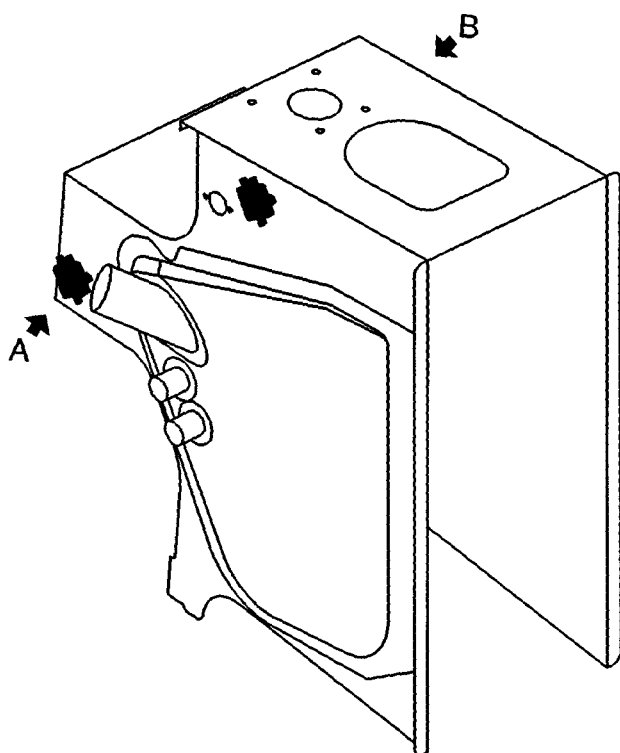


14345100AAAFVZ24000

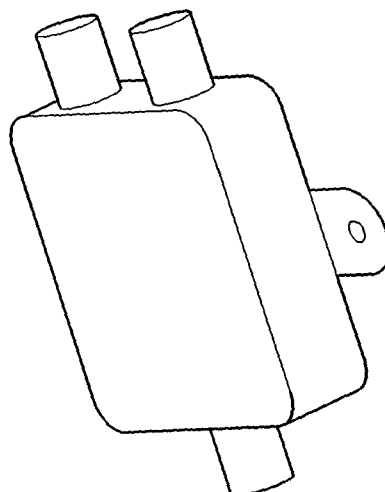
NAV 1 Installation - Identification and location of components
Figure 2



- A - VOR signal separator (option)
- B - GS signal separator (option)



(A) (B)



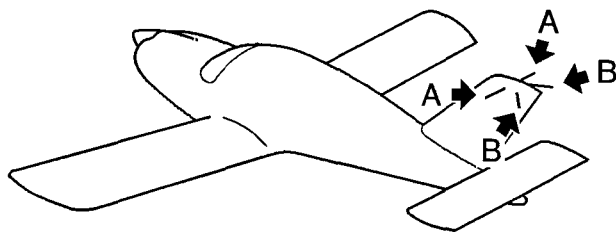
NAV 1 Installation - Identification and location of components
Figure 3

14345100AAAPWZ4000

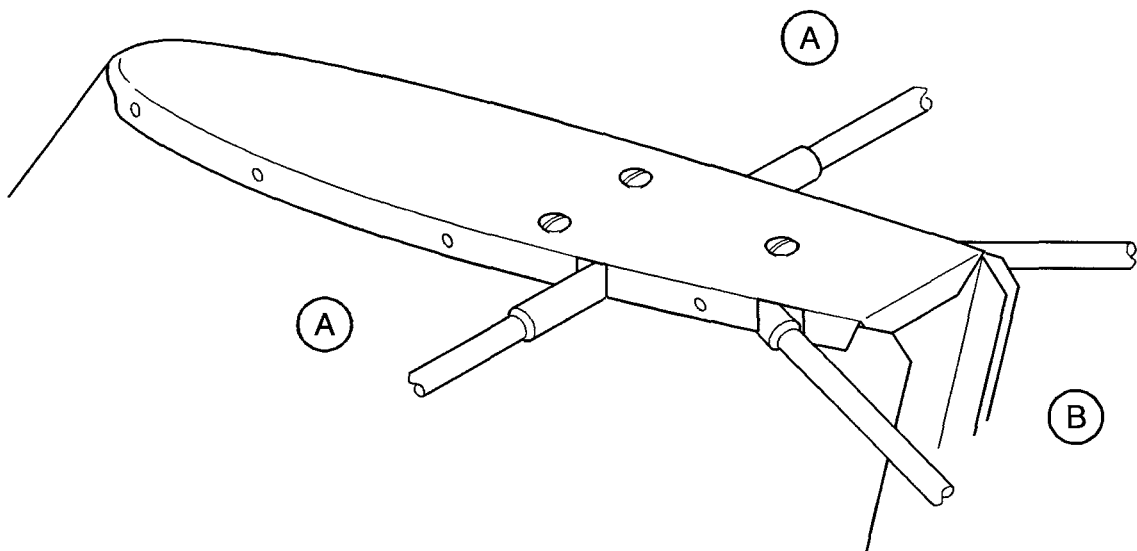
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34-51-00 (DM)

Page 6
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A - GS antenna (option)
B - VOR / LOC antenna



I4345100AAAQWZ4000

NAV 1 Installation - Identification and location of components
Figure 4

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NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

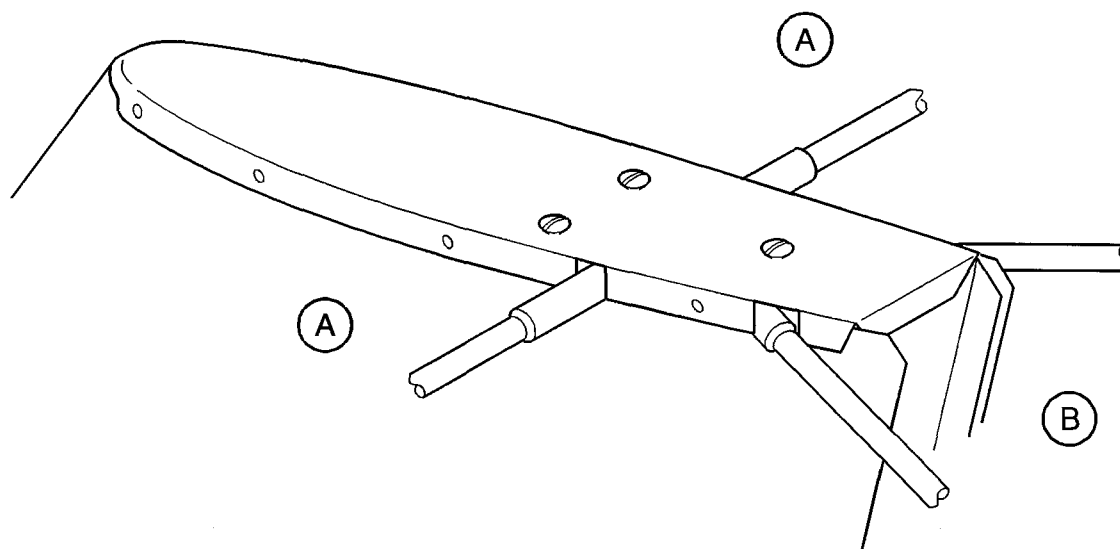
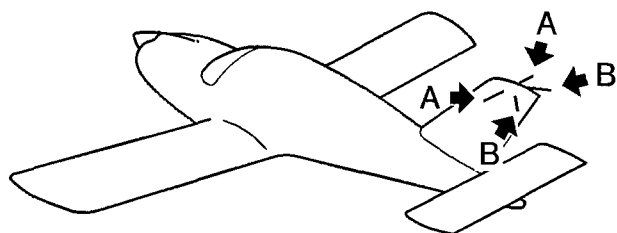
1. GENERAL

Standard NAV 1 installation consists of the VOR/LOC antenna and its coaxial cable, and of the GS antenna and its paired coaxial cable.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
E33 VOR/LOC antenna	1	310	311 or 313	/
E34 GS antenna	1	310	311 or 313	/

- A - E34 GS antenna
- B - E33 VOR / LOC antenna



NAV 1 installation – Identification and location of components
Figure 1

I4345100AAQWZ4000

NAV 1 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL

The VOR is a short- and middle-range navigation aid. It enables the pilot to locate the position of his aircraft with regard to a half-line (radial) crossing the VOR station or also to determine the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional NAV 1 installation consists of :

- the A78 COMM./VOR-ILS/GPS transceiver,
- the E33 VOR/LOC antenna,
- the E34 GS (GLIDE) antenna,
- the A59 VOR signal separator (option),
- the A60 GS signal separator (option).

The installation uses M73 horizontal situation indicator (HSI) which is a component of the heading system – refer to 34-21-00.

The installation uses the M6 advisory panel – refer to 31-50-00.

With relation to the options installed on the aircraft, NAV 1 installation receives and/or sends signals to :

- the A50 audio control panel – refer to 23-11-00,
- the Distance Measuring Equipment (DME) – refer to 34-55-00,
- the Radio Magnetic Indicator (RMI) – refer to 34-25-00,
- the stormscope system – refer to 34-41-00,
- the transponder (GTX 327) – refer to 34-53-00,
- the multifunction display – refer to 34-62-00,
- the fuel flow totalizer – refer to 73-30-00,
- the autopilot system – refer to 22-12-00.

For the description of the communication function of the A78 COMM./VOR-ILS/GPS transceiver, refer to 23-12-00.

For the description of the GPS function of the A78 COMM./VOR-ILS/GPS transceiver, refer to 37-57-00.

Without "Ground Clearance"

The installation is electrically supplied by "BUS 1" bar.

With "Ground Clearance"

The installation is electrically supplied by "BUS 1" bar or by the battery.

2. LOCATION (Figures 1 and 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 COMM./VOR-ILS/GPS transceiver	1	PL30	/	34-50-00
E33 VOR/LOC antenna	1	310	311 or 313	34-51-00
E34 GS antenna	1	310	311 or 313	34-51-00
A59 VOR signal separator (option)	1	251C	/	34-51-00
A60 GS signal separator (option)	1	251C	/	34-51-00
Circuit breaker :				
- CB 87 "NAV GPS1"	1	PL1	/	WM
- CB 17 (if installed)	1	210	218A	WM

3. DESCRIPTION

A. A78 COMM./VOR-ILS/GPS transceiver (Figure 3)

The A78 COMM./VOR-ILS/GPS transceiver is designed for the reception of navigation and guidance signals within a frequency range from 108.00 to 117.95 MHz and reception of GS signals within a frequency range from 329.15 to 335.00 MHz. It provides M73 horizontal situation indicator (HSI) with NAV/ILS information.

The A78 COMM./VOR-ILS/GPS transceiver is a rectangular box installed in an attachment rack. Connections are made through four electrical connectors and four antenna connectors on the back panel.

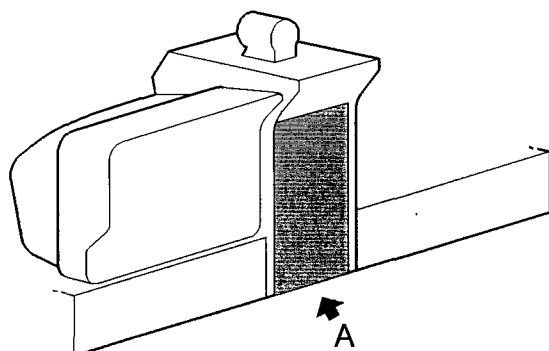
For the VOR/ILS functions, the front panel includes :

- the display (1) subdivided in three windows. The window (4) relative to VOR/ILS functions is located in the middle L.H. portion of the display. The active frequency and below it, the standby frequency are displayed in this window.
- the ".C" button (7) used to energize the equipment,
- the ".V" button (5) used to adjust the audio level and select the identification code of the ground station,
- the "V<->" pushbutton (6) used to enable the frequency displayed in the active frequency window to flip-flop with the frequency displayed in the "STBY" window and vice-versa,
- two concentric knobs (3) used to modify standby frequency when the cursor function is enabled. If necessary, press momentarily the inner concentric knob to activate cursor function,
- the "CDI" pushbutton (2) used to direct the selected VOR/ILS or GPS information source towards M73 HSI.

Without "Ground Clearance"

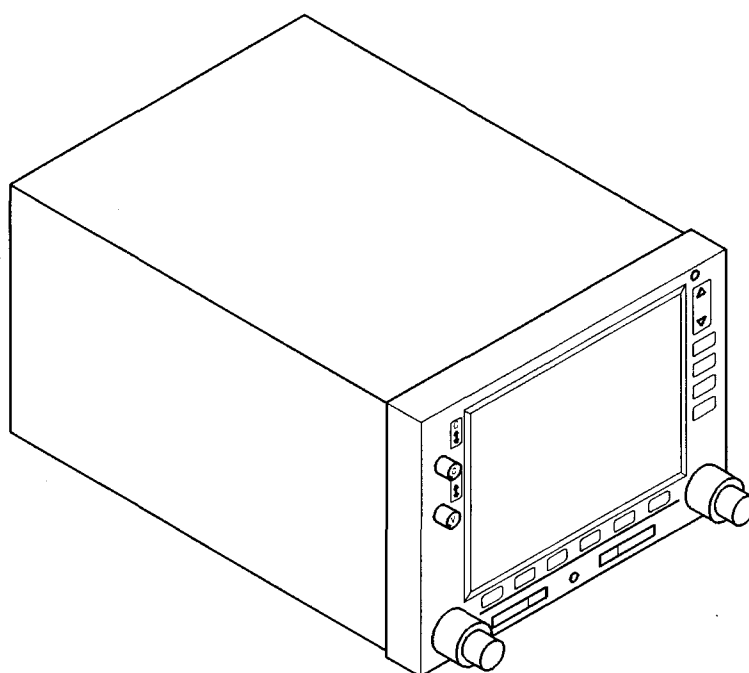
The COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar and protected by CB 87 "NAV GPS1" circuit breaker.

A - A78 COMM./VOR-ILS/GPS transceiver



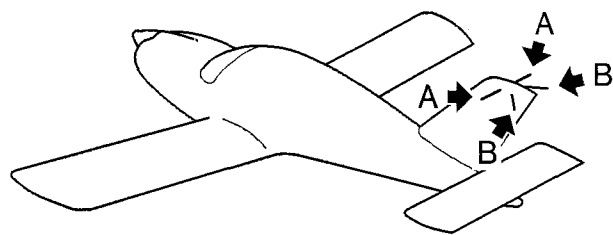
 Variante de localisation
Alternate location

A

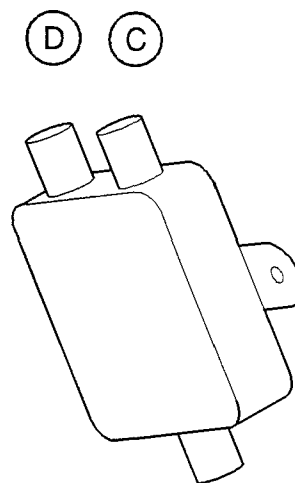
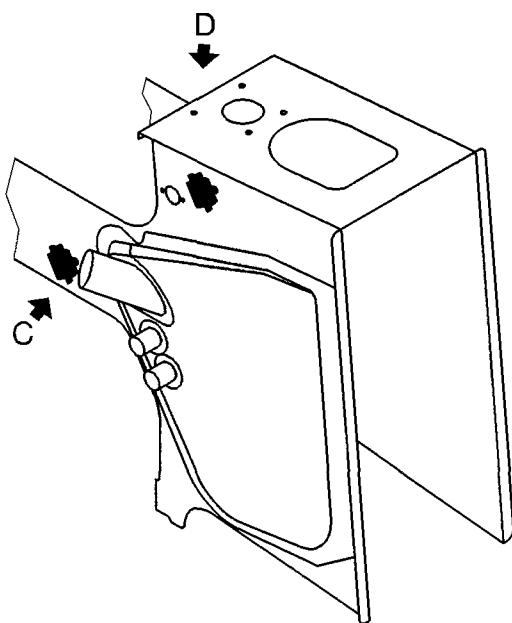
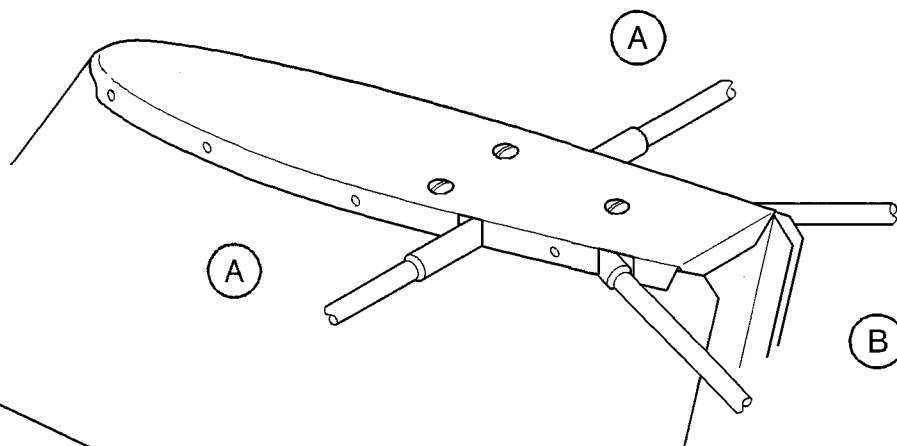
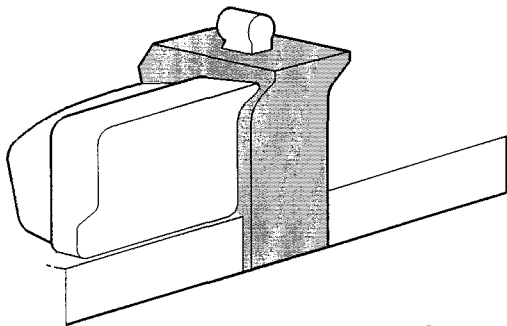


I4345700AADA VZ4000

NAV 1 installation – Identification and location of components
Figure 1



- A - E34 GS antenna
- B - E33 VOR/LOC antenna
- C - A59 VOR signal separator (option)
- D - A60 GS signal separator (option)



NAV 1 installation – Identification and location of components
Figure 2

14345100AAAPWZ4100

With "Ground Clearance"

In normal operation, the COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar via a main radio relay and via K201-relay contacts in idle position. It is protected by CB 87 "NAV GPS1" circuit breaker.

When "Ground Clearance" function is enabled, the battery electrically supplies COMM./VOR-ILS/GPS transceiver directly, via K201-relay contacts in work position. CB 17 circuit breaker thus protects the feed line. The circuit breaker is secured to frame No. 4 near the starter relay.

All

The COMM./VOR-ILS/GPS transceiver is mounted on PL30 radio rack.

B. E33 VOR/LOC antenna

The "V" type VOR/LOC antenna consists of two radiants mounted horizontally on each side of the vertical stabilizer. It is designed for the reception of signals within a frequency range from 108 MHz to 118 MHz.

C. E34 GS antenna

The GS antenna consists of two radiants mounted horizontally on each side of the vertical stabilizer. It is designed for the reception of signals within a frequency range from 329 MHz to 335 MHz.

D. A59 VOR signal separator (option)

The signal separator is used to couple NAV 1 and NAV 2 installations with the VOR/LOC antenna.

It consists of a rectangular box fitted with two attachment tabs and features 3 BNC connectors.

It is mounted on the L.H. side of the radio rack.

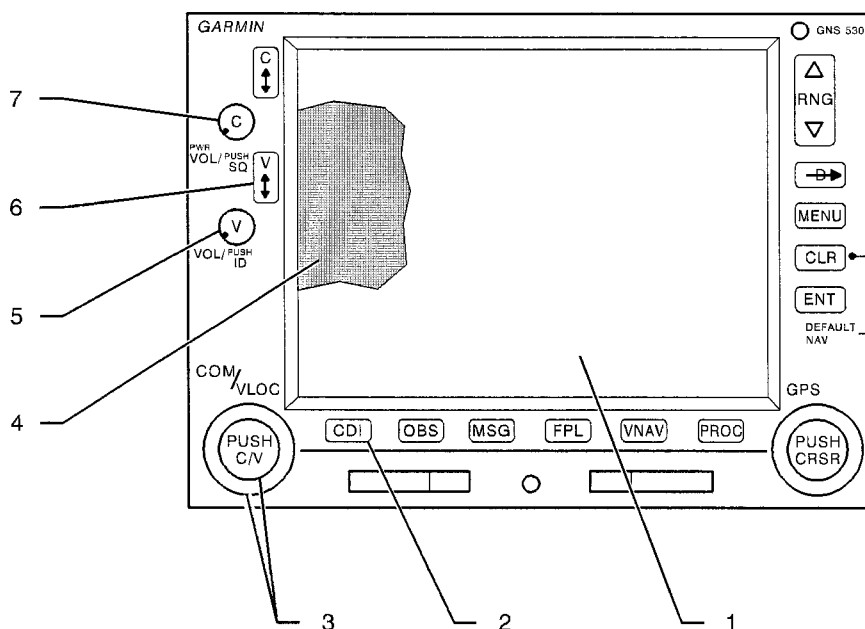
E. A60 GS signal separator (option)

The signal separator is used to couple NAV 1 and NAV 2 installations with the GS antenna.

It consists of a rectangular box fitted with two attachment tabs and features 3 BNC connectors.

It is mounted on the R.H. side of the radio rack.

- 1 - Display
- 2 - "CDI" pushbutton
- 3 - Concentric knobs
- 4 - Window
- 5 - ".V" button
- 6 - "V <->" pushbutton
- 7 - ".C" button



NAV 1 installation – A78 COMM./VOR-ILS/GPS transceiver
Figure 3

4. OPERATION (Figures 4 and 4A)

The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

The "CDI" pushbutton on the front panel of the COMM./VOR-ILS/GPS transceiver enables the selected information of VOR/ILS or GPS navigation source to be directed towards the horizontal situation indicator (HSI). A "VLOC" or "GPS" message appears on the display above the "CDI" pushbutton to confirm the selection.

"NAV GPS1" pushbutton of advisory panel also enables the selected information of VOR/ILS or GPS navigation source to be directed towards the horizontal situation indicator. The pushbutton indicator light relative to the selection illuminates.

A. VOR mode

The COMM./VOR-ILS/GPS transceiver is tuned to the frequency displayed in the VOR/LOC window of the display. The VOR signal is received by the antenna and transmitted to the COMM./VOR-ILS/GPS transceiver via A59 VOR signal separator (if installed). The COMM./VOR-ILS/GPS transceiver converts the VOR signals into DC signals to control the vertical pointer, the "TO-FR" indicator and the NAV warning flag. The transceiver processes the audio identification signal from the VOR ground station and sends it to A50 audio control panel.

B. ILS mode

When a LOC frequency is selected on the COMM./VOR-ILS/GPS transceiver, the GS receiver automatically tunes to the paired Glide Slope frequency. The LOC and GS signals are received by the VOR and GS antenna and then transmitted to the COMM./VOR-ILS/GPS transceiver via A59 VOR signal separator (if installed) and A60 GS signal separator (if installed) respectively. COMM./VOR-ILS/GPS transceiver converts the LOC and GS signals into DC signals to actuate the vertical pointer, the horizontal pointer and the paired warning flags.

C. Coupling to the autopilot system (option)

The A82 flight computer of the autopilot receives the VOR, GPS navigation data or LOC and GS approach data.

D. Coupling to the Distance Measuring Equipment (DME) (option)

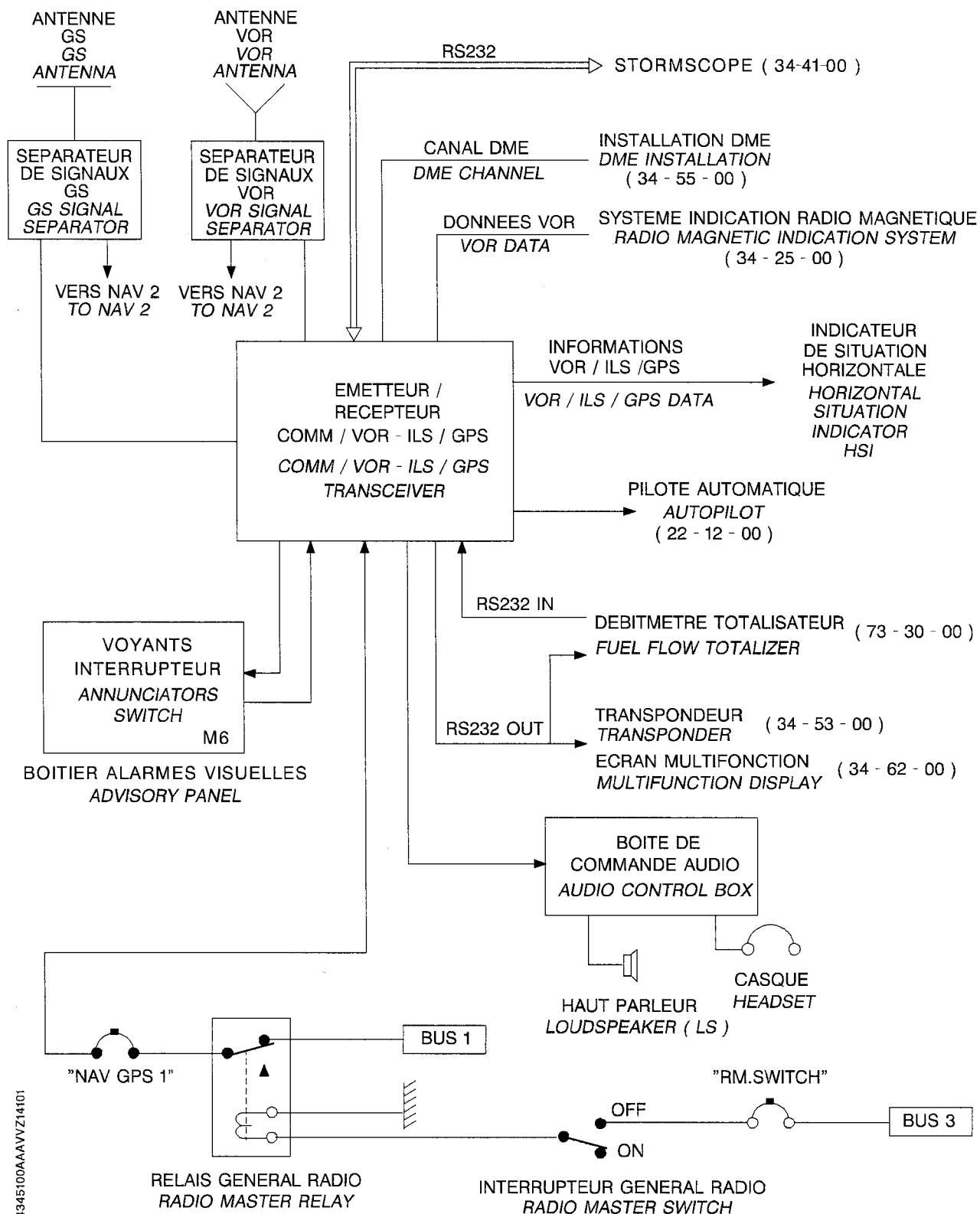
The COMM./VOR-ILS/GPS transceiver sends the frequency information necessary to tune the interrogator of the Distance Measuring Equipment.

E. Coupling to the Radio Magnetic Indicator (option)

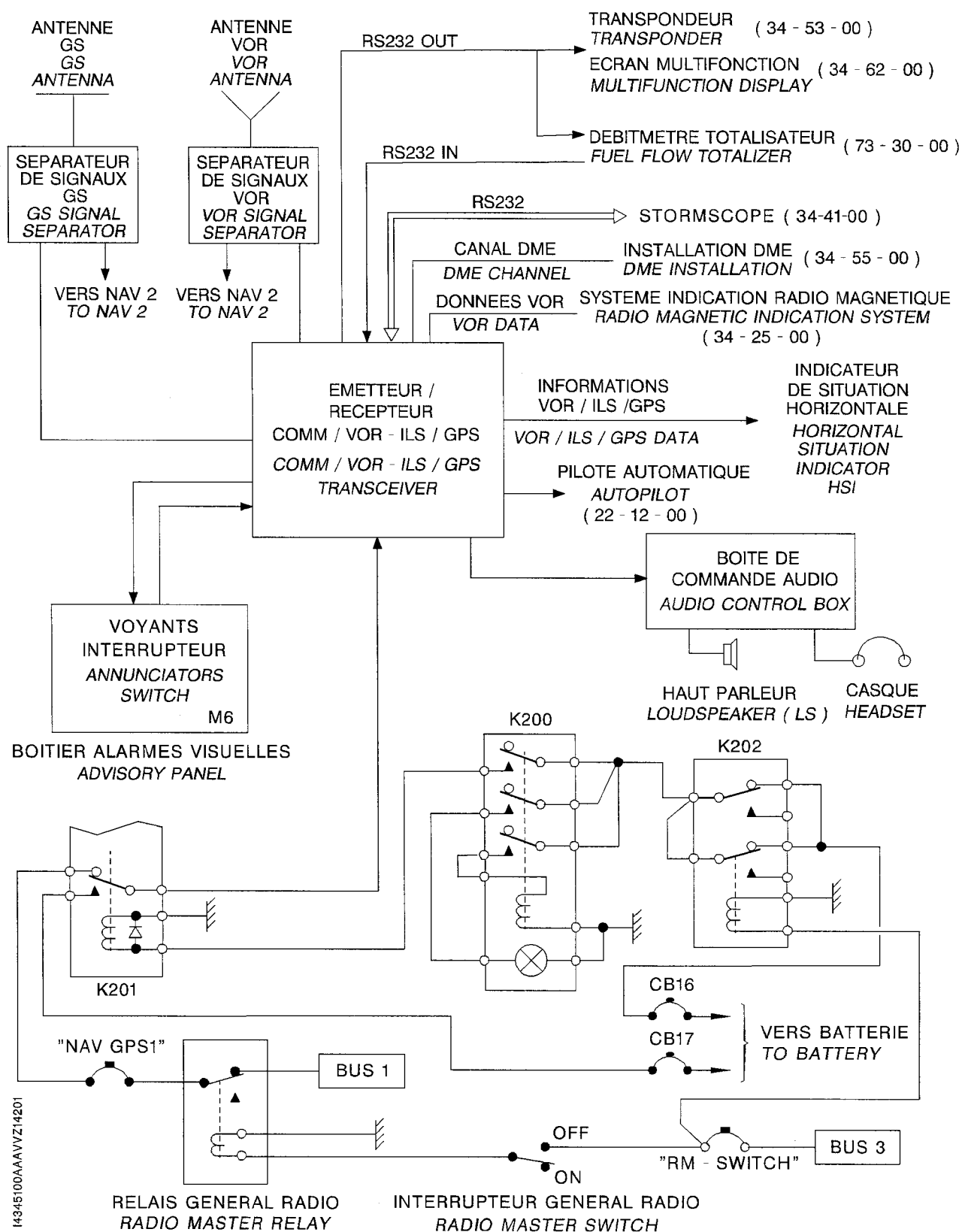
The COMM./VOR-ILS/GPS transceiver sends to the RMI the information that are necessary to display the bearing of the VOR ground station.

F. Coupling to the WX500-series stormscope system (option)

COMM./VOR-ILS/GPS transceiver provides a display for the detection system of electrical thunderstorm-related discharges. The processor of stormscope system determines the sources and ranges of electrical discharges and elaborates the data necessary for presentation on the display. The processor forwards these data to COMM./VOR-ILS/GPS transceiver via a RS232 link. Selection of MAP page in NAV group enables the pilot to present the data on display.



NAV 1 installation – Schematic
Figure 4 - Without "Ground Clearance"



NAV 1 installation - Schematic
Figure 4A - With "Ground Clearance"

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NAV 2 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1 and 1A)

The VOR is a short- and middle-range navigation aid. It enables the pilot to locate the position of his aircraft with regard to a half line (radial) crossing the VOR station or also to determine the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional system consists of :

- a VHF NAV / COMM transceiver,
- a course deviation indicator.

The system uses the VOR / LOC antenna, the GS antenna, the VOR and GS (option) signal separators. All these elements are known at the NAV 1 installation - refer to 34-51-00.

The system is connected with :

- the optional DME installation - refer to 34-55-00,
- the audio control box - refer to 23-11-00.

The VHF NAV / COMM transceiver combines, in a single unit, a VHF COM transceiver and a 200-channel VHF VOR / LOC receiver with a 40-channel glideslope receiver / converter option.

The CDI can include an UP / DOWN glideslope needle with an associated warning flag.

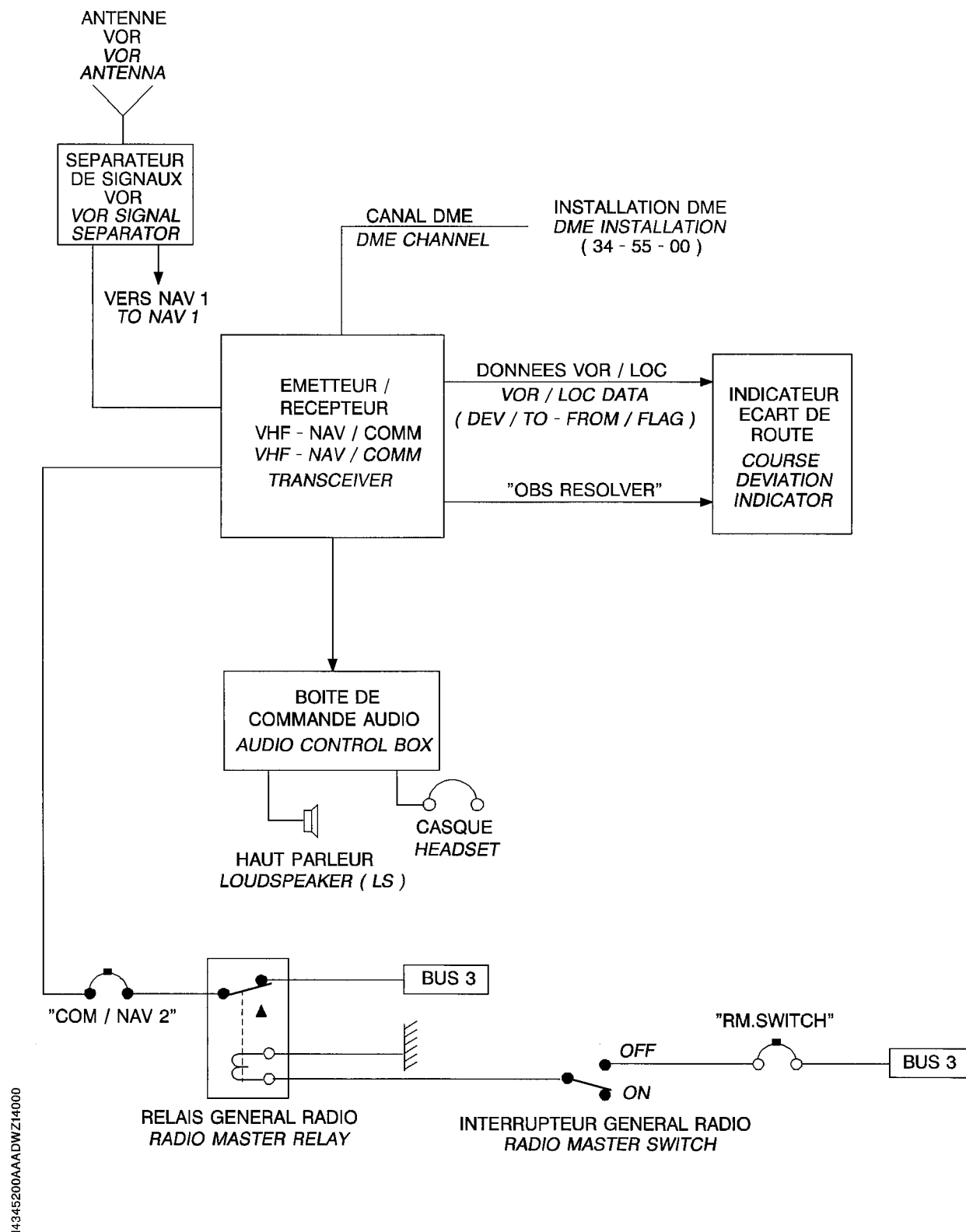
The system is electrically supplied by "BUS 3" bar via the "COM / NAV 2" circuit breaker.

2. LOCATION (Figure 2)

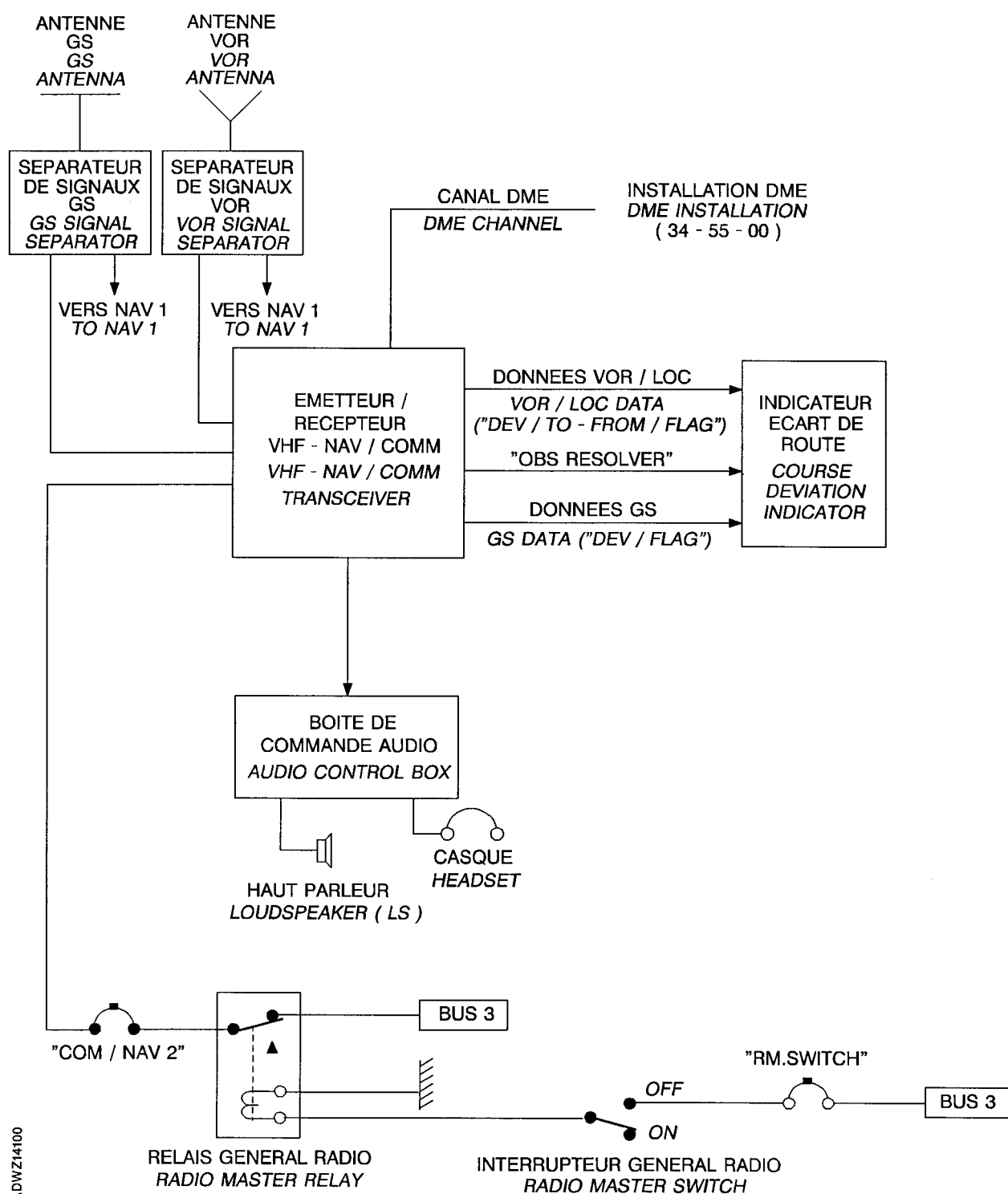
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
VHF NAV / COMM transceiver	1	251C	/	34-50-00
Course deviation indicator	1	251R or 251L	/	34-52-00
Circuit breaker : - "COM / NAV 2"	1	230	232L	WM

3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

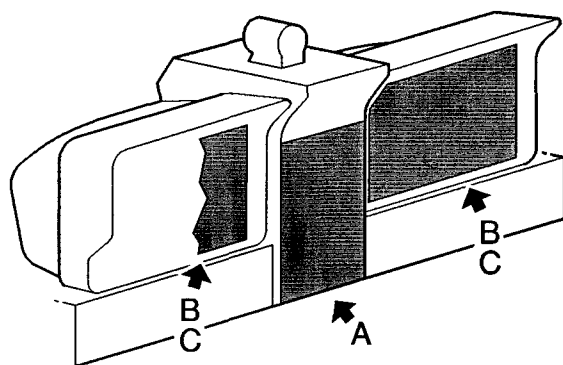


NAV 2 installation - Electrical schematic
Figure 1 - Without glideslope



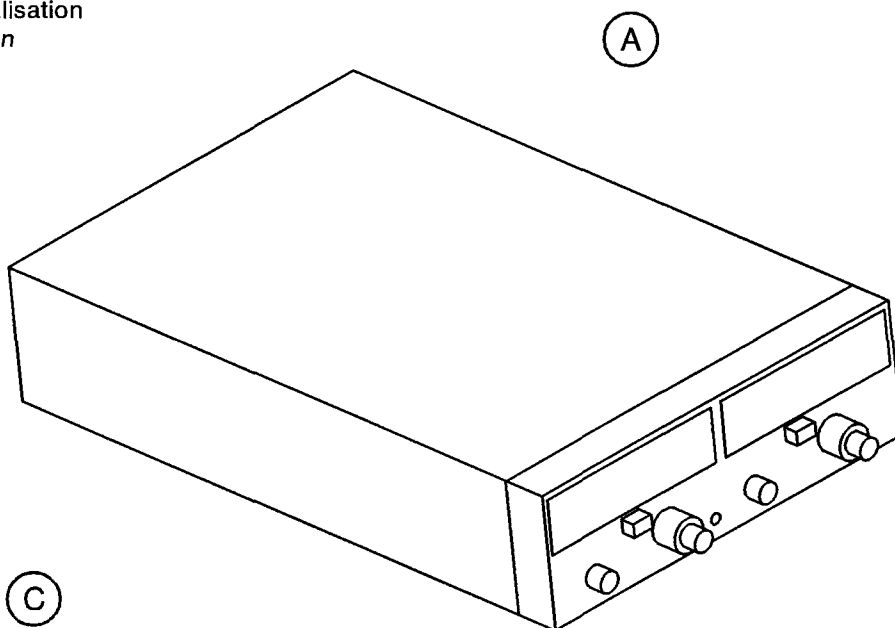
I4345200AAADWZ14100

NAV 2 installation - Electrical schematic
Figure 1A - With glideslope

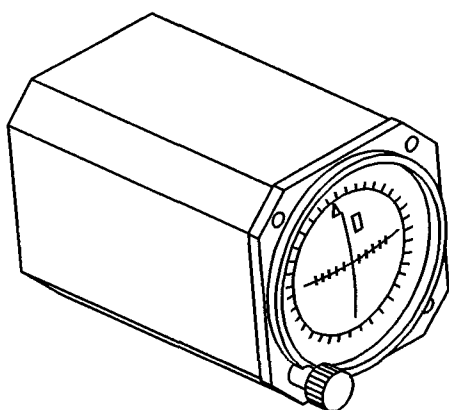


- A - VHF NAV / COMM transceiver
- B - Course deviation indicator (VOR / ILS information)
- C - Course deviation indicator (VOR / LOC information)

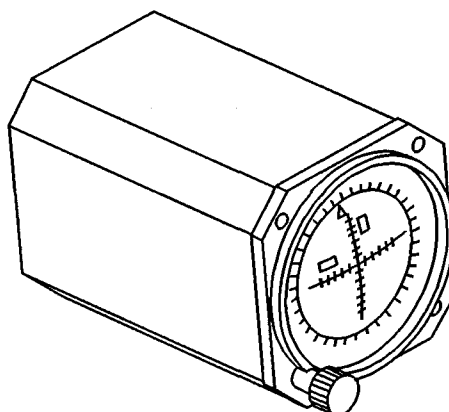
 Variante de localisation
Alternate location



(C)



(B)



NAV 2 installation - Identification and location of components
Figure 2

NAV 2 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL

The VOR is a short- and middle-range navigation aid. It enables the pilot to locate the position of his aircraft with regard to a half-line (radial) crossing the VOR station or also to determine the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional NAV 2 installation consists of :

- the A77 COMM./VOR-ILS/GPS transceiver GNS 430
- the M74 course deviation indicator GI 106A

The system uses the VOR/LOC antenna, the GS antenna and the VOR and GS signal separators. All these elements can be found in NAV 1 installation – refer to 34-51-00.

The NAV 2 installation transmits navigation information to radio magnetic indication system (Option RMI - KNI 582) – refer to 34-25-00.

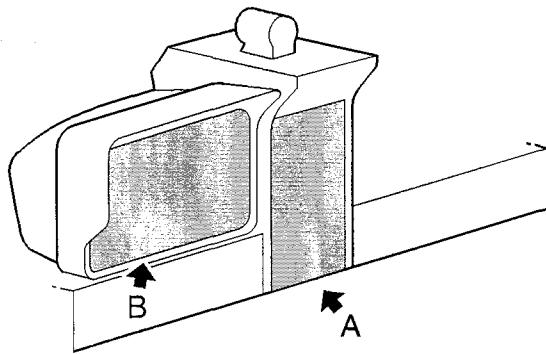
For the description of communication function of the A77 COMM./VOR-ILS/GPS transceiver – refer to 23-13-00.

For the description of GPS function of the A77 COMM./VOR-ILS/GPS transceiver – refer to 37-57-00.

The installation is electrically supplied by "BUS 3" bar.

2. LOCATION (Figure 1)

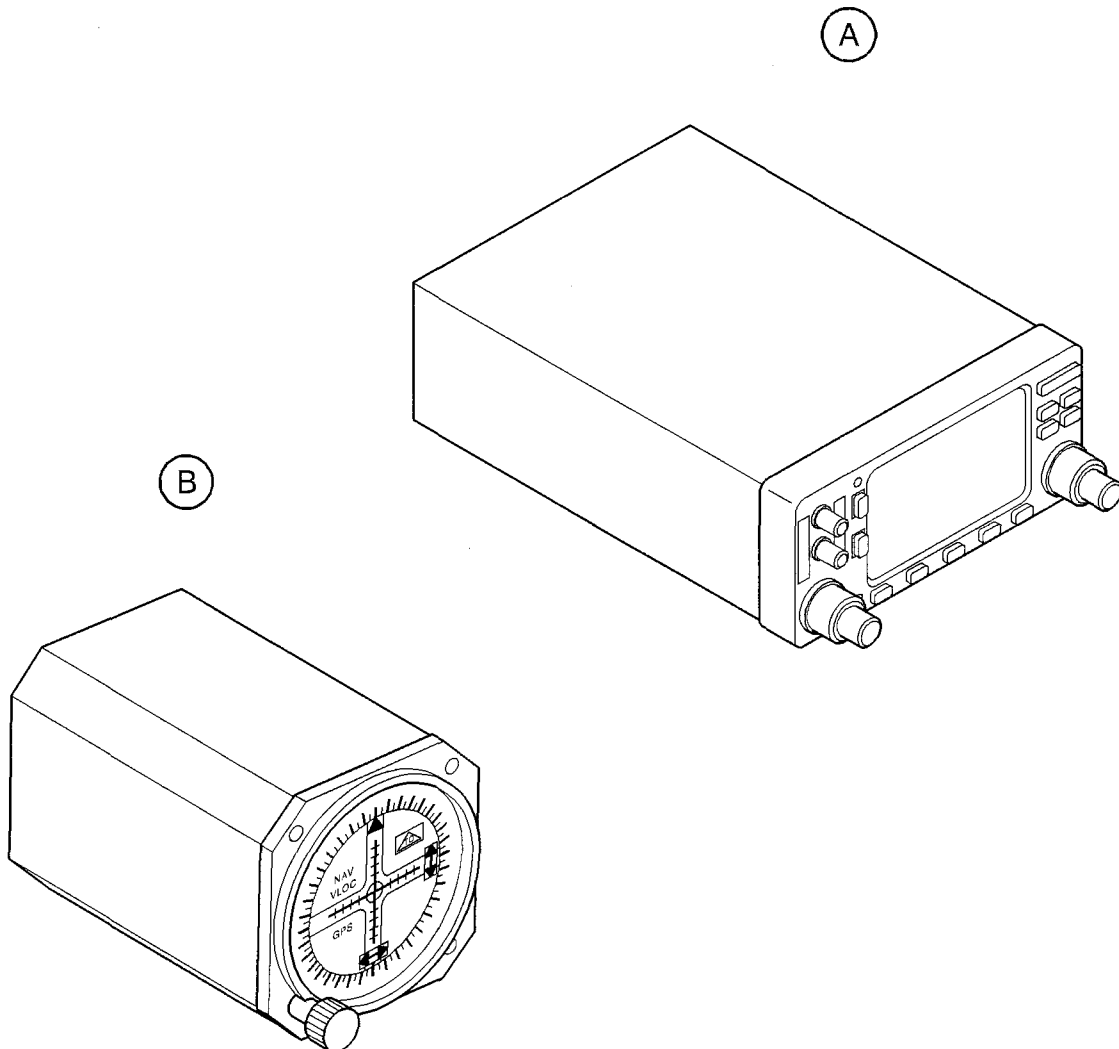
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A77 COMM./VOR-ILS/GPS transceiver	1	PL30	/	34-50-00
M74 course deviation indicator	1	251L	/	34-52-00
Circuit breaker : - CB 194 "NAV GPS 2"	1	PL1	/	WM



- A - A77 COMM./VOR-ILS/GPS transceiver
- B - M74 course deviation indicator



Variante de localisation
Alternate location



NAV 2 installation – Identification and location of components
Figure 1

14231300AAA/VZ4200

3. DESCRIPTION

A. A77 COMM./VOR-ILS/GPS transceiver (Figure 2)

The A77 COMM./VOR-ILS/GPS transceiver is designed for the reception of navigation and guidance signals within a frequency range from 108.00 to 117.95 MHz and reception of GS signals within a frequency range from 329.15 to 335.00 MHz. It provides M74 course deviation indicator with NAV/ILS information.

The COMM./VOR-ILS/GPS transceiver is a rectangular box installed in an attachment rack. Connections are made through three electrical connectors and four antenna connectors located on the back panel.

For the VOR/ILS functions, the front panel includes :

- the display (1) subdivided in three windows. The window (3) relative to VOR/ILS functions is located in the lower left part of the display. The active frequency and below it, the standby frequency are displayed in this window.
- the ".C" button (7) used to energize the equipment,
- the ".V" button (6) used to adjust the audio level and selects the identification code of the ground station,
- the "V<->" pushbutton (5) used to enable the frequency displayed in the active frequency window to flip-flop with the frequency displayed in the "STBY" window and vice-versa.
- two concentric knobs (4) used to modify standby frequency when the cursor function is enabled. If necessary, press momentarily the inner concentric knob to activate cursor function.
- the "CDI" pushbutton (2) used to direct the selected VOR/ILS or GPS information source towards M74 course deviation indicator.

The COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 3" and protected by CB 194 "NAV GPS 2" circuit breaker.

The COMM./VOR-ILS/GPS transceiver is mounted on PL30 radio rack.

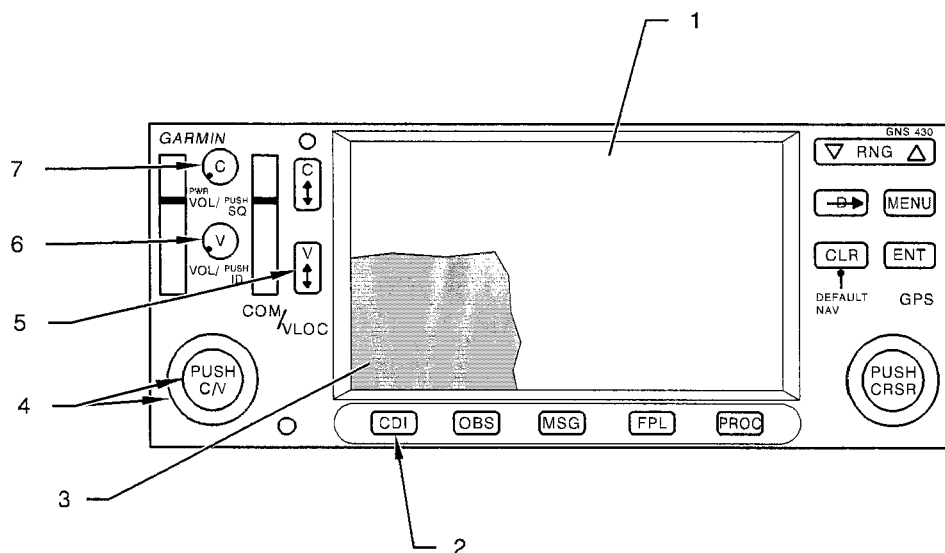
B. M74 course deviation indicator (Figure 3)

M74 course deviation indicator displays VOR, ILS and GPS information provided by the A77 COMM./VOR-ILS/GPS transceiver.

The front panel of M74 course deviation indicator includes :

- the "OBS" button used to adjust the desired radial under the lubber line by moving the compass card,
- the horizontal pointer showing the Glide Slope course position relative to aircraft position,
- the vertical pointer showing the VOR or GPS course deviation or LOC course position relative to aircraft position,
- the "TO/FR" flag showing "TO" if the aircraft flies towards the selected ground station or towards the selected waypoint or "FR" when the aircraft flies in the opposite direction from the ground station or from the selected waypoint.

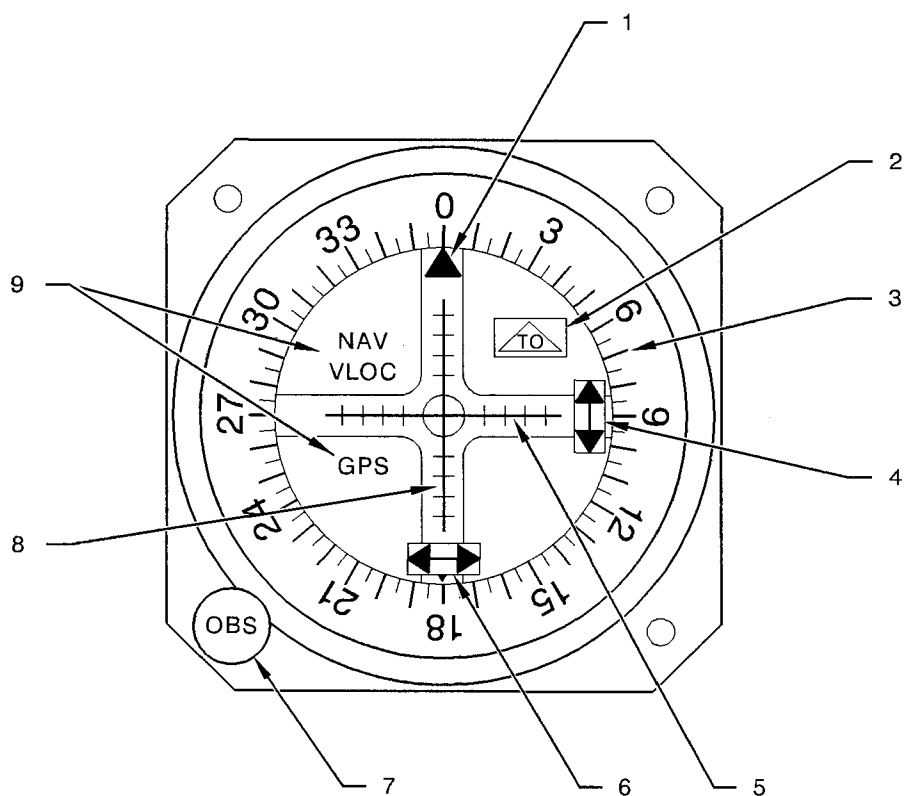
- 1 - Display
- 2 - "CDI" pushbutton
- 3 - Window
- 4 - Concentric knobs
- 5 - "V<->" pushbutton
- 6 - ".V" button
- 7 - ".C" button



NAV 2 installation – A77 COMM./VOR-ILS/GPS transceiver
Figure 2

14231200AAARVZ4200

- 1 - Lubber line
- 2 - "TO/FR" flag
- 3 - Compass card
- 4 - Glide Slope warning flag
- 5 - Horizontal pointer
- 6 - VOR-LOC/GPS warning flag
- 7 - "OBS" button
- 8 - Vertical pointer
- 9 - Indicator lights



NAV 2 installation – M74 course deviation indicator
Figure 3

14345100AAAWVZ4000

- the VOR/LOC/GPS warning flag which appears to show that the received signals cannot be used.
- the Glide Slope warning flag which appears to show that the received signals cannot be used.
- two indicator lights to identify the origin of information displayed by the indicator.

It is electrically supplied by "BUS 3" bar and protected by CB 194 "NAV GPS 2" circuit breaker.

The indicator is mounted on the L.H. instrument panel.

4. OPERATION (Figure 4)

The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

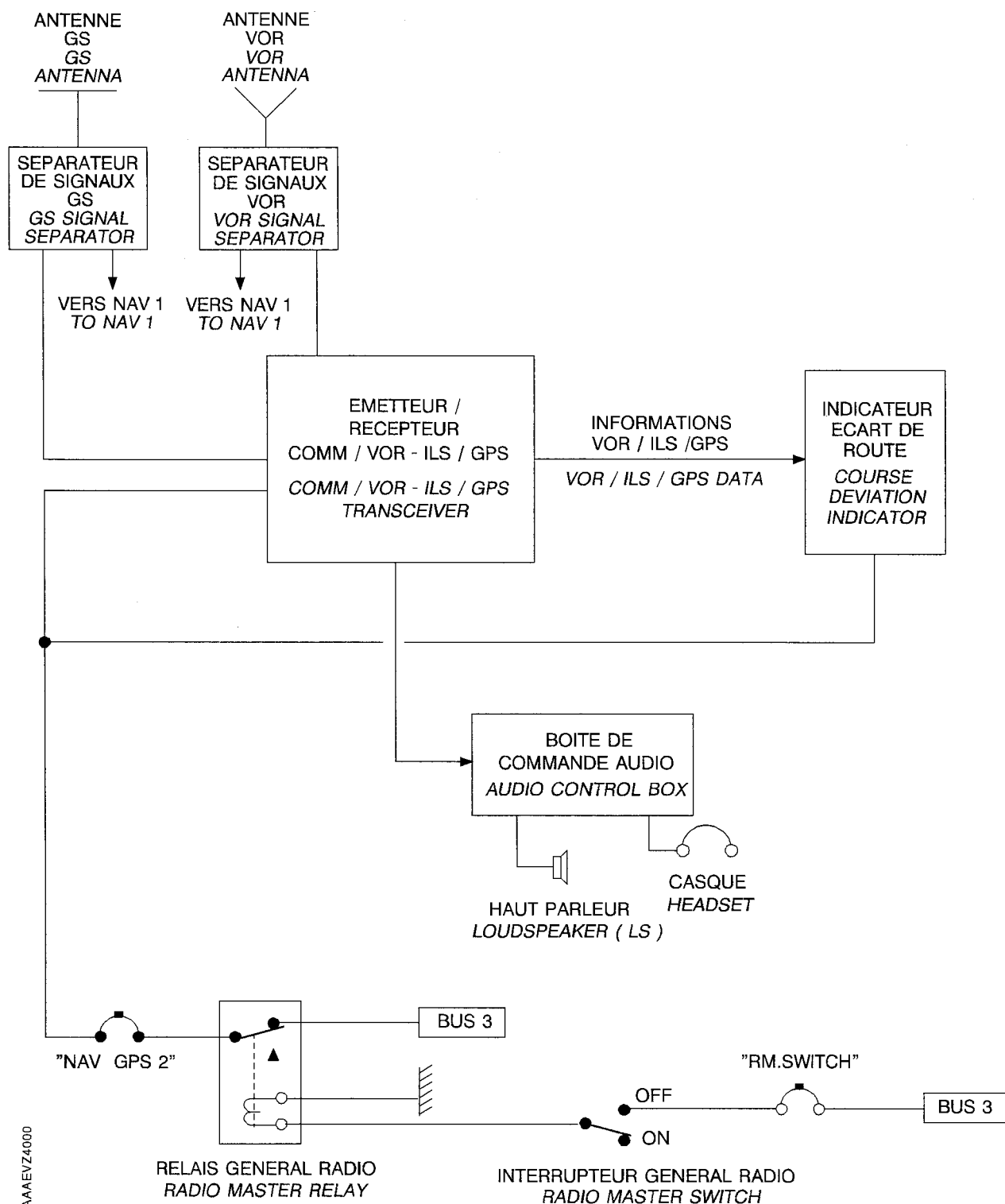
The "CDI" pushbutton on the front panel of the COMM./VOR-ILS/ GPS transceiver enables the selected VOR/ILS or GPS navigation source to be directed towards the course deviation indicator. A "VLOC" or "GPS" message appears on the display above the "CDI" pushbutton to confirm the selection. The same message appears on the front face of the indicator.

A. VOR mode

The COMM./VOR-ILS/GPS transceiver is tuned to the frequency displayed in the VOR/LOC window of the display. The VOR signal is received by the antenna and transmitted to the COMM./VOR-ILS/GPS transceiver via A59 VOR signal separator (if installed). The COMM./VOR-ILS/GPS transceiver converts the VOR signals into DC signals to control the vertical pointer, the "TO-FR" indicator and the related warning flag. The transceiver processes the audio identification signal from the VOR ground station and sends it to A50 audio control panel.

B. ILS mode

When a LOC frequency is selected on the COMM./VOR-ILS/GPS transceiver, the GS receiver automatically tunes to the paired Glide Slope frequency. The LOC and GS signals are received by the VOR and GS antenna and then transmitted to the COMM./VOR-ILS/GPS transceiver via A59 VOR signal separator (if installed) and A60 GS signal separator (if installed) respectively. COMM./VOR-ILS/GPS transceiver converts the LOC and GS signals into DC signals to actuate the vertical pointer, the horizontal pointer and the paired warning flags.



NAV 2 installation – Wiring diagram
Figure 4

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NAV 2 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1 and 1A)

The VOR is a short- and middle-range navigation aid. It enables the pilot to locate the position of his aircraft with regard to a half line (radial) crossing the VOR station or also to determine the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE slope approach plane).

The optional system consists of :

- an A52 VHF NAV / COMM transceiver,
- a M74 course deviation indicator.

The system uses the VOR / LOC antenna, the GS antenna (option), the VOR and GS (option) signal separators. All these elements can be found in NAV 1 installation - refer to 34-51-00.

For the description of communication function of A52 VHF NAV/COMM receiver - refer to 23-13-00.

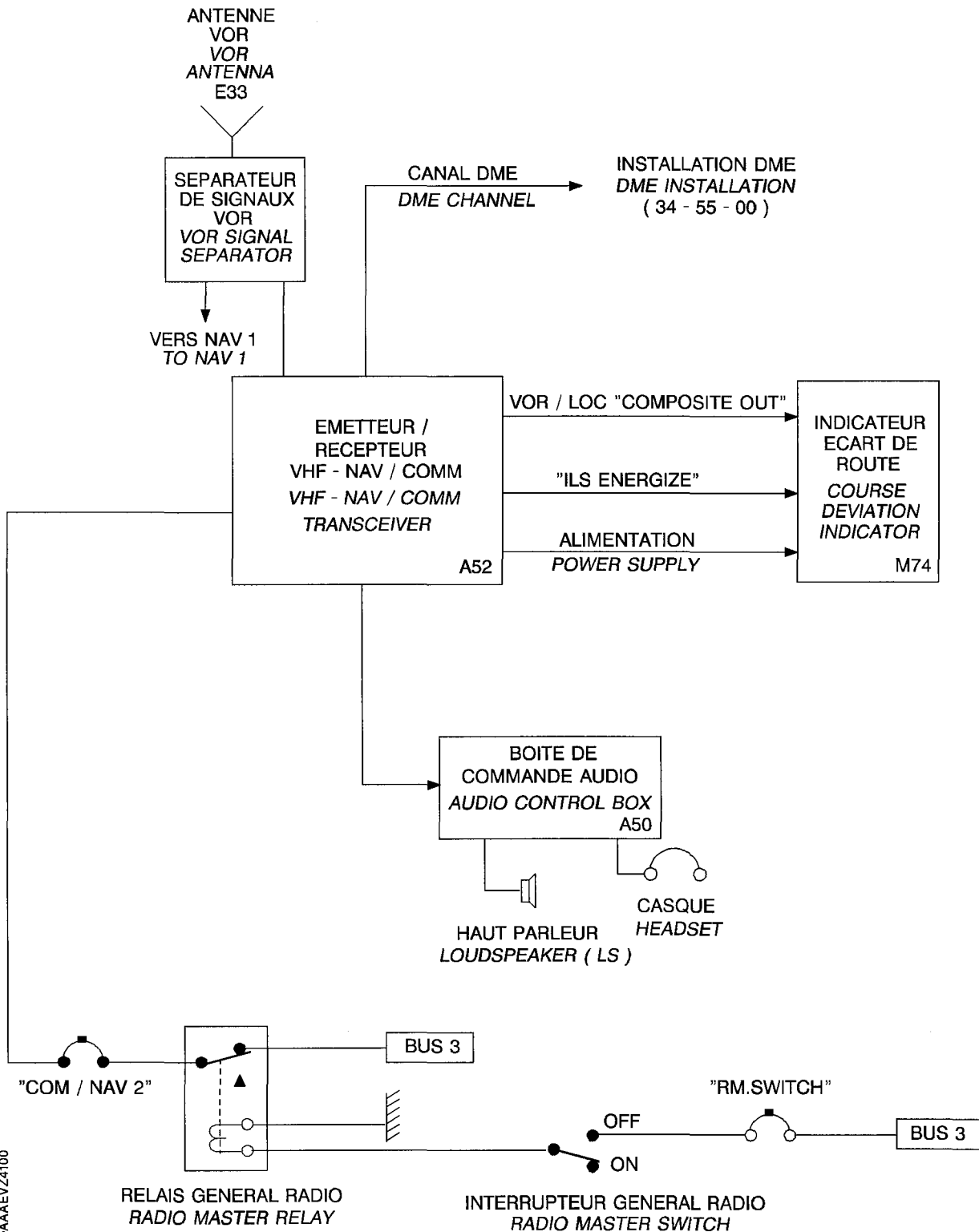
The system is connected with :

- the DME installation (option) - refer to 34-55-00,
- the audio control panel - refer to 23-11-00.

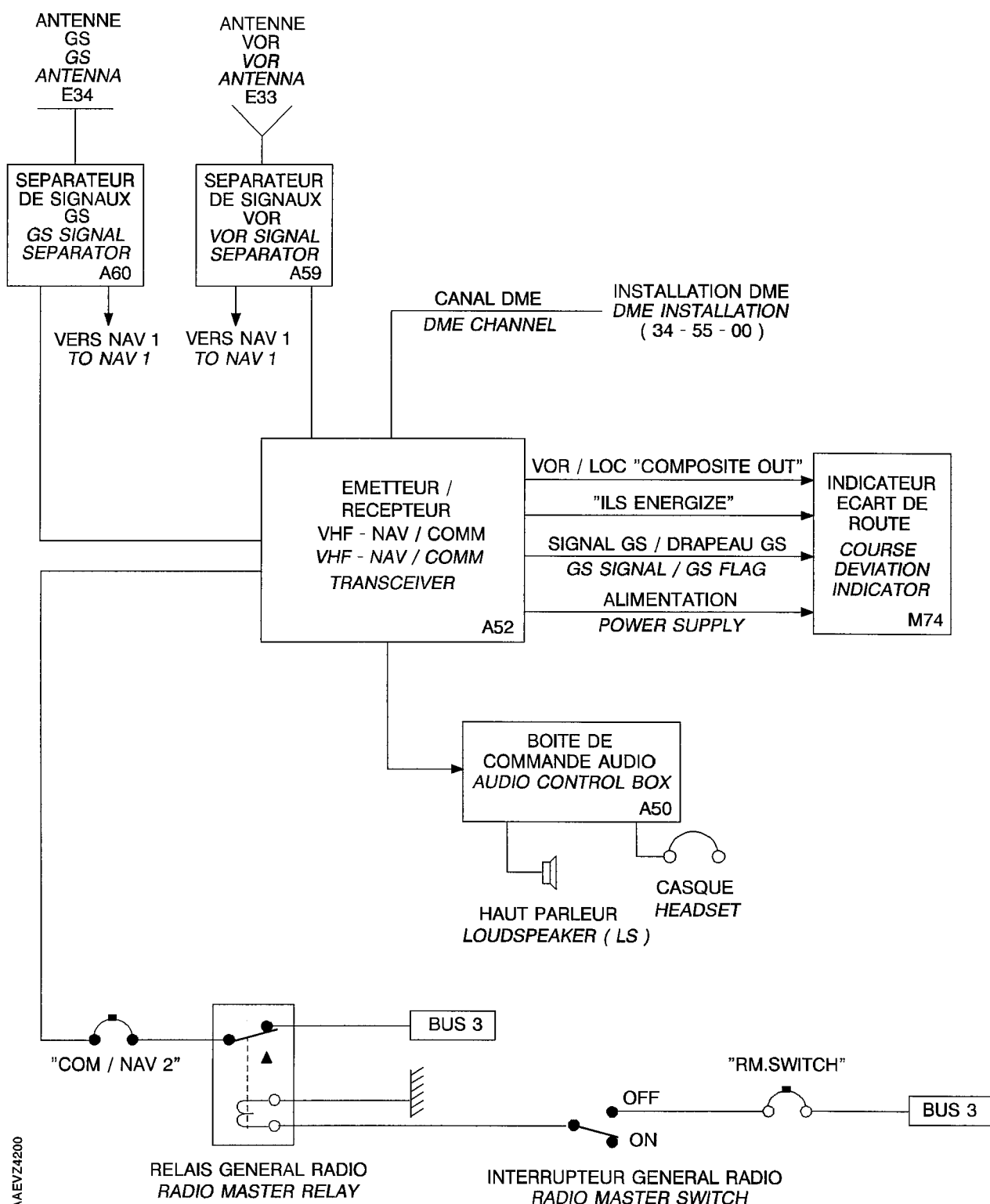
The system is electrically supplied by "BUS 3" bar.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A52 VHF NAV / COMM transceiver	1	251C	/	34-50-00
M74 course deviation indicator	1	251R or 251L	/	34-52-00
Circuit breaker : - CB 88 "COM / NAV 2"	1	230	232L	WM



NAV 2 installation - Schematic
Figure 1 - Without glide slope receiver



14345200AAAEVZ4200

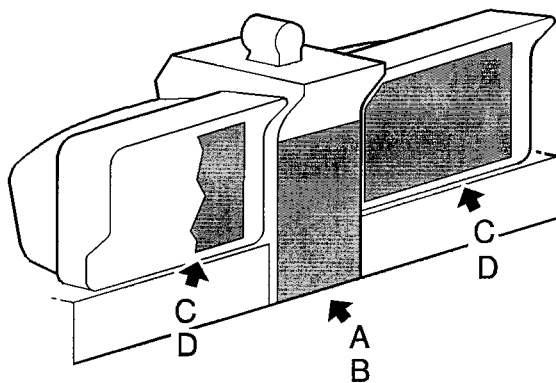
NAV 2 installation - Schematic
Figure 1A - With glide slope receiver

AGAG

Validity : KX 155 / KX 155A

34-52-00 (CE)

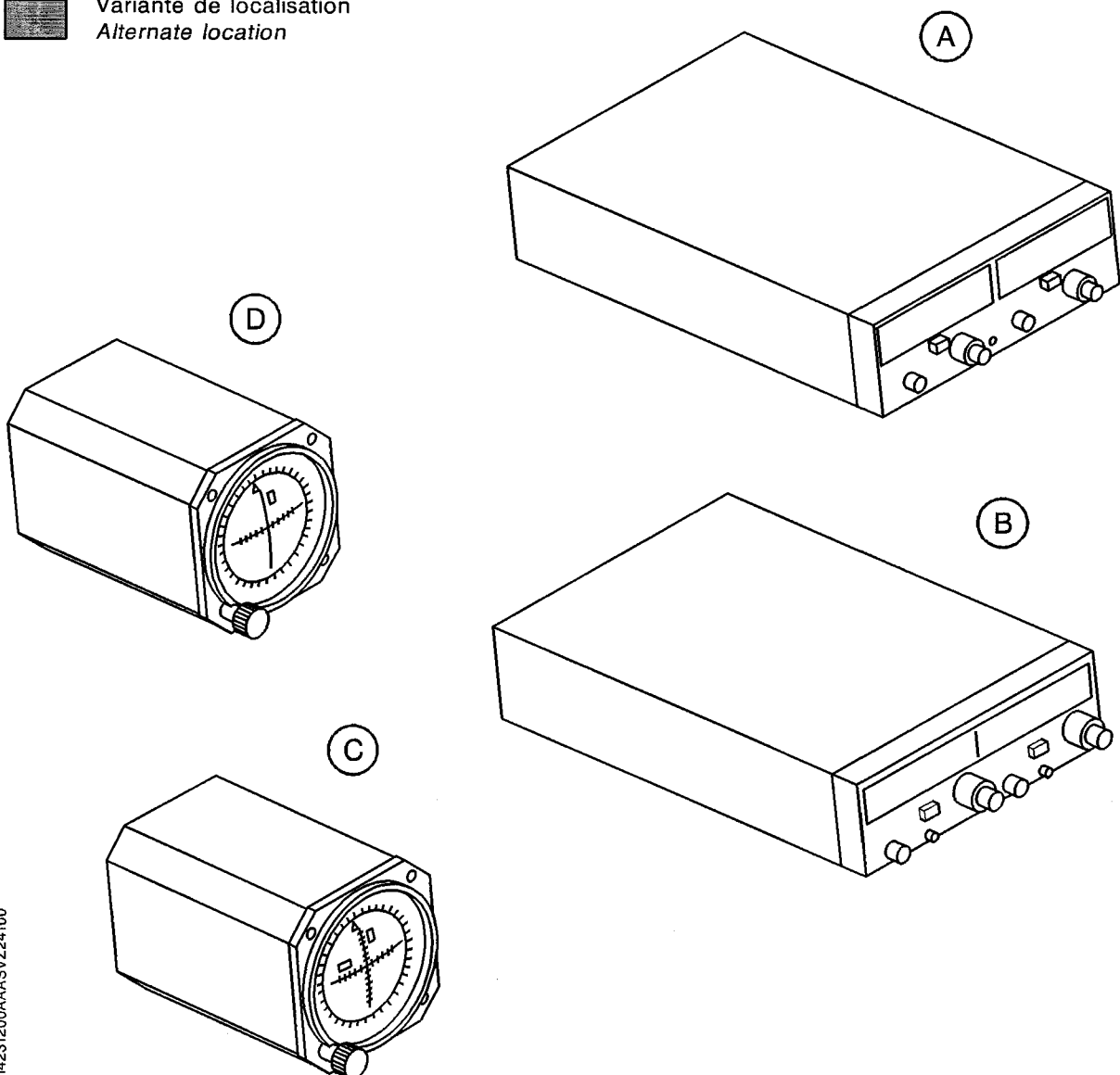
Page 3
NOV 01



- A - A52 VHF NAV/COMM. transceiver (KX 155)
- B - A52 VHF NAV/COMM. transceiver (KX 155A)
- C - M74 course deviation indicator (VOR/ILS information)
- D - M74 course deviation indicator (VOR/LOC information)



Variante de localisation
Alternate location



NAV 2 installation - Identification and location of components
Figure 2

I4231200AAASVZ24100

3. DESCRIPTION

A. A52 VHF NAV/COMM. transceiver (Figure 3)

The VHF NAV/COMM. transceiver is designed for the reception of navigation and guidance signals within a frequency range from 108.00 to 117.95 MHz and as an option for the reception of GS signals within a frequency range from 329.15 to 335.00 MHz. It provides the indicator(s) with NAV/LOC or NAV/ILS information.

Aircraft with KX 155A

All the controls, necessary for equipment operation in navigation mode as well as display, are located on the R.H. section of front panel. It includes :

- the NAV digital display (1) subdivided in two windows. The left window always displays the active frequency and the right "STBY" window displays the standby frequency or, according to the selected mode, navigation information,
- two concentric knobs used to select the active frequency, the standby frequency or data entry according to the selected mode,
- the "↔" pushbutton for NAV frequency transfer, which enables the frequency displayed in the active frequency window to flip-flop with the frequency displayed in the "STBY" window and vice-versa. When pushed in more than two seconds, it also enables to control directly the active frequency via the concentric knobs (if you press momentarily the pushbutton, the active and standby frequency display mode is reactivated),
- the "MODE" pushbutton used to select the CDI, the BEARING or RADIAL mode,
- the "PULL IDENT" button. When this button is pulled out, the identification code of the ground station sounds through A50 audio control panel. To adjust the audio level, rotate this button. When the "PULL/IDENT" button is pushed in, the identification code is attenuated,
- the "OFF/PULL TEST" button which energizes the VHF NAV/COMM transceiver.

All

The VHF NAV/COMM. transceiver is electrically supplied by "BUS 3" bar via the radio master relay and protected by CB 88 "COM/NAV 2" circuit breaker.

The VHF NAV/COMM. transceiver is mounted on the radio rack.

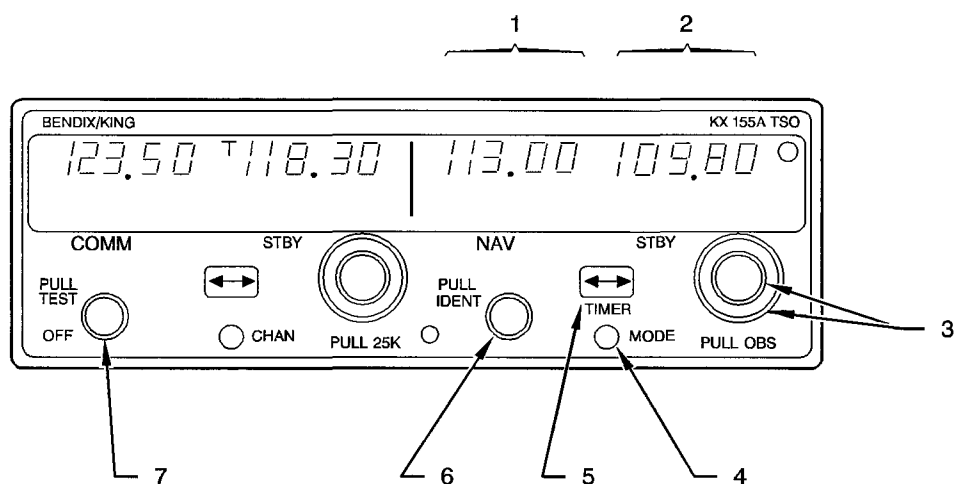
B. M74 course deviation indicator

The indicator displays Glide Slope information and, after conversion, the VOR/LOC information provided by the VHF NAV/COMM. transceiver.

The front panel of the indicator includes :

- the "OBS" button used to adjust the desired radial under the lubber line by moving the compass card,
- the horizontal pointer (option) showing the Glide Slope route position relative to aircraft position,
- the vertical pointer showing the VOR course deviation or the LOC course position relative to aircraft position,
- The "TO/FR" flag showing "TO" if the aircraft flies towards the selected ground station or "FR" when the aircraft goes in the opposite direction.
- A VOR/LOC warning flag which appears to show that the received signals cannot be used.
- A Glide Slope warning flag (option) which appears to show that the received signals cannot be used.

- 1 - Active frequency window
- 2 - "STBY" frequency window
- 3 - Concentric knobs
- 4 - "MODE" pushbutton
- 5 - "↔" pushbutton
- 6 - "PULL IDENT" button
- 7 - "OFF/PULL TEST" button



NAV 2 installation – A52 VHF NAV/COMM. transceiver
Figure 3 - KX 155A

14231200AA SVZ4101

It is electrically supplied by the VHF NAV/COMM. transceiver.

The indicator is mounted on the LH. or R.H. instrument panel.

4. OPERATION

The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

A. VOR/LOC mode

The VHF NAV/COMM. transceiver is tuned to the frequency displayed in the active frequency window of the NAV display. The VOR/LOC signal is received by the antenna and transmitted to the VHF NAV/COMM. transceiver via the VOR signal separator. The transceiver detects and amplifies the signal to produce a composite VOR/LOC signal. The course deviation indicator receives this signal and converts it into DC signals to control the vertical pointer, the "TO/FR" flag and the paired warning flag.

The transceiver processes the audio identification signal from the VOR ground station and sends it to A50 audio control panel.

B. Glide Slope mode (option)

When a LOC frequency is selected on the VHF NAV/COMM. transceiver, the internal GS receiver automatically tunes to the paired Glide Slope frequency. The signal received by the GS antenna is then transmitted to the VHF NAV/COMM. transceiver via the GS signal separator. The transceiver detects and amplifies the signal to produce DC signals to actuate the horizontal pointer and the warning flag paired with the course deviation indicator.

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NAV 2 INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1 and 1A)

The VOR is a short- and middle-range radio-navigation aid. It allows the pilot to locate the position of his aircraft with regard to a half line crossing the VOR station (radial) or also to know the particular radial crossing the aircraft position.

In ILS operation (landing aid), the system allows a continuous guidance in azimuth (LOC) and in elevation (GLIDE).

The optional system consists of :

- a navigation receiver,
- a course deviation indicator (CDI).

The system uses the VOR / LOC antenna, the GS antenna (option), the VOR and GS (option) signal separators. All these elements are known at the NAV 1 installation – refer to 34-51-00.

The NAV 2 navigation system is connected with :

- the optional DME installation – refer to 34-55-00,
- the audio control box – refer to 23-11-00.

The navigation receiver is a 200-channel VHF VOR / LOC receiver with a 40 channel glideslope receiver / converter option.

The CDI can include an UP / DOWN glideslope needle with an associated warning flag.

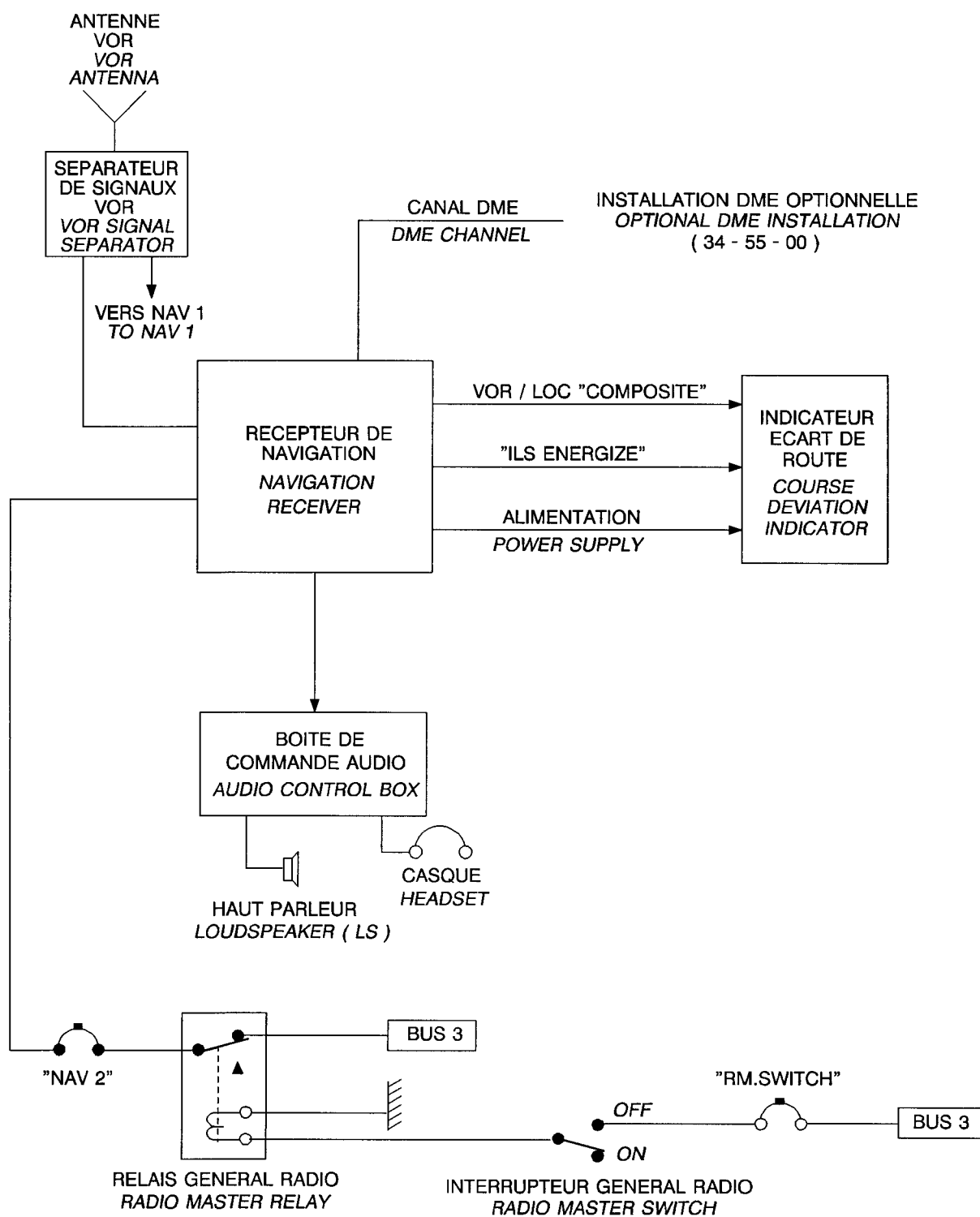
The system is electrically supplied by "BUS 3" bar via the "NAV 2" circuit breaker.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Navigation receiver	1	251C	/	34-50-00
Course deviation indicator	1	251R or 251L	/	34-52-00
Circuit breaker : - "NAV 2"	1	230	232L	WM

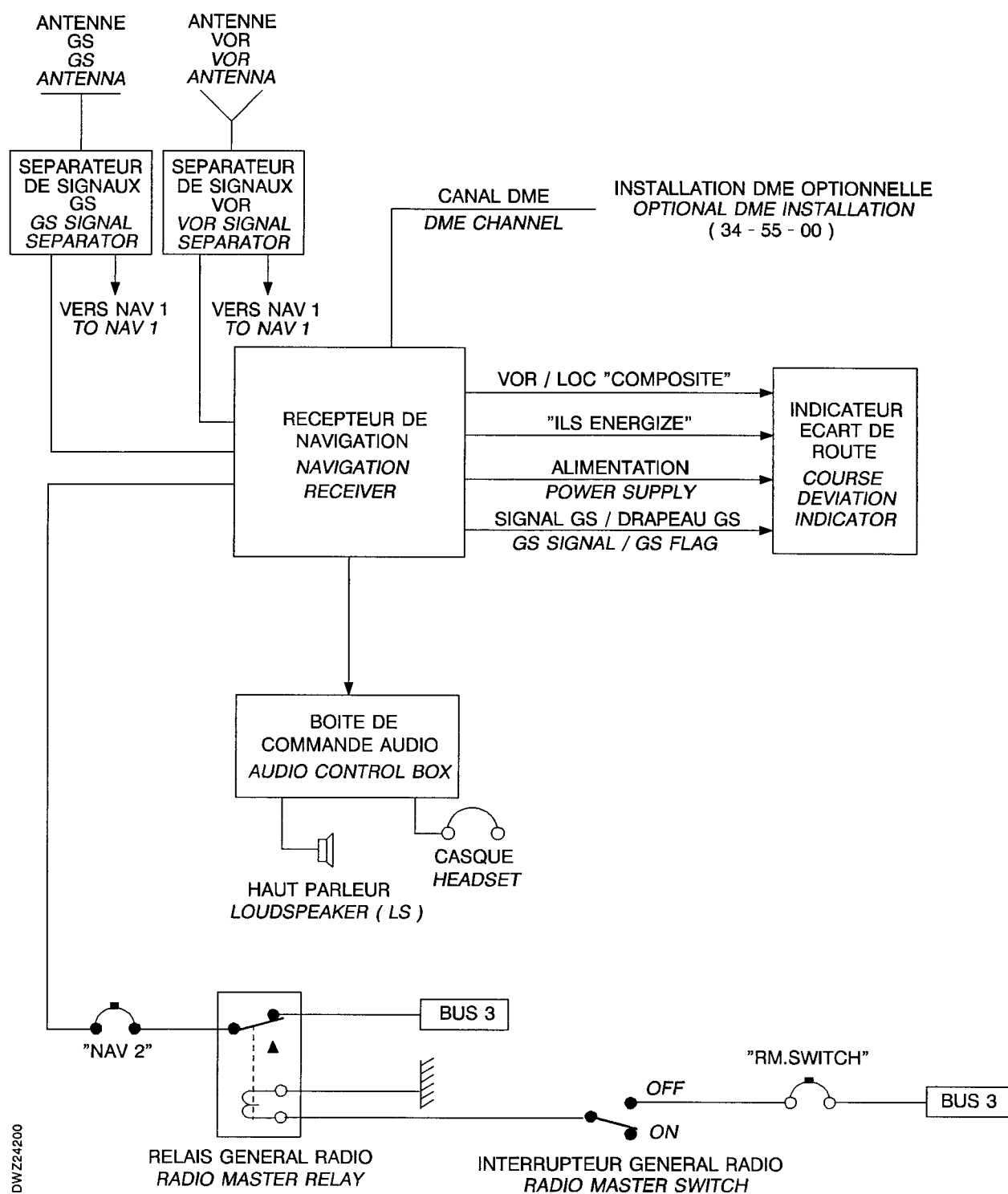
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

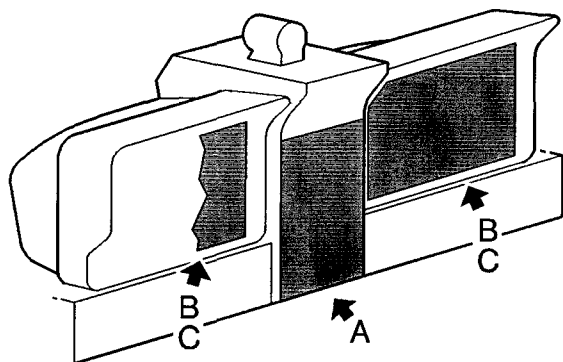


I4345200AAADW Z24100

NAV 2 installation - Electrical schematic
Figure 1 - Without glideslope

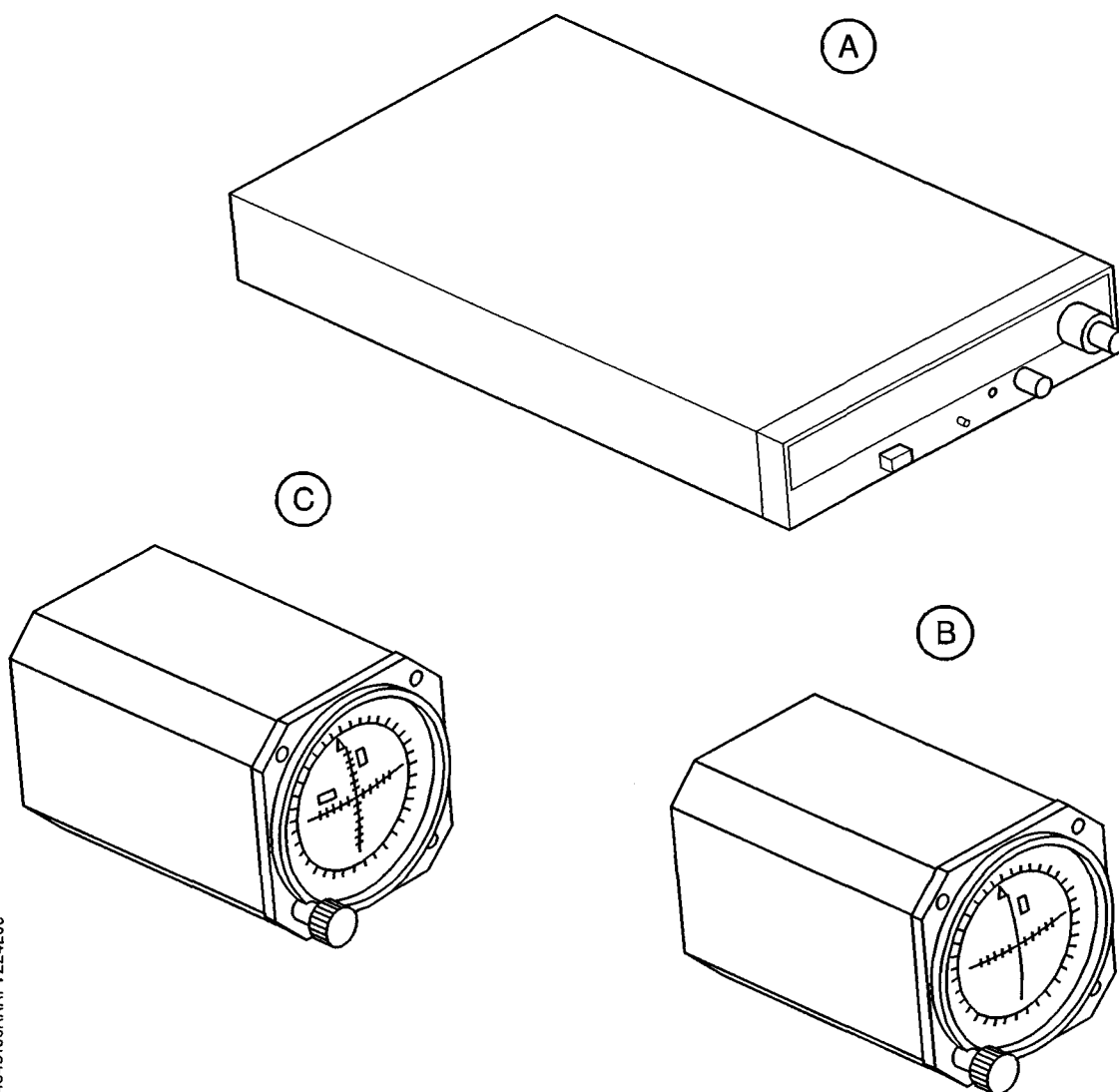


NAV 2 installation - Electrical schematic
Figure 1A - With glideslope



- A - Navigation receiver
- B - Course deviation indicator
(VOR / LOC information)
- C - Course deviation indicator
(VOR / ILS information)

 Variante de localisation
Alternate location



NAV 2 installation - Identification and location of components
Figure 2

TRANSPONDER

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1, 1A, 1B and 1C)

The transponder allows the operational air traffic service to identify the aircraft.

The optional system consists of :

- an A56 transponder,
- an E36 antenna,
- a conversion kit (28 volts only).

The transponder can receive altitude information from the optional encoding altimeter or altitude encoder - refer to 34-11-00.

A desensitization line connects the transponder to the optional DME installation - refer to 34-55-00.

14-volt aircraft

The transponder is electrically supplied by "BUS 1" or "BUS 2" or "BUS 3" bar(s) via the "ATC" circuit breaker.

28-volt aircraft

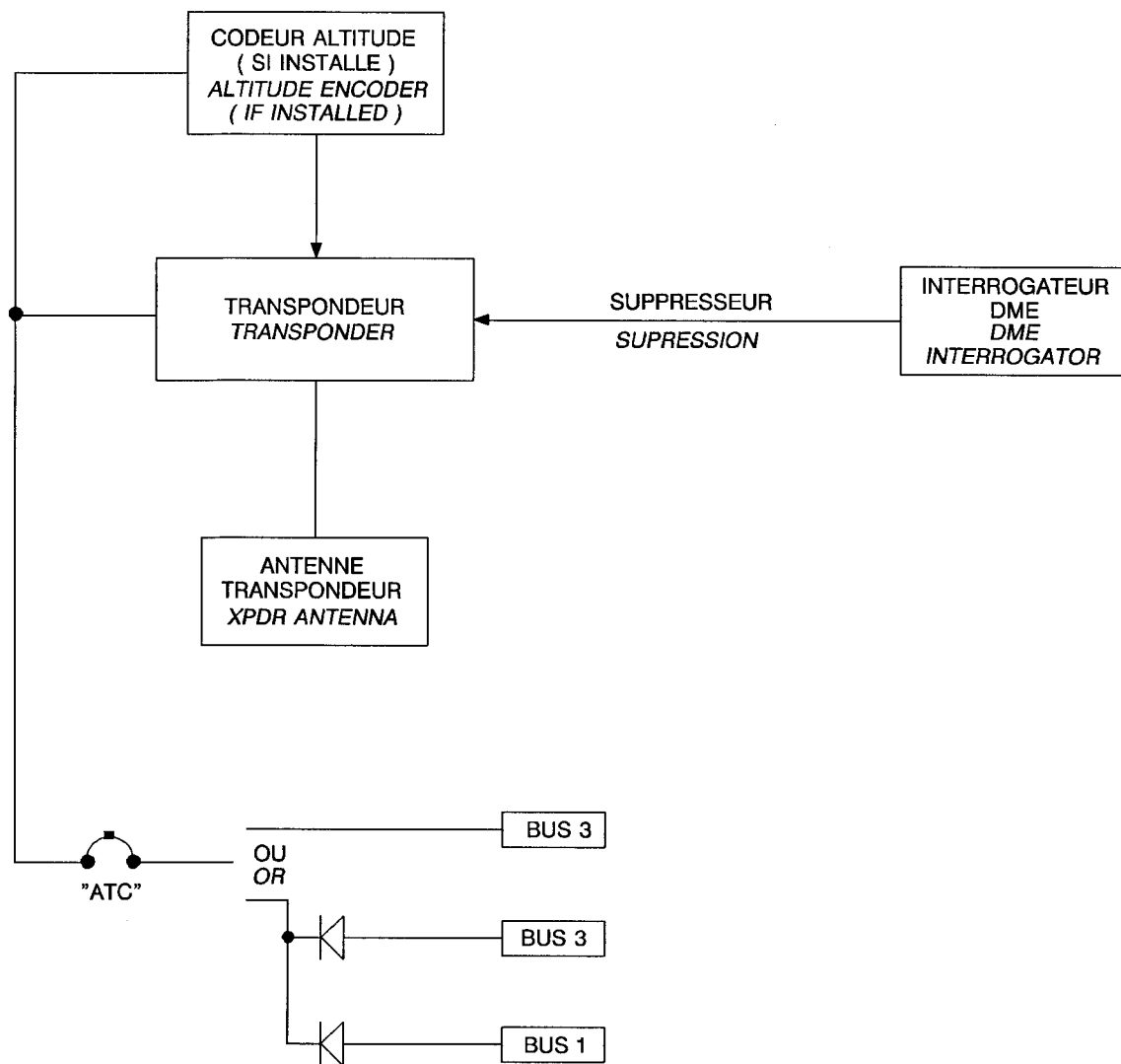
The transponder is electrically supplied by "BUS 1" and / or "BUS 2" bar(s) via the "XPDR" circuit breaker.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A56 transponder	1	251C	/	34-50-00
E36 antenna	1	210	215	34-53-03
E012 conversion kit	1	250	211R	34-53-00
Circuit breakers :				
- "XPDR"	1	230	232L	WM
- "ATC"	1	230	232L	WM

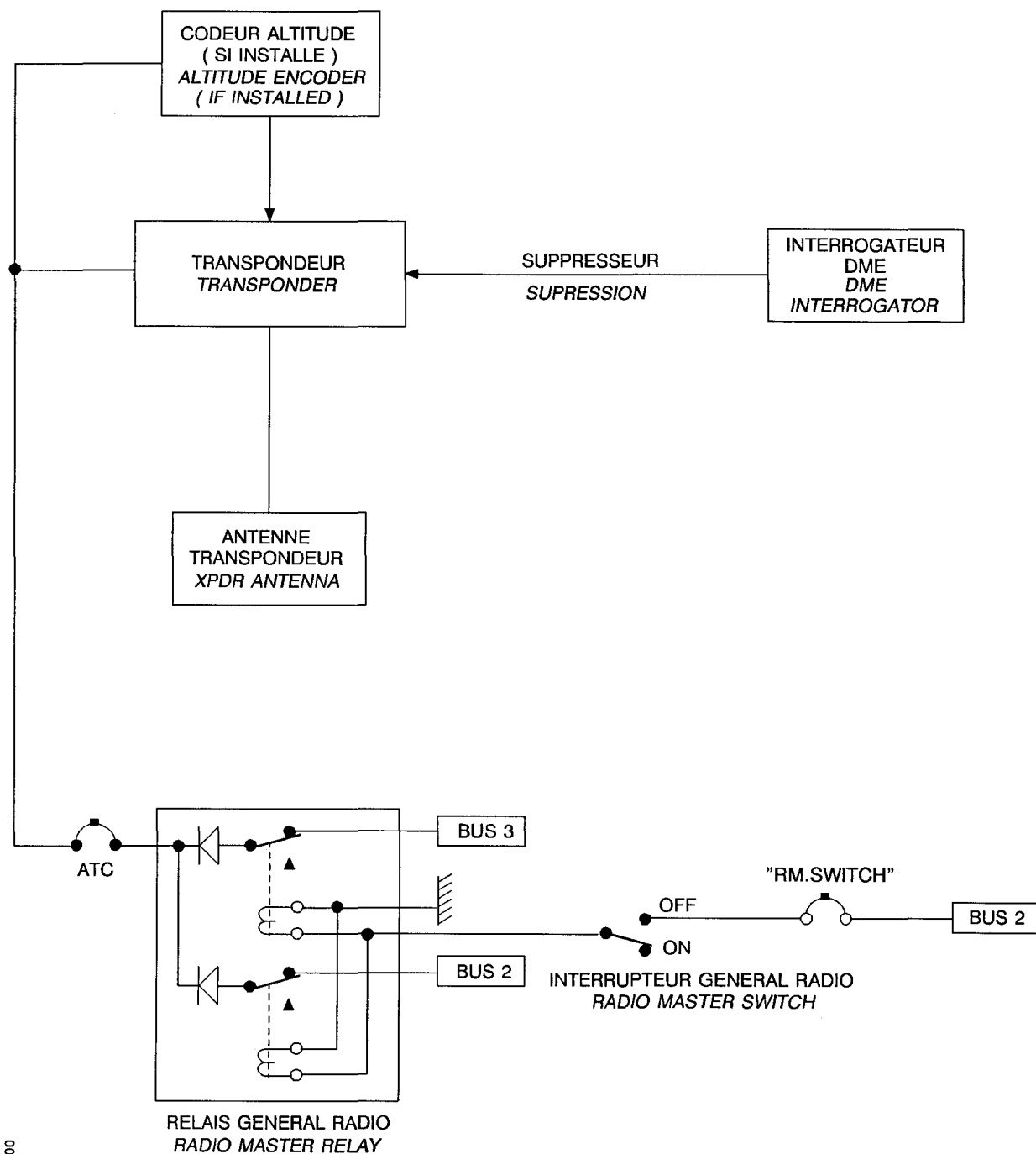
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



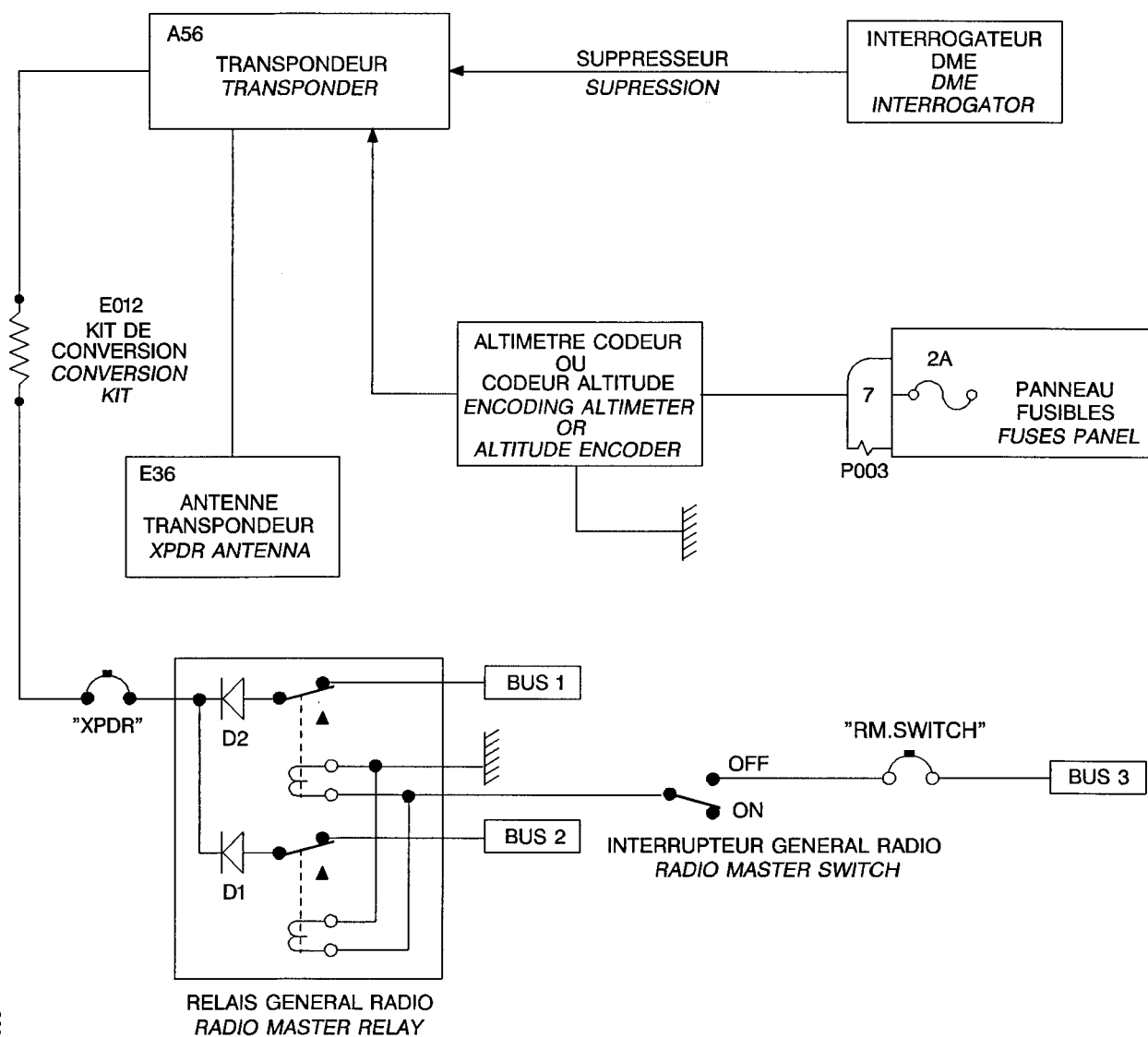
14345300AAA CWZ4100

Transponder - Electrical schematic
Figure 1 - 14 volts without radio master



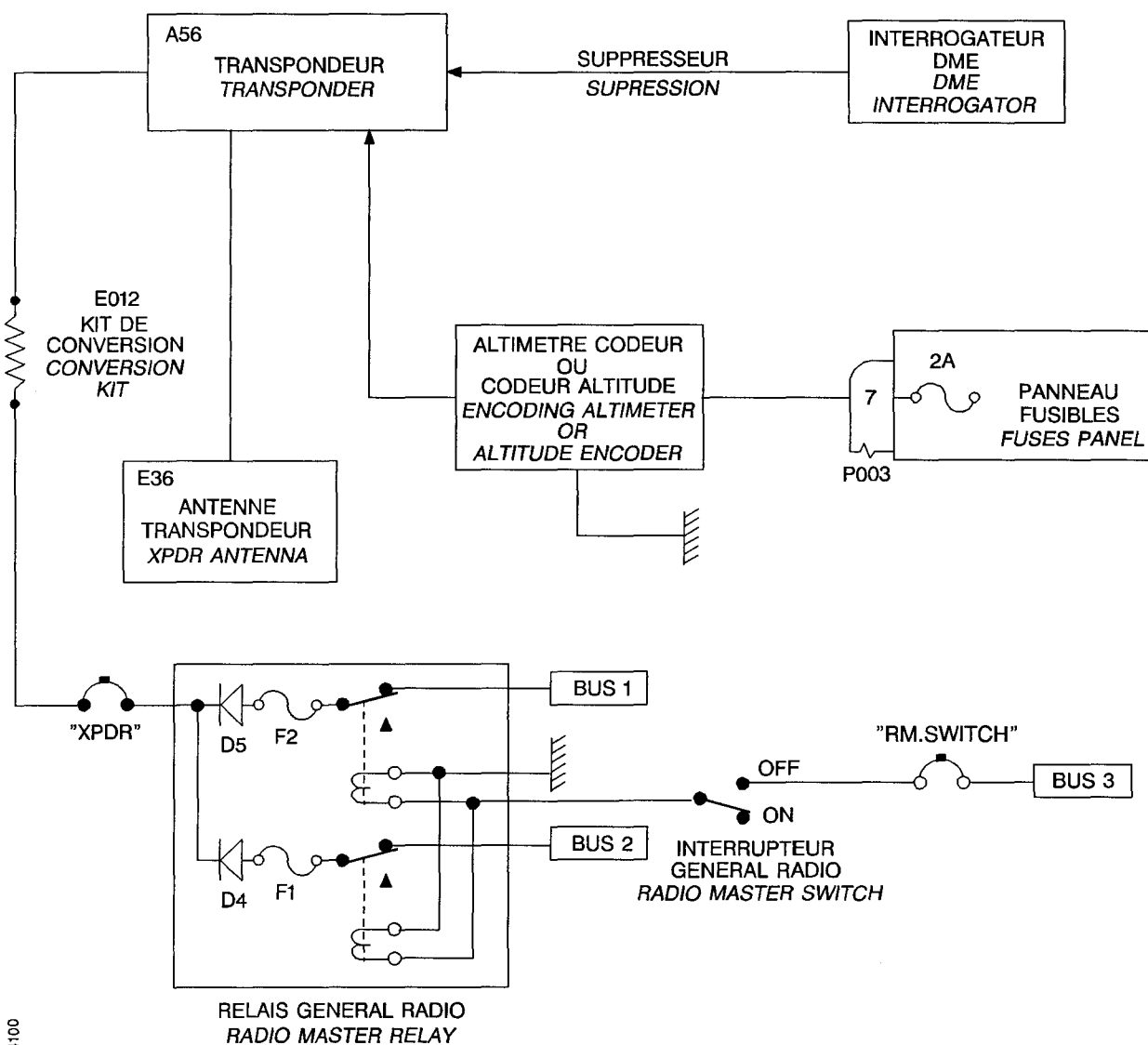
14345300AAACWZ4200

Transponder - Electrical schematic
Figure 1A - 14 volts with radio master



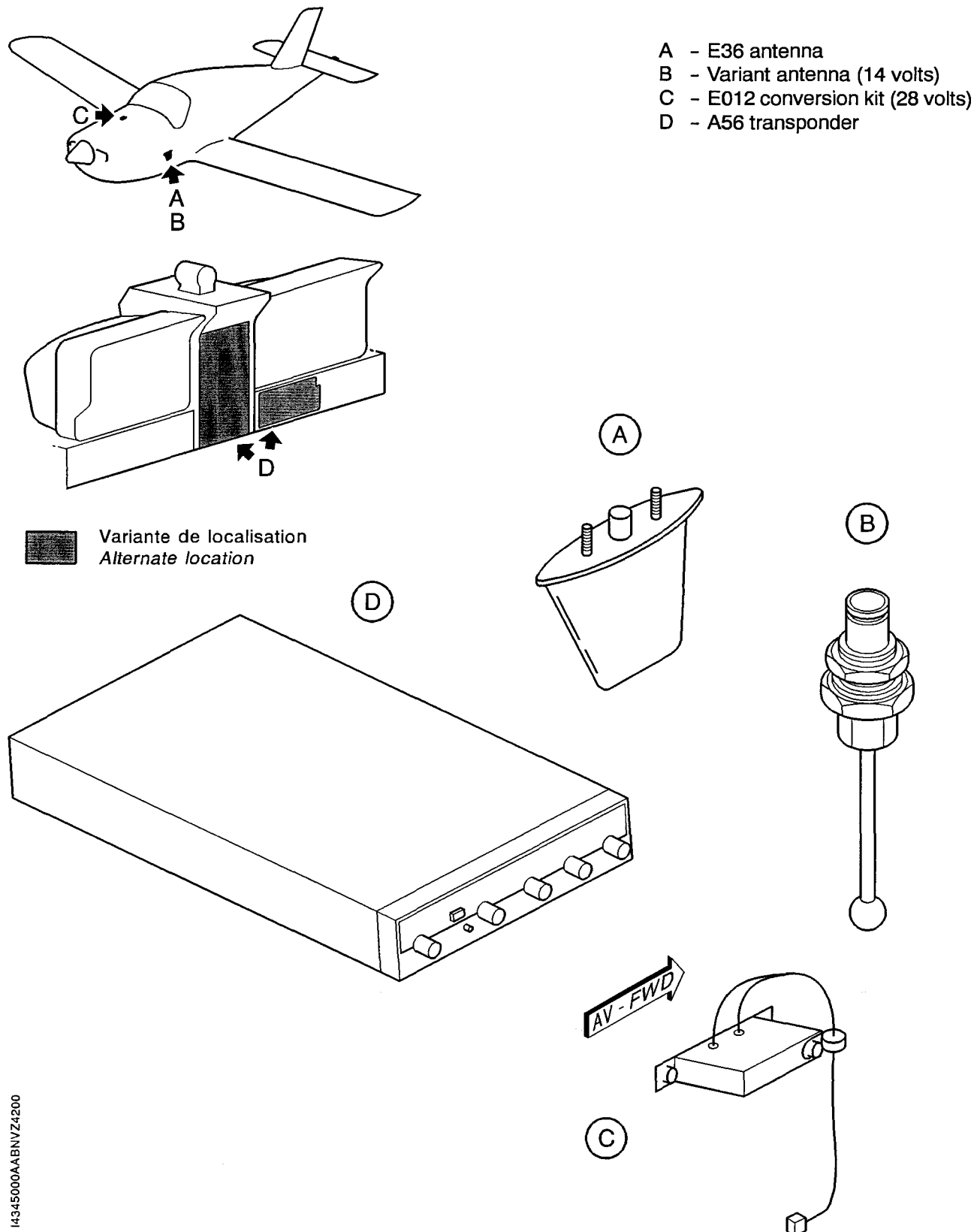
14345300AAACWZ14000

Transponder - Electrical schematic
Figure 1B - 28 volts with 3-relay master radio board



14345300AAACWZ14100

Transponder - Electrical schematic
Figure 1C - 28 volts with 4-relay master radio board



Transponder - Identification and location of components
Figure 2

TRANSPONDER

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The transponder is an integral part of the Air Traffic Control Radar Beacon System (ATCRBS).

The transponder allows the operational air traffic service to identify the aircraft.

The optional system consists of :

- the A56 transponder,
- the E36 transponder antenna.

The transponder receives altitude information from the optional encoding altimeter - refer to 34-11-00.

A desensitization line connects A56 transponder to the optional DME installation - refer to 34-55-00.

The transponder is electrically supplied by "BUS 1" and / or "BUS 2" bar(s) via the master radio relay.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A56 transponder	1	254R or 251C	/	34-50-00
E36 transponder antenna	1	210	215	34-53-03
Circuit breaker : - CB90 "XPDR"	1	230	232L	WM

3. DESCRIPTION

A. A56 transponder

A56 transponder transmits a coded response to an interrogation transmitted by an air traffic control ground radar station. The coded response contains the aircraft identification code and altitude information.

A56 transponder is a rectangular box installed in a mounting tray. Connections are made through one electrical connector and an antenna connector on the back panel.

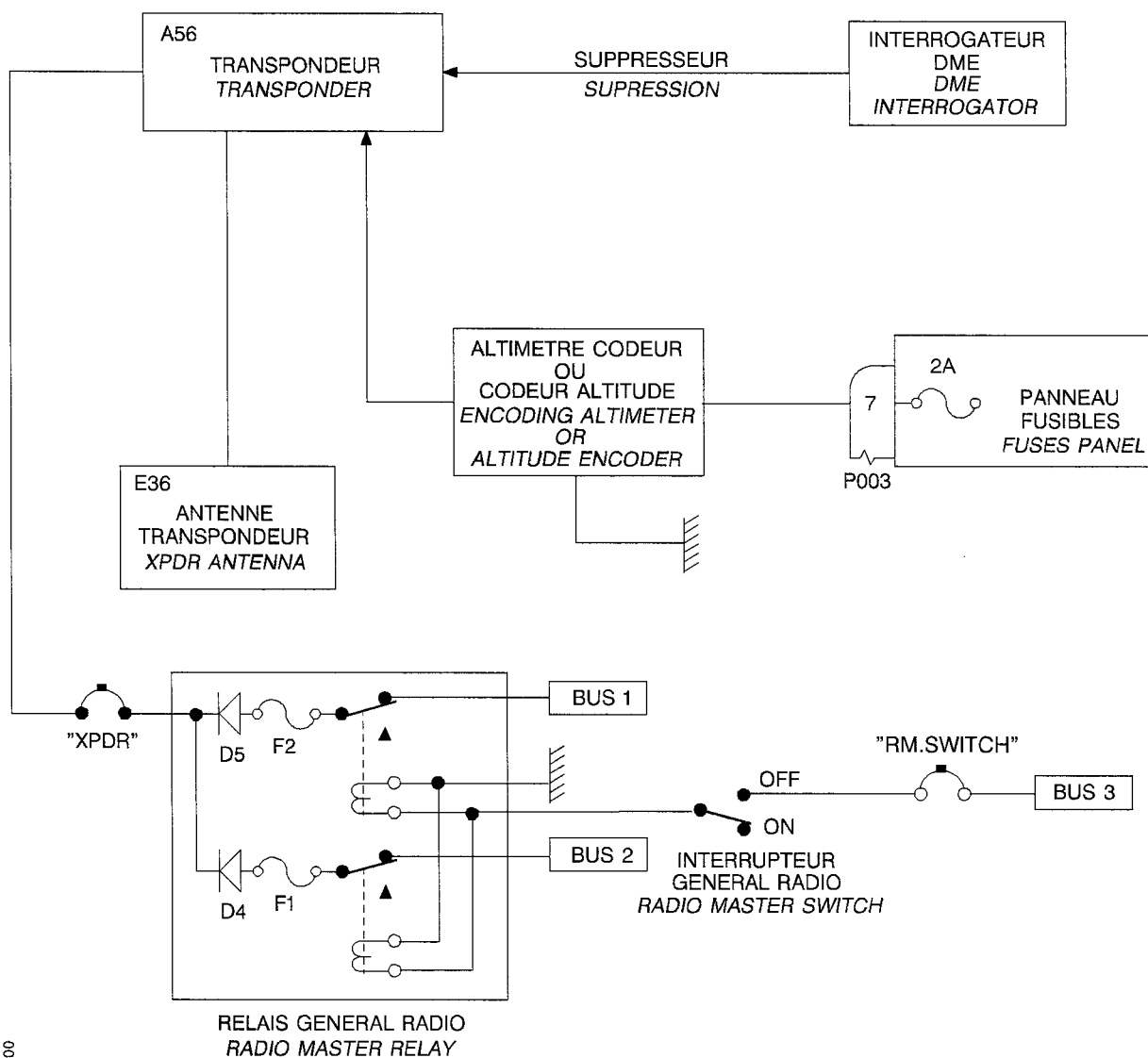
On the front panel, mode and code selection are performed by the rotary knob and push-button switches. All functions including flight level altitude and identification code are shown on the gas discharge display.

On the ground, the secondary radar sends interrogations to the aircraft to which A56 transponder provides a response.

To each interrogation from the secondary radar, A56 transponder transmits :

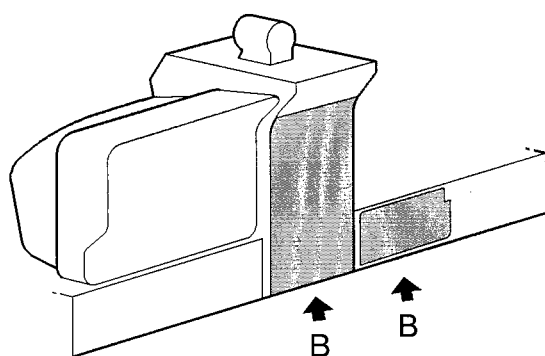
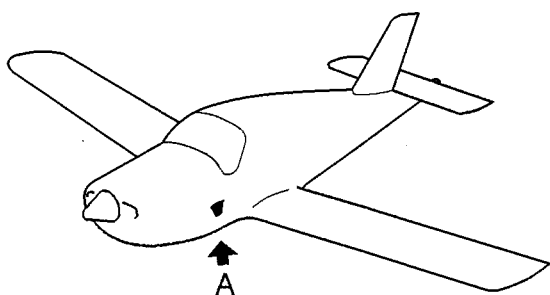
- a coded response corresponding to the aircraft identification code assigned by the ground control station (mode A),
- the identification code and a coded response indicating the aircraft flight level (mode C).

The interrogation and the response of A56 transponder are transmitted on two different frequencies (1030 MHz and 1090 MHz).

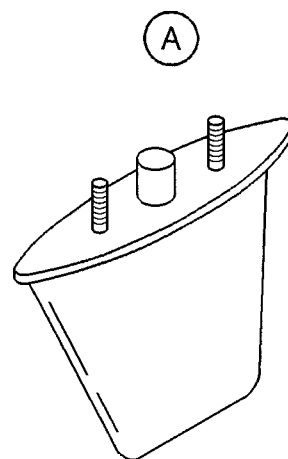


Transponder - Electrical schematic
Figure 1

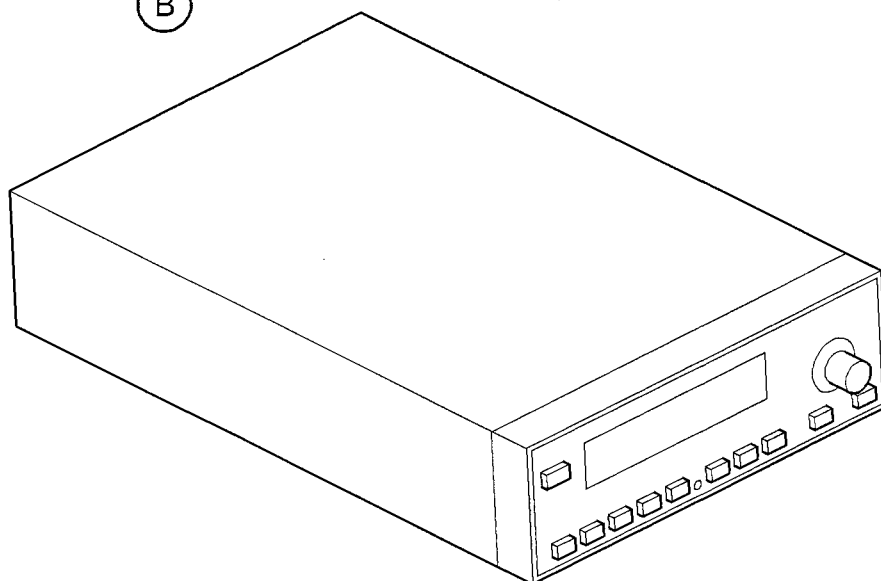
- A - E36 antenna
- B - A56 transponder



 Variante de localisation
Alternate location



(B)



I4345300AAADVZ4101

Transponder - Identification and location of components
Figure 2

A56 transponder is electrically supplied by "BUS 1" and / or "BUS 2" bar(s) via master radio relay and protected by CB90 "XPDR" circuit breaker.

A56 transponder is mounted on the R.H. panel strip or in the radio rack (alternate location).

B. E36 transponder antenna

E36 transponder antenna allows signal reception and transmission within the L band (Frequency within 950 and 1260 MHz).

E36 transponder antenna is mounted under the fuselage on inspection door 215.

4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

A56 transponder energization is obtained by means of RADIO MASTER switch.

When the function selector knob is set to "ON", the transponder replies to identification interrogations in "A" mode.

When A56 transponder is operating in "C" mode (function selector knob set to "ALT"), the altitude data provided by encoding altimeter are transmitted to the ground station. A56 transponder displays, in the L.H. portion of its display window, a Flight Level "FL" in hundreds of feet. The displayed altitude is not the true altitude but the barometric altitude not corrected by the local pressure (reference pressure 29.92 inches of mercury that is 1013.25 hPa).

Example : If the display reads FL 075, the transmitted altitude is 7500 ft.

TRANSPONDER

DESCRIPTION AND OPERATION

1. GENERAL

The transponder is an integral part of the Air Traffic Control Radar Beacon System (ATCRBS).

The transponder allows the operational air traffic service to identify the aircraft.

The system consists of :

- the A56 transponder,
- the E36 transponder antenna.

The transponder receives altitude information from the encoding altimeter (option) - refer to 34-11-00.

A desensitization line connects A56 transponder to the DME installation (option) - refer to 34-55-00.

The transponder is electrically supplied by "BUS 1" and/or "BUS 2" bars.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A56 transponder	1	251C	/	34-50-00
E36 transponder antenna	1	210	215	34-53-03
Circuit breaker : - CB 90 "XPDR"	1	PL1	/	WM
Fuses : - F1 and F2	2	U15	/	WM

3. DESCRIPTION

A. A56 transponder (Figure 2)

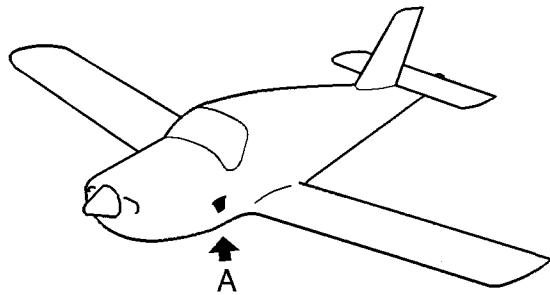
A56 transponder transmits a coded response to an interrogation transmitted by an air traffic control ground radar station. The coded response contains the aircraft identification code and altitude information.

A56 transponder is a rectangular box installed in a rack. Connections are made through an electrical connector and an antenna connector on the back panel.

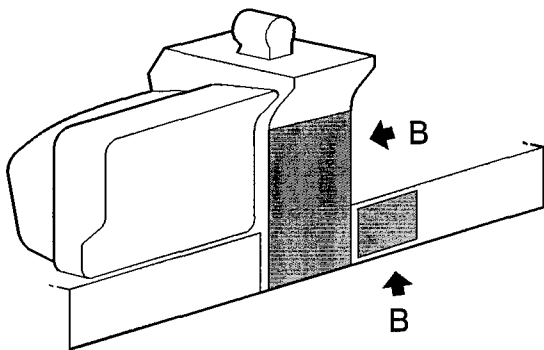
On the front panel, mode and code selection are performed by the rotary knobs.

The front face of A56 transponder features :

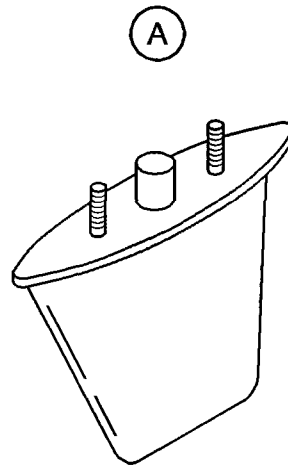
- a function selector knob (3) for equipment energization and selection of the different operation modes :
 - . "OFF" position : The transponder is de-energized.
 - . "SBY" position : The A56 transponder is energized but is inhibited from replying to any ground interrogation.



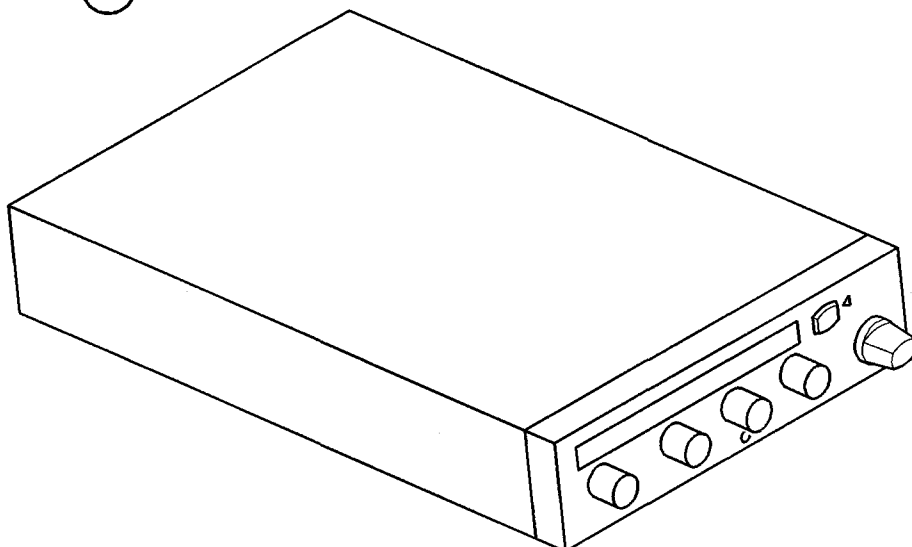
- A - E36 transponder antenna
- B - A56 transponder



 Variante de localisation
Alternate location



(B)



Transponder - Identification and location of components
Figure 1

14345300AAAADVZ4200

- . "ON" position : During normal operation, the transponder retransmits the identification code displayed on the front panel of the equipment.
 - . "ALT" position : The transponder retransmits the identification code and the aircraft altitude (mode C).
 - . "TST" position : Unstable position that must be held momentarily during the test. It enables the pilot to check the indicator light.
- an indicator light (2) that illuminates each time the transponder sends a response to the ground station interrogations.
 - four knobs (4) are provided to separately select each digit of the identification code.
 - an "IDENT" pushbutton (1) used to transmit a special identification pulse to help the radar operator.

A56 transponder receives a coded interrogation transmitted by the air traffic control ground radar station on a 1030-MHz carrier. A56 transponder decodes and processes the interrogations and sends a coded response on a 1090-MHz carrier.

A56 transponder is electrically supplied by "BUS 1" and/or "BUS 2" bars via a diode and a fuse respectively. The transponder is protected by CB 90 "XPDR" circuit breaker.

A56 transponder is mounted on PL30 radio rack.

B. E36 transponder antenna

Transponder antenna allows signal reception and transmission within the L band (frequency within 950 and 1260 MHz).

Transponder antenna is mounted under the fuselage on the cowling under hull.

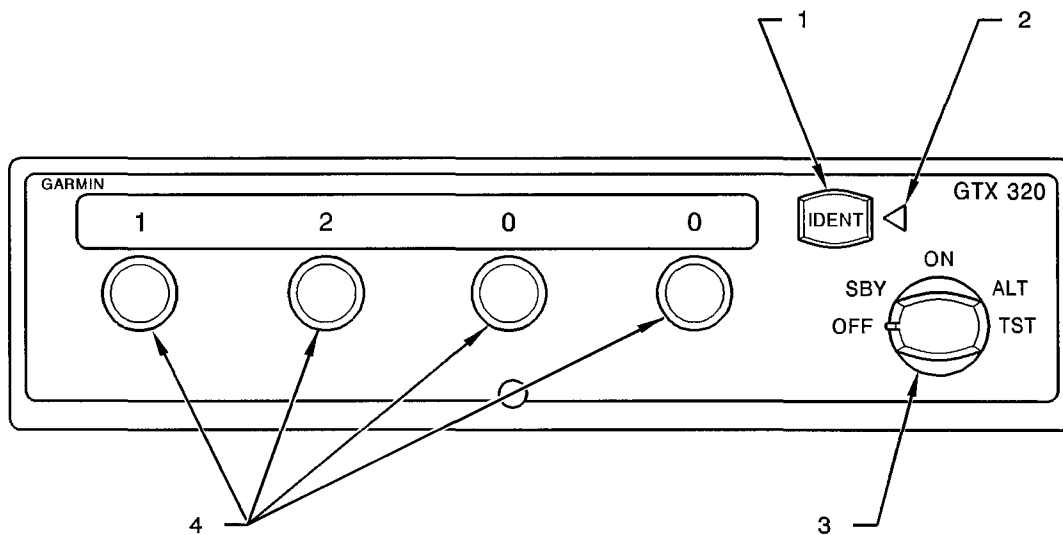
4. OPERATION (Figure 3)

A56 transponder energization is obtained by means of "RADIO MASTER" switch.

When the function selector knob is set to "ON", the transponder replies to mode A identification interrogations. The identification code, entered into the transponder by means of the code selector knobs, is transmitted to the ground station.

When A56 transponder is operating in mode C (Function selector knob set to "ALT"), the altitude data provided by M76 encoding altimeter are transmitted to the ground station.

- 1 - "IDENT" pushbutton
- 2 - Indicator light
- 3 - Function selector knob
- 4 - Knob

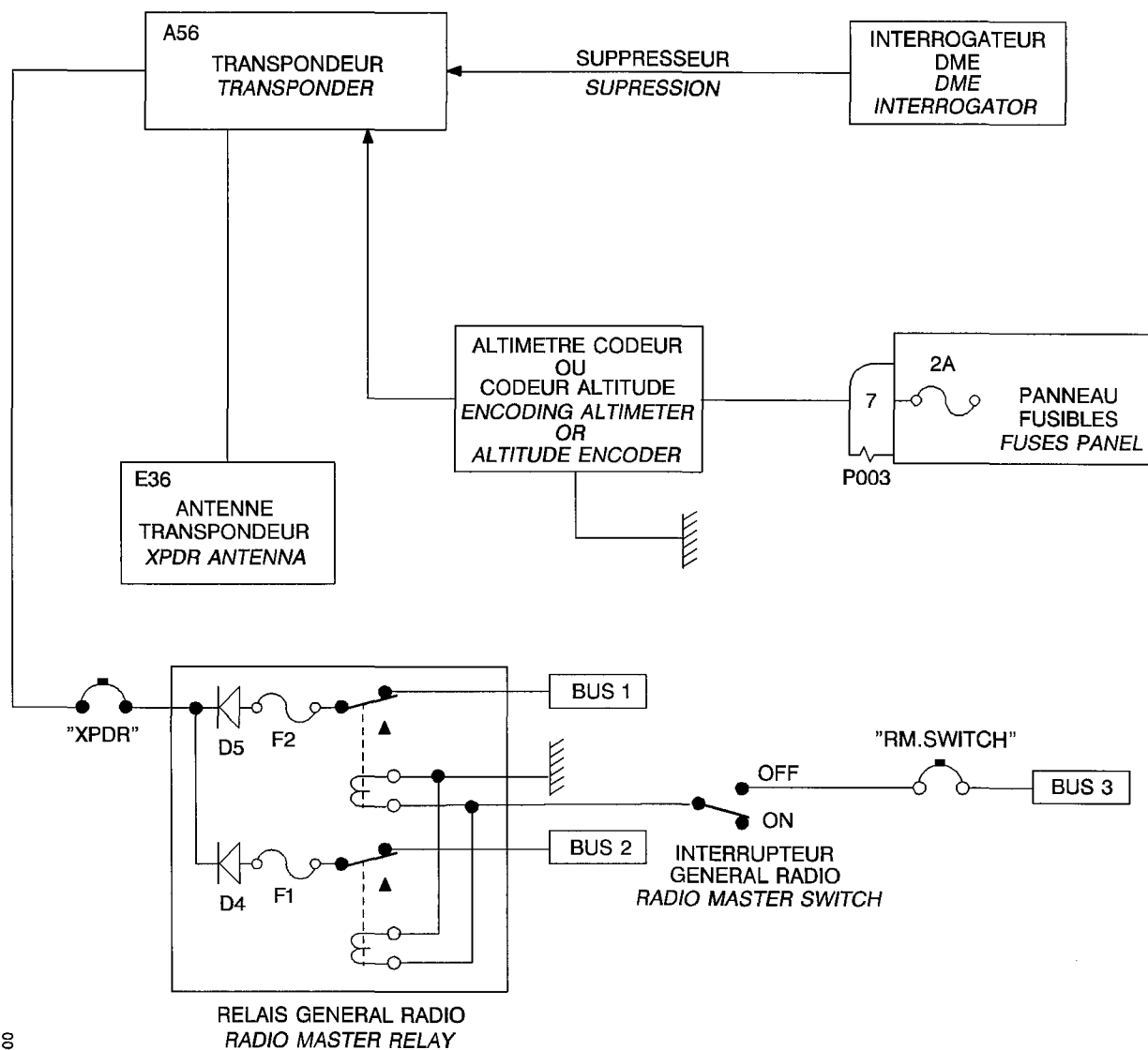


Transponder - A56 transponder
Figure 2

I4345300AAADV Z14000

AGAF
Validity : GTX 320

34-53-00 (BQ) Page 4
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14345300AAACWZ24100

A56 transponder - Schematic
Figure 3

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TRANSPONDER

DESCRIPTION AND OPERATION

1. GENERAL

The transponder is an integral part of the Air Traffic Control Radar Beacon System (ATCRBS).

The transponder allows the operational air traffic service to identify the aircraft.

The system consists of :

- the A56 transponder,
- the E36 transponder antenna.

The transponder receives altitude information from the encoding altimeter - refer to 34-11-00.

A desensitization line connects A56 transponder to the DME installation - refer to 34-55-00.

The transponder is electrically supplied by "BUS 1" and/or "BUS 2" bars.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A56 transponder	1	251C or 254R	/	34-50-00
E36 transponder antenna	1	210	215	34-53-03
Circuit breaker : - CB 90 "XPDR"	1	PL1	/	WM
Fuses : - F1 and F2	2	U15	/	WM

3. DESCRIPTION

A. A56 transponder

A56 transponder transmits a coded response to an interrogation transmitted by an air traffic control ground radar station. The coded response contains the aircraft identification code and altitude information.

A56 transponder is a rectangular box installed in a rack. Connections are made through an electrical connector and an antenna connector on the back panel.

The front face of A56 transponder features :

- a display that shows data such as identification code, operating mode and, depending on the selection, flight level, flight time or time measure function.
- a set of pushbuttons for equipment energization and selection of the different operating modes :
 - . "OFF" pushbutton : The transponder is de-energized.
 - . "STBY" pushbutton : A56 transponder is energized but is inhibited from replying to any ground interrogation.

- . "ON" pushbutton : During normal operation, the transponder retransmits the identification code in the display window to ground interrogations.
- . "ALT" pushbutton : The transponder retransmits the identification code and the flight level (mode C) to ground interrogations.
- an "IDENT" pushbutton used to transmit a special identification pulse to help the radar operator.
- a "VFR" pushbutton used to recall a pre-programmed identification code into the transponder memory.
- eight pushbuttons identified from "0" to "7" are provided either to separately select each of the four digits of the identification code or to enter figures from 0 to 7 to program the time measure function in counting-down mode.
- a "FUNC" pushbutton used to modify the modes displayed on the R.H. section of the display. Main displayed data are flight level, flight time and time measure function (up-down counter).
- a "START/STOP" pushbutton used to start or stop the up-down counter of time measure function.
- a "CRSR" pushbutton used to activate/de-activate the cursor in order to select starting time of time measure function in counting-down mode. It is also used to cancel the current selection of the identification code.
- a "CLR" pushbutton is used to reset the up-down counter of the time measure function. It is also used during identification code selection to cancel the latest activation of one of the pushbuttons and return to the code that was valid before the pushbutton was activated.
- "8" and "9" pushbuttons are provided either to adjust the display contrast and brightness (configuration mode) or to enter 8 and 9 figures to select the starting time of time measure function in counting-down mode.

A56 transponder receives a coded interrogation transmitted by the air traffic control ground radar station on a 1030-MHz carrier. A56 transponder decodes and processes the interrogations and sends a coded response on a 1090-MHz carrier.

A56 transponder is electrically supplied by "BUS 1" and/or "BUS 2" bars via a diode and a fuse respectively. The transponder is protected by CB 90 "XPDR" circuit breaker.

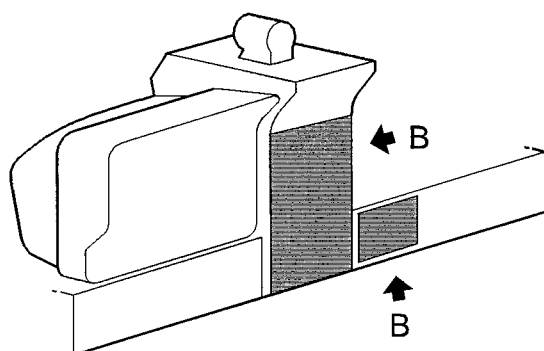
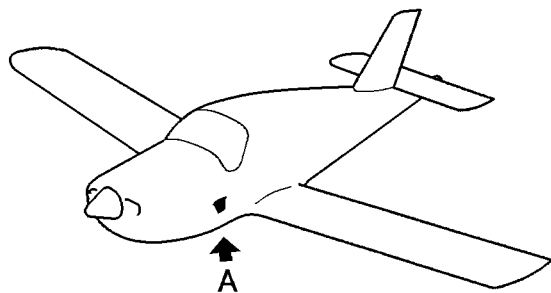
A56 transponder is mounted on radio rack or, in variant on R.H. panel strip.

B. E36 transponder antenna

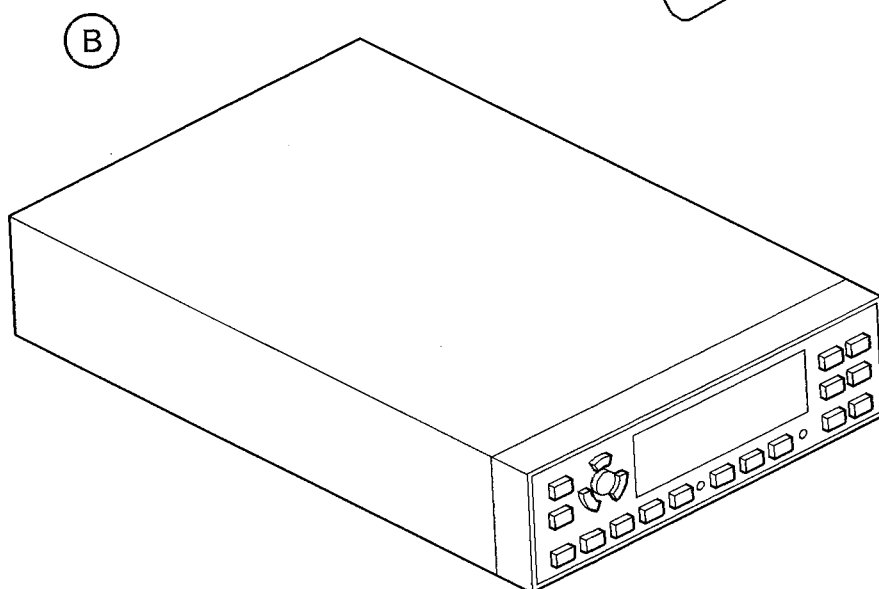
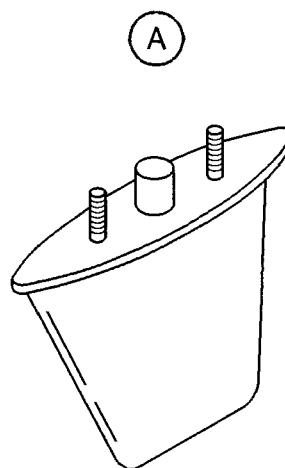
The transponder antenna allows signal reception and transmission within the L band (frequency within 950 and 1260 MHz).

The transponder antenna is mounted under the fuselage on the cowling under hull.

- A - E36 transponder antenna
- B - A56 transponder



 Variante de localisation
Alternate location



Transponder – Identification and location of components
Figure 1

I4345300AAADVZ14101

4. OPERATION (Figure 2)

A56 transponder energization is obtained by means of "RADIO MASTER" switch.

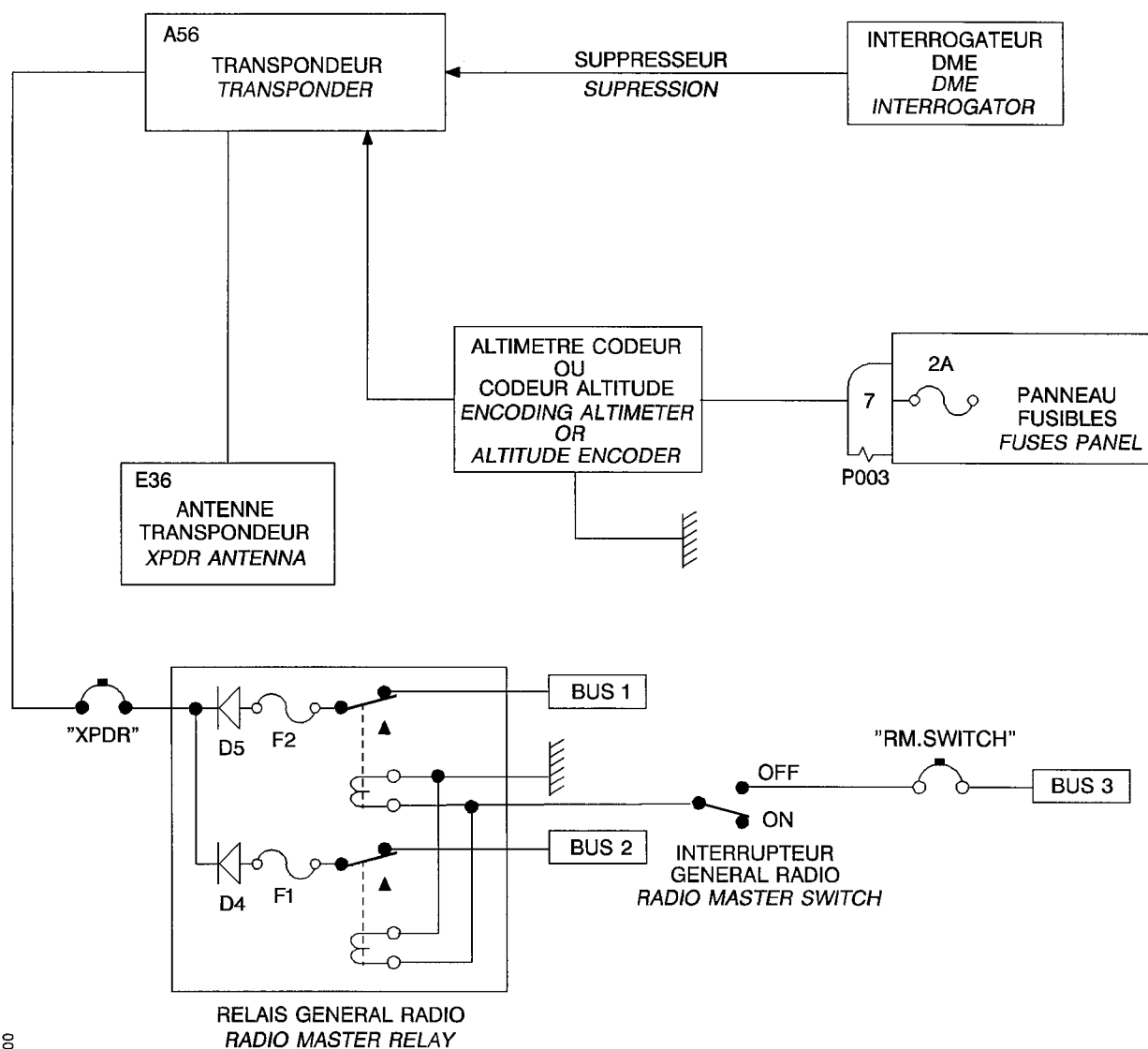
When the pushbutton is set to "ON", the transponder is energized and replies to mode "A" identification interrogations. The identification code, entered into the transponder by means of the code selection pushbuttons (pushbuttons from "0" to "7"), is transmitted to the ground station.

When "VFR" pushbutton is pressed, the identification code shown on the central section of the display is replaced by the programmed VFR code.

When A56 transponder is operating in mode "C" ("ALT" pushbutton), the altitude data provided by M76 encoding altimeter are transmitted to the ground station. A56 transponder, with "FUNC" pushbutton used to select the display of flight level data, shows a flight level "FL" in hundreds of feet on the right section of its display. The displayed altitude is not the true altitude but the pressure altitude not corrected by the local pressure (reference pressure 29.92 in.Hg, that is 1013.25 hPa).

For example : if the display reads FL 075, the transmitted altitude is 7500 ft.

A56 transponder indicates the selected mode ("ALT", "ON" or "STBY") on the left section of its display.



14345300AAACWZ24100

A56 transponder – Schematic
Figure 2

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TRANSPONDER

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1 and 1A)

The transponder allows the operational air traffic service to identify the aircraft.

The optional system consists of :

- an A56 transponder,
- an E36 antenna.

The transponder can receive altitude information from the optional encoding altimeter or altitude encoder – refer to 34-11-00.

A desensitization line connects the transponder to the optional DME installation – refer to 34-55-00.

If the transponder is mounted into the radio rack, the blower of the radio air cooling system blows air through a duct to the rear of the transponder.

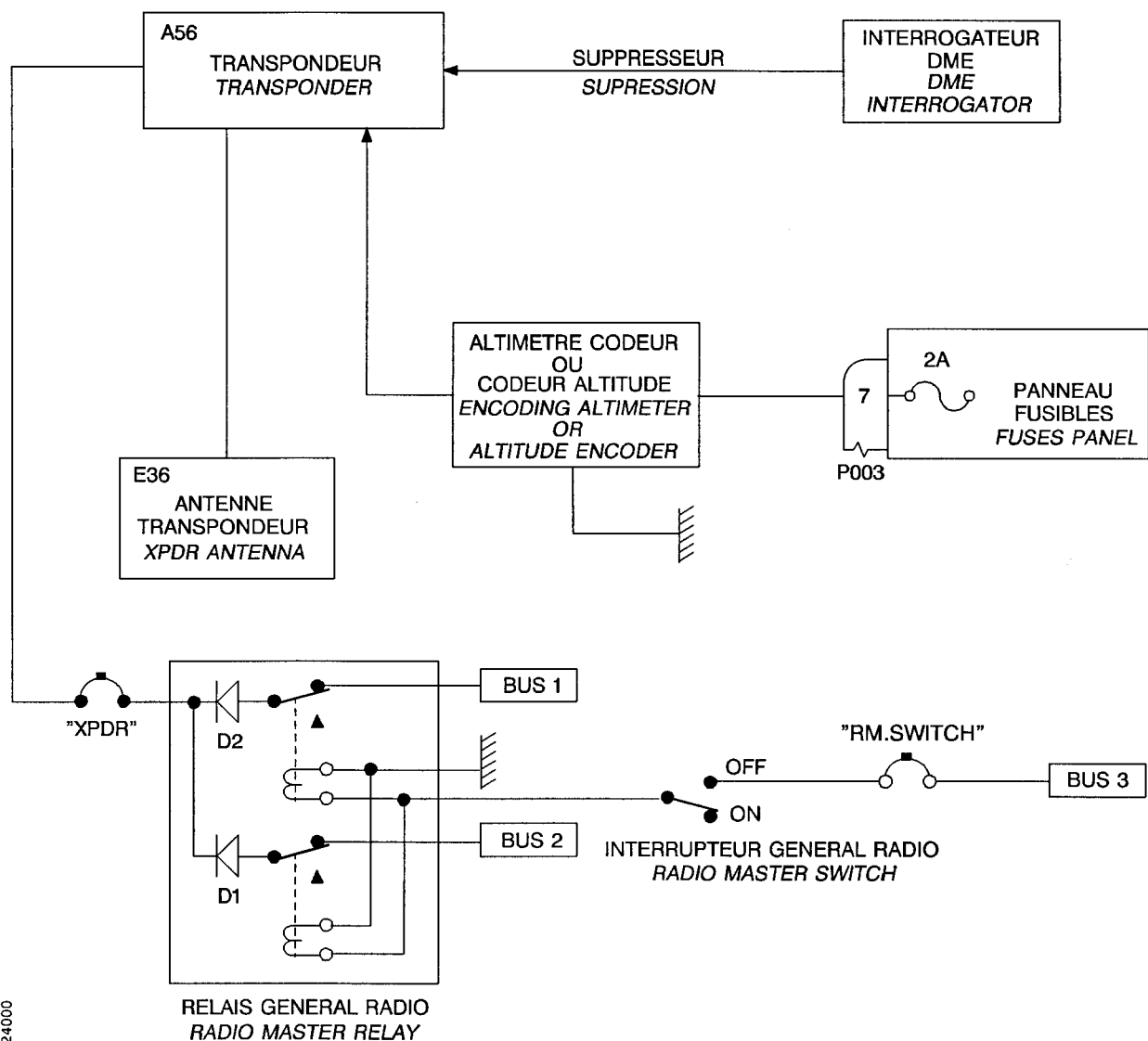
The transponder is electrically supplied by "BUS 1" and / or "BUS 2" bar(s) via the "XPDR" circuit breaker.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A56 transponder	1	250	/	34-50-00
E36 antenna	1	210	215	34-53-03
Circuit breaker : - "XPDR"	1	230	232L	WM

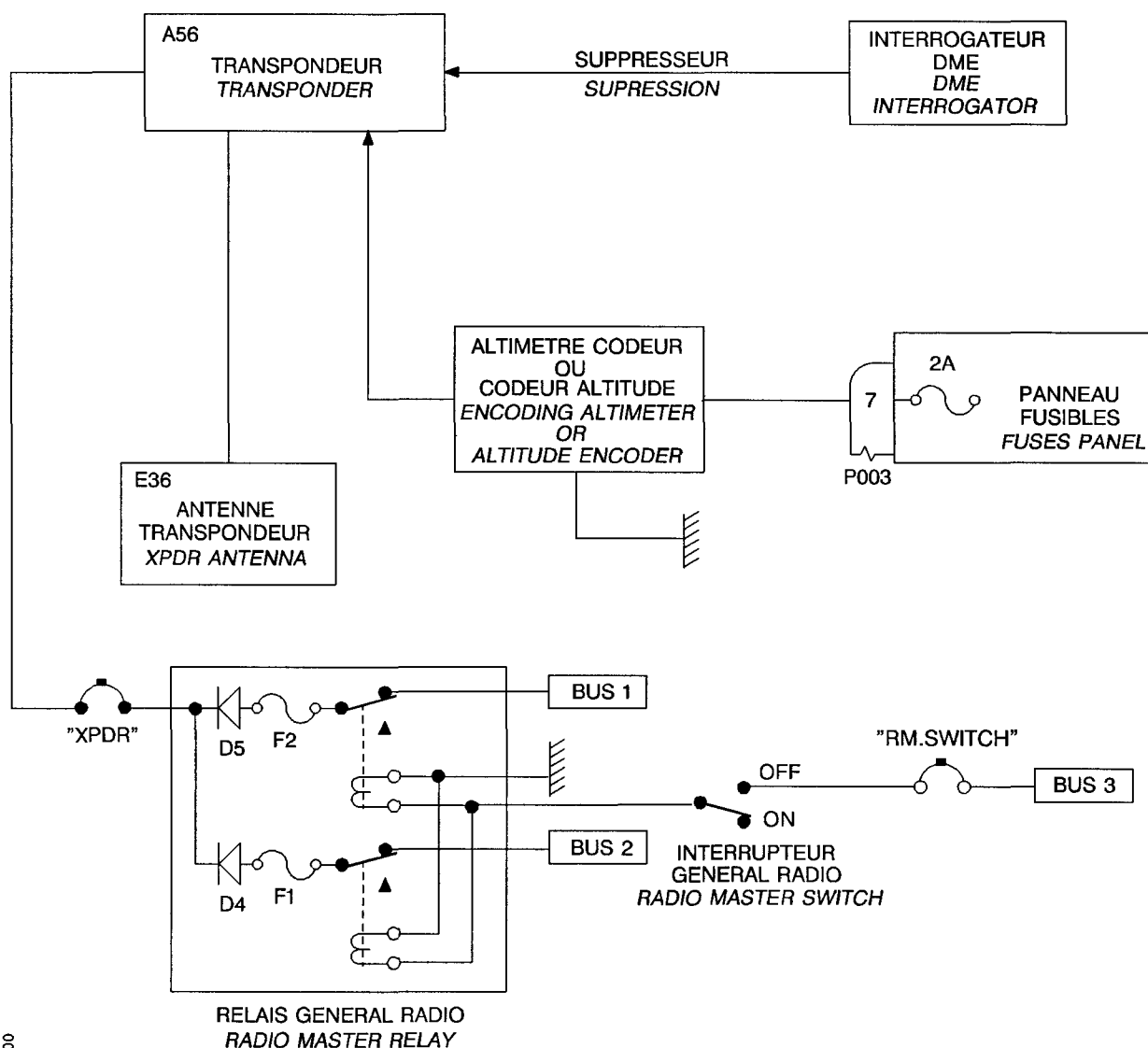
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



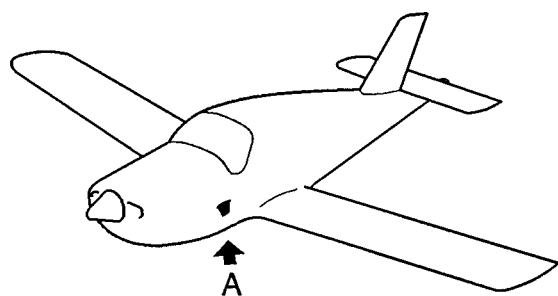
14345300AAACWZ24000

Transponder - Electrical schematic
Figure 1 - Without fuses on radio master switch circuit board

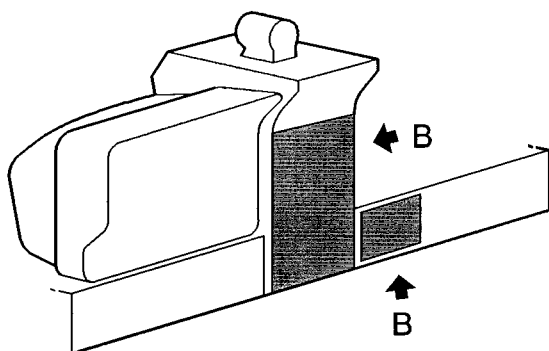


14345300AAACWZ24100

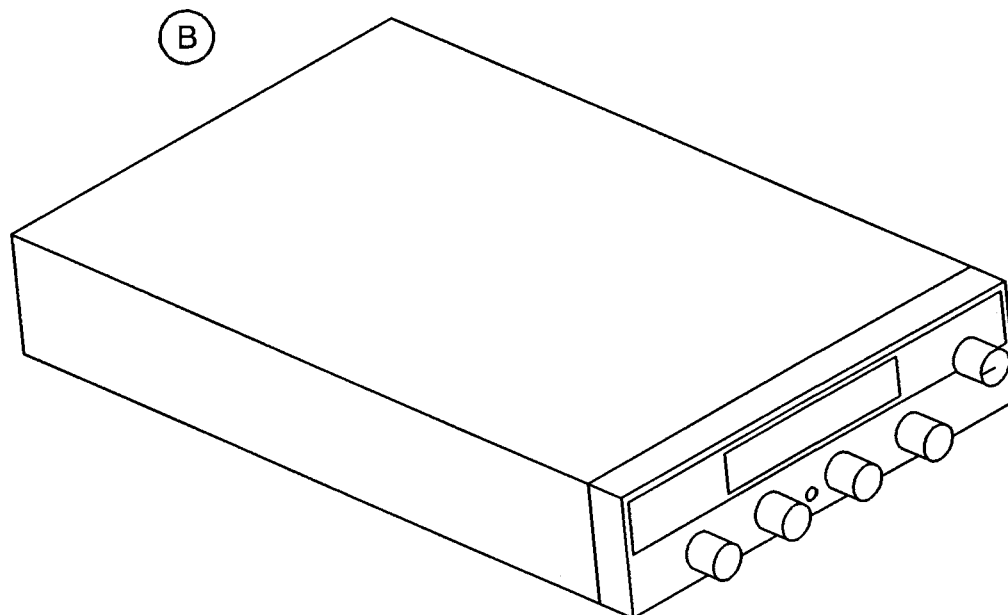
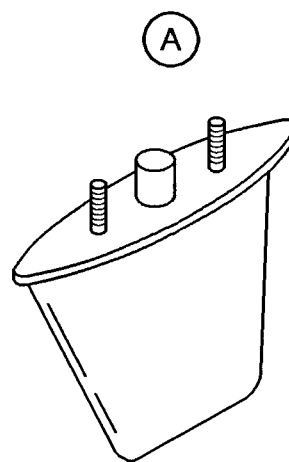
Transponder - Electrical schematic
Figure 1A - With fuses on radio master switch circuit board



- A - E36 antenna
- B - A56 transponder



 Variante de localisation
Alternate location



Transponder - Identification and location of components
Figure 2

14345300AAADVZ4001

TRANSPONDER

DESCRIPTION AND OPERATION

1. GENERAL

The transponder is an integral part of the Air Traffic Control Radar Beacon System (ATCRBS).

The transponder allows the operational air traffic service to identify the aircraft.

The system consists of :

- the A56 transponder,
- the E36 transponder antenna.

The transponder receives altitude information from the encoding altimeter - refer to 34-11-00.

It sends an altitude audio warning signal to A50 audio control box via a R88 attenuation resistor - refer to 23-11-00.

The transponder receives and sends information to global positioning system (GNS-series GARMIN) - refer to 34-57-00.

A desensitization line connects A56 transponder to the DME installation - refer to 34-55-00.

The transponder is electrically supplied by "BUS 1" and/or "BUS 2" bars.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A56 transponder	1	254R	/	34-50-00
E36 transponder antenna	1	210	215	34-53-03
Circuit breaker : - CB 90 "XPDR"	1	PL1	/	WM
Fuses : - F1 and F2	2	U15	/	WM

3. DESCRIPTION

A. A56 transponder

A56 transponder transmits a coded response to an interrogation transmitted by an air traffic control ground radar station. The coded response contains the aircraft identification code (mode A) and altitude information (mode C). The transponder also transmits a response to general calls (All Call) of mode S.

A56 transponder is a rectangular box installed in a rack. Connections are made through an electrical connector and an antenna connector on the back panel.

The front face of A56 transponder features :

- a display that shows data such as identification code, operating mode and, depending on the selection, flight level, flight time or time measure function.
- a set of pushbuttons for equipment energization and selection of the different operating modes :
 - . "OFF" pushbutton : The transponder is de-energized.
 - . "STBY" pushbutton : A56 transponder is energized but is inhibited from replying to any ground interrogation.
 - . "ON" pushbutton : Used to select modes A and S. The transponder replies to interrogations of modes A, C and S but the response does not contain altitude information.
 - . "ALT" pushbutton : Used to select modes A, C and S. The transponder replies to interrogations of identification (mode A), altitude (mode C) and mode S.
- an "IDENT" pushbutton used to transmit a special identification pulse to help the radar operator.
- a "VFR" pushbutton used to recall a pre-programmed identification code into the transponder memory.
- eight pushbuttons identified from "0" to "7" are provided either to separately select each of the four digits of the identification code or to enter figures from 0 to 7 to program the time measure function in counting-down mode.
- a "FUNC" pushbutton used to modify the modes displayed on the R.H. section of the display. Main displayed data are flight level, flight time and time measure function (up-down counter).
- a "START/STOP" pushbutton used to start or stop the up-down counter of time measure function.
- a "CRSR" pushbutton used to activate/de-activate the cursor in order to select starting time of time measure function in counting-down mode. It is also used to cancel the current selection of the identification code.
- a "CLR" pushbutton is used to reset the up-down counter of the time measure function. It is also used during identification code selection to cancel the latest activation of one of the pushbuttons and return to the code that was valid before the pushbutton was activated.
- "8" and "9" pushbuttons are provided either to adjust the display contrast and brightness (configuration mode) or to enter 8 and 9 figures to select the starting time of time measure function in counting-down mode.

A56 transponder receives a coded interrogation transmitted by the air traffic control ground radar station on a 1030-MHz carrier. A56 transponder decodes and processes the interrogations and sends a coded response on a 1090-MHz carrier.

A56 transponder is electrically supplied by "BUS 1" and/or "BUS 2" bars via a diode and a fuse respectively. The transponder is protected by CB 90 "XPDR" circuit breaker.

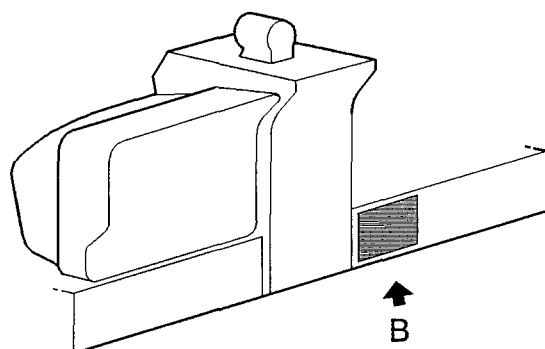
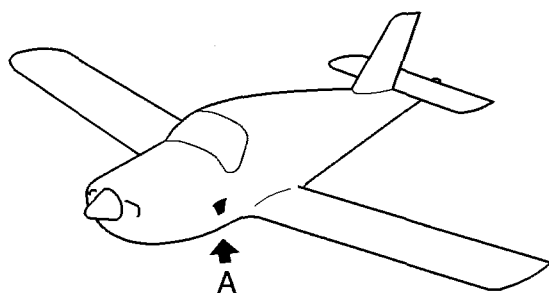
A56 transponder is mounted on R.H. panel strip.

B. E36 transponder antenna

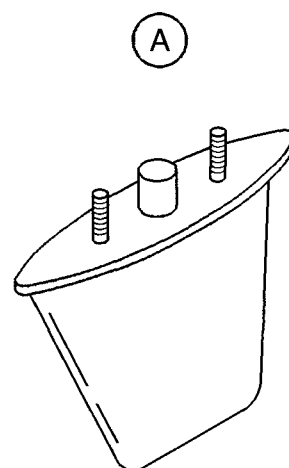
The transponder antenna allows signal reception and transmission within the L band (frequency within 950 to 1260 MHz).

The transponder antenna is mounted under the fuselage on the cowling under hull.

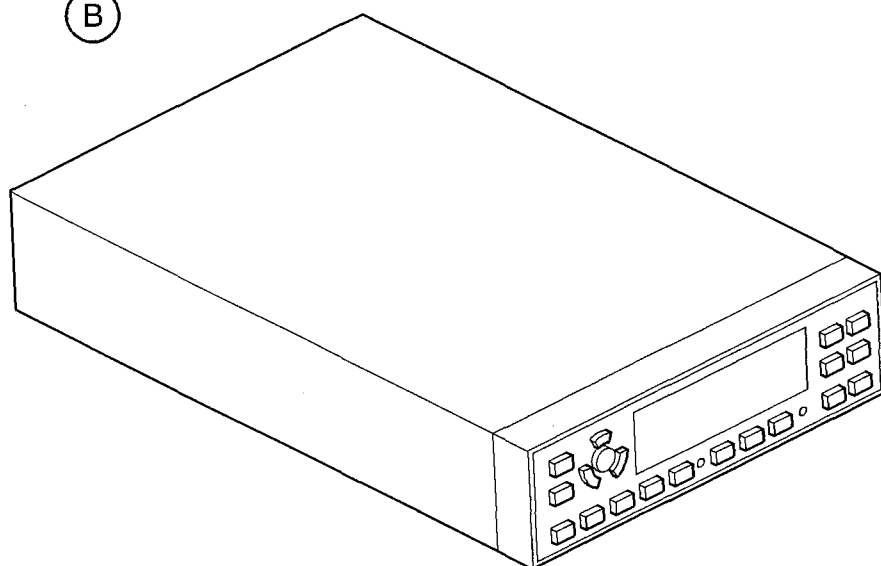
- A - E36 transponder antenna
- B - A56 transponder



 Variante de localisation
Alternate location



(B)



Transponder – Identification and location of components
Figure 1

I4345300AAADVZ14200

4. OPERATION (Figure 2)

A56 transponder energization is obtained by means of "RADIO MASTER" switch.

Connecting the transponder to the global positioning system via an ARINC 429 link allows the aircraft to be detected on the ground.

During flight, A56 transponder receives interrogations from ground radar station or TCASs at 1030-Mhz frequency.

The transponder replies to mode "A" interrogations by transmitting to the ground station the identification code, entered into the transponder by means of the code selection pushbuttons (pushbuttons from "0" to "7").

When "VFR" pushbutton is pressed, the identification code shown on the central section of the display is replaced by the programmed VFR code.

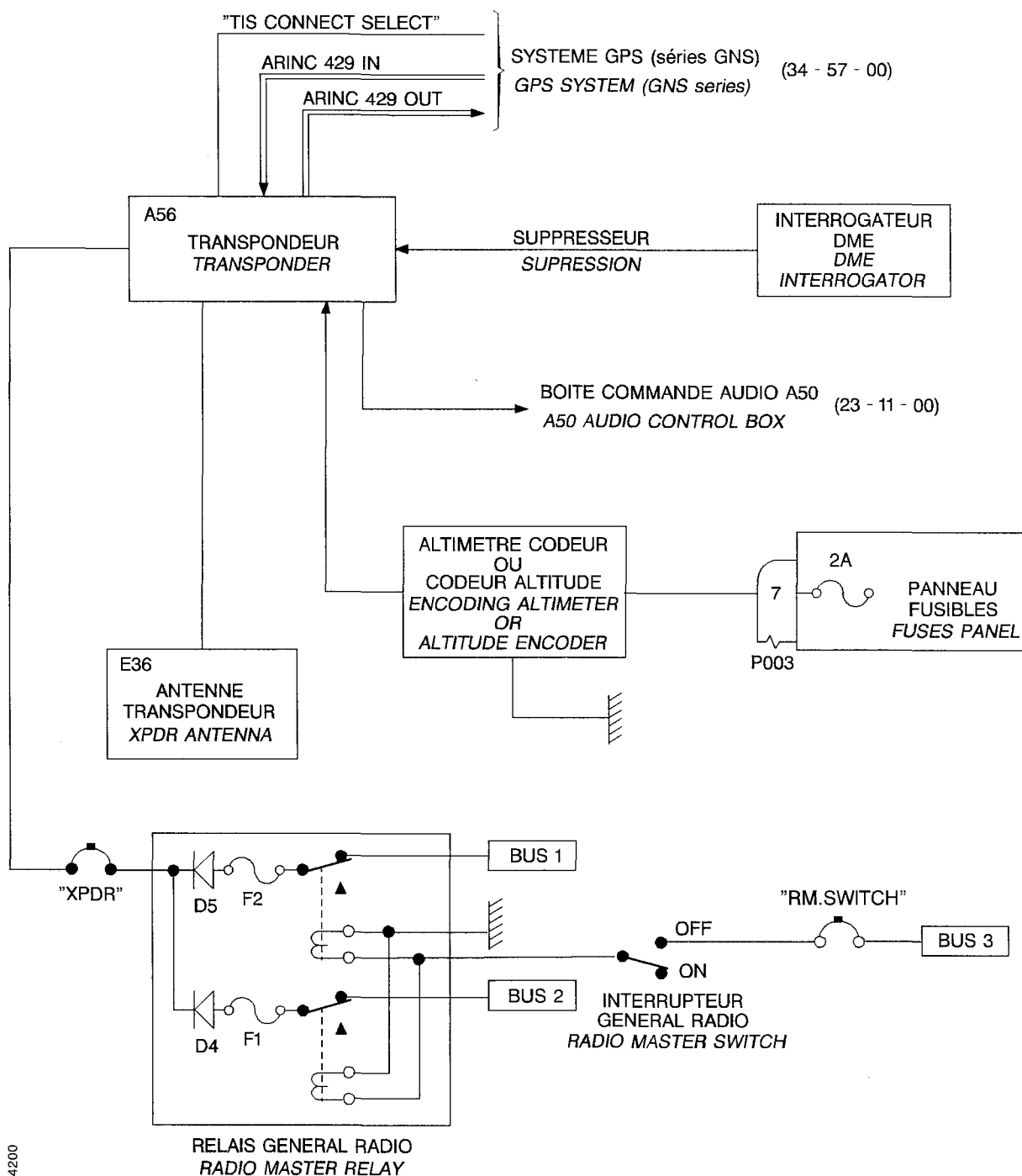
The transponder replies to mode "C" interrogations by transmitting the identification code and altitude information.

When A56 transponder is operating in mode "C" ("ALT" pushbutton), the altitude data provided by M76 encoding altimeter are transmitted to the ground station. A56 transponder, with "FUNC" pushbutton used to select the display of flight level data, shows a flight level "FL" in hundreds of feet on the right section of its display. The displayed altitude is not the true altitude but the pressure altitude not corrected by the local pressure (reference pressure 29.92 in.Hg, that is 1013.25 hPa).

For example : if the display reads FL 075, the transmitted altitude is 7500 ft.

A56 transponder indicates the selected mode ("ALT", "ON" or "STBY") on the left section of its display.

In mode "S", the transponder can reply to a single-direction interrogation sent by a ground radar station or another aircraft.



14345300AAA CWZ24200

Transponder – Schematic
Figure 2

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TRANSPONDER

ADJUSTMENT / TEST

1. CONFIGURATION OF THE TRANSPONDER

A. Tools and consumable materials

- Ground power unit

B. Procedure

For transponder configuration, refer to "GARMIN GTX 327 INSTALLATION MANUAL", Part number 190-00187-02 at the latest revision.

The following tables define the parameters programmed in the equipment at aircraft delivery depending on the installed option.

"DISPLAY MODE" Page	
DISPLAY MODE	AUTO
LEVEL	75

"DISPLAY BACKLIGHT" Page	
BKLT (Backlight)	AUTO
LVL (Level)	XXXXXXXX
RSP TIME (response time)	4
MIN	80
BKLT SRCE (Backlight source)	PHOTO
SLOPE	50
OFFSET	50

"KEY LIGHTING" Page	
KEY	AUTO
LVL (Level)	XXXXXX
RSP TIME (response time)	4
MIN	80
KEY SRCE (Key source)	28
SLOPE	50
OFFSET	50

"CONTRAST MODE" Page	
CONTRAST MODE	AUTO

Configuration – OPT10-34-504-A (SOFTWARE 2.02)
Table 501 (1/2)

"SETUP 1" Page	
VS RATE (Vertical speed rate)	500
ALT SRC (Altitude source)	GRAY CODE
VFR ID (VFR Transponder code)	7000 (EUROPE) / 1200 (USA)
FORMAT (Altitude format)	FLIGHT LEVEL

"SETUP 2" Page	
AIRBORNE SOURCE	GPS
SENSE	LOW
AUTO STANDBY ?	ON
DELAY TIME	24

Configuration – OPT10-34-504-A (SOFTWARE 2.02)
Table 501 (2/2)

"DISPLAY MODE" Page	
DISPLAY MODE	AUTO
LEVEL	75

"DISPLAY BACKLIGHT" Page	
BKLT (Backlight)	AUTO
LVL (Level)	XXXXXXXXXX
RSP TIME (response time)	4
MIN	80
BKLT SRCE (Backlight source)	PHOTO
SLOPE	50
OFFSET	50

"KEY LIGHTING" Page	
KEY	AUTO
LVL (Level)	XXXXXX
RSP TIME (response time)	4
MIN	80
KEY SRCE (Key source)	28
SLOPE	50
OFFSET	50

Configuration – OPT10-34-504-A (SOFTWARE 2.04)
Table 502 (1/2)

"CONTRAST MODE" Page	
CONTRAST MODE	AUTO

"RS-232 INPUT/OUTPUT" Page	
RS 232	INPUT
CHNL1	OFF
CHNL2	GPS
RS 232	OUTPUT
	OFF

"CONFIGURATION" Page 1	
VS RATE (Vertical speed rate)	500
FLT TMR	MANUAL
VFR ID (VFR Transponder code)	7000 (EUROPE) / 1200 (USA)
FORMAT (Altitude format)	FLIGHT LVL

"CONFIGURATION" Page 2	
SQUAT SWITCH ?	NO
SENSE	LOW
AUTO STANDBY ?	ON
DELAY TIME	24

"AIRCRAFT TYPE" Page	
AC TYPE < 15.5 K	

Configuration – OPT10-34-504-A (SOFTWARE 2.04)
Table 502 (2/2)

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TRANSPONDER

ADJUSTMENT / TEST

1. CONFIGURATION OF THE TRANSPONDER

A. Tools and consumable materials

- Ground power unit

B. Procedure

For transponder configuration, refer to GARMIN "GTX 330, GTX 330D TRANSPONDER INSTALLATION MANUAL", Part number 190-00207-02 at the latest revision.

The following tables define the parameters programmed in the equipment at aircraft delivery depending on the installed option.

"AUDIO MODE" Page 1	
AUDIO VOLUME	50%
VOICE FEMALE	
MESSAGE 1	

"AUDIO MODE" Page 2		
	AUDIO	PAGE CHANGE
ALTITUDE MONITOR	OFF	DISABLE
COUNT DOWN TIMER	OFF	

"TRAFFIC INFORMATION" Page	
TRAFFIC MESSAGES MESSAGE	

"DISPLAY MODE" Page	
DISPLAY MODE	AUTO
LEVEL	75

"DISPLAY BACKLIGHT" Page	
BKLT (Backlight)	AUTO
LVL (Level)	XXX
RSP TIME (Response time)	4
MIN	80
BKLT SRCE (Backlight source)	PHOTO
SLOPE	50
OFFSET	50

Configuration - OPT10-34-505-A
Table 501 (1/3)

"KEY LIGHTING" Page	
KEY	AUTO
LVL (Level)	XXX
RSP TIME (Response time)	4
MIN	80
KEY SRCE (Key source)	28
SLOPE	50
OFFSET	50

"CONTRAST MODE" Page	
CONTRAST MODE	AUTO - 50%

"ARINC 429 CONFIGURATION" Page 1		
429 INPUT	SPEED	DATA
CHANNEL 1	LOW	GPS
CHANNEL 2	LOW	OFF

"ARINC 429 CONFIGURATION" Page 2		
429 INPUT	SPEED	DATA
CHANNEL 3	LOW	OFF
CHANNEL 4		OFF

"ARINC 429 OUTPUT" Page	
429 OUTPUT	DATA
CHANNEL 1	OFF
CHANNEL 2	OFF

"RS 232 INPUT AND OUTPUT" Page		
RS 232	INPUT	OUTPUT
CHANNEL 1	OFF	OFF
CHANNEL 2	OFF	OFF

Configuration - OPT10-34-505-A
Table 501 (2/3)

"OPERATION CONFIGURATION" Page 1	
VS RATE	500
FORMAT	FLIGHT LVL
VFR ID	DEPEND ON CUSTOMER AREA 7000 (EUROPE) / 1200 (USA)
ALT ALRT DEV	200

"OPERATION CONFIGURATION" Page 2	
SQUAT SWITCH ?	NO
SENSE	LOW
DELAY TIME	24
AUTO FLT TMR ?	MAN

"TEMPERATURE" Page	
TEMPERATURE	
SENSOR INSTALLED	NO

"MODE S Address Entry" Page (A/C Reg.)	
AIRCRAFT ADDRESS TO "US REGISTRATION" OR "HEX CODE" FORMAT	
ADDRESS US TAIL #	XXXXXX
ABC DEF GHI.....	XXXXXX

"MODE S Address Entry" Page (flight ID)	
POWER UP ENTRY	

"MODE S Aircraft Type" Page	
AC TYPE <15.5K	MAX A/S <= 150KT (TB9/TB10/TB200), 300KT (TB20/TB21)

Configuration - OPT10-34-505-A
Table 501 (3/3)

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E36 TRANSPONDER ANTENNA

MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - E36 TRANSPONDER ANTENNA (Figures 201 and 201A)

A. Tools and consumable materials

- Sealant (TB 09-903)
- Sealant (TB 08-004B)
- Plastic scraper
- Clean lintfree cloths
- Cleaning agent (TB 11-912)
- Alodine (TB 13-002)
- Varnish (TB 07-906)
- Abrasive cloth (TB 05-916C)
- Adhesive tape
- Varnish (TB 07-907)

B. Removal of the transponder antenna

- 1) Make sure that the main switch-breaker is open.
- 2) If a sealant bead is applied around antenna (4), remove the sealant with a plastic scraper.
- 3) Remove screws (6) and washers (7).
- 4) Hold antenna (4) and disconnect connector (11). Remove inspection door (3).
- 5) Remove nuts (1), washers (2) and lockwashers (14) if installed. Discard the nuts.

Antenna installed with conductive sealant

- 6) Carefully unstick and remove antenna (4).
- 7) Using a plastic scraper, remove any sealant residues on inspection door (3) and antenna (4), if necessary.

Antenna installed without conductive sealant

- 6) Remove antenna (4) and discard gasket (5) if installed.

C. Installation of the transponder antenna

Antenna on inspection door with counterplate

- 1) Clean the external face of inspection door (3) with a clean lintfree cloth moistened with cleaning agent (TB 11-912).
- 2) Secure antenna with new nuts (1), washers (2) and lockwashers (14) if installed.

- 3) Apply a bead (13) of sealant (TB 08-004B) around antenna connector.

Antenna on inspection door without counterplate

- 1) If inspection door (3) area in contact with the base of antenna (4) is not a alodine-coated area, perform the following operations
 - a) Position the antenna on inspection door (3) and draw the contour of the antenna with a soft-lead pencil.
 - b) Using adhesive tape, delimit the area of inspection door (3) around the contour of antenna (4).
 - c) Using abrasive cloth (TB 05-916C), bare the area in contact with the antenna base on inspection door (3).
 - d) Clean the bared area with a clean lintfree cloth moistened with cleaning agent (TB 11-912). Wipe with a dry cloth.
 - e) Protect the bared area with Alodine (TB 13-002).
 - f) Remove the adhesive tape.
- 2) Clean the door area in contact with the antenna base with a clean lintfree cloth moistened with cleaning agent (TB 11-912). Wipe with a dry cloth.
- 3) Ensure the bonding of areas (9) in contact with washers (2) - refer to 20-00-12.
- 4) Secure the antenna with new nuts (1) and washers (2).
- 5) Clean the alodine-coated areas still visible with a clean lintfree cloth moistened with cleaning agent (TB 11-912). Wipe with a dry cloth.
- 6) Apply varnish (TB 07-906) on securing hardware and on alodine-coated areas still visible.

Aircraft with nylon washers (7)

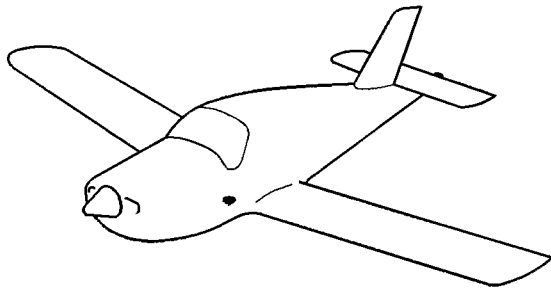
- 7) Prepare areas to be bonded (8), to a diameter of 0.5 in (13 mm), for all the points of inspection door (3) attachment (internal area) - refer to 20-00-12.
- 8) Ensure the bonding of the facing contact surfaces on structure (10) - refer to 20-00-12.
- 9) Connect connector (11).
- 10) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 11) Secure inspection door (3) with screws (6) and washers (7).

Aircraft with metal washers (7)

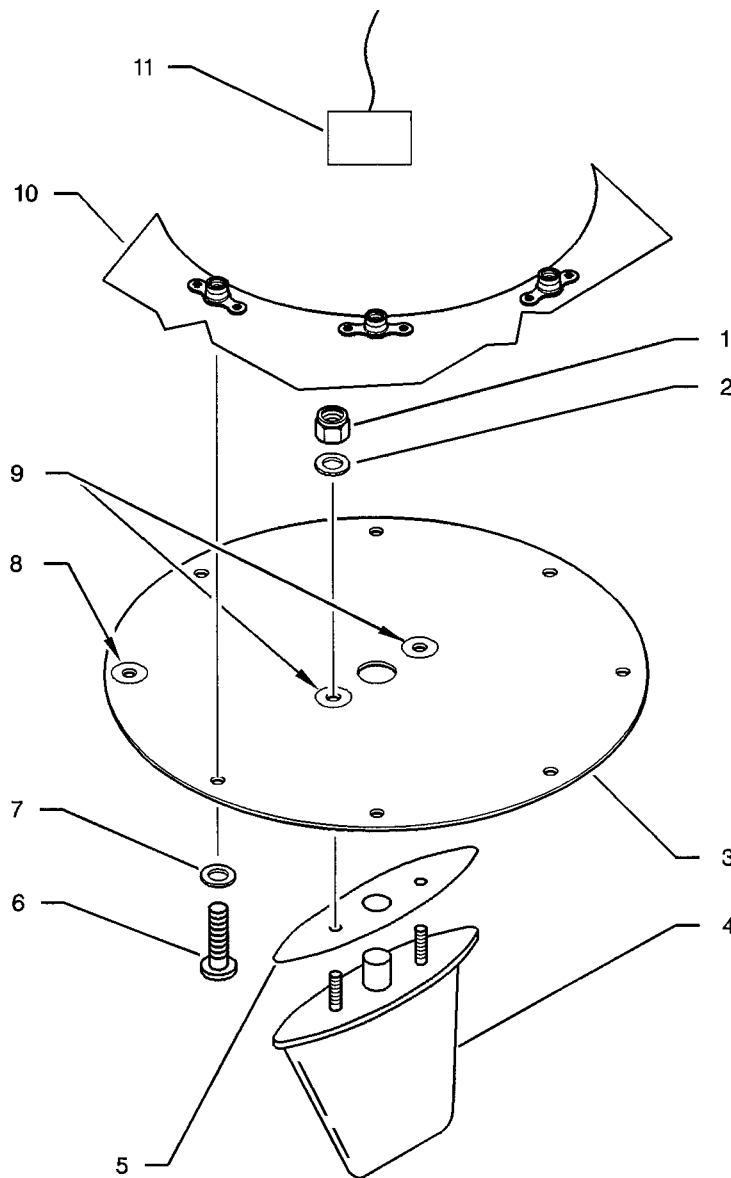
- 7) On inspection door (3) clean up the existing bonding points under washers (7) - refer to 20-00-12.
- 8) Connect connector (11).
- 9) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 10) Secure inspection door (3) with screws (6) and washers (7).
- 11) Carefully clean excess petrolatum with a clean cloth slightly moistened with cleaning agent (TB 11-912). Wipe with a dry cloth.
- 12) Protect the heads of screws (6) and the alodine-coated areas still visible with a coat of varnish (TB 07-907).

All

- 13) Apply a bead of sealant (TB 09-903) around the antenna. Smooth-finish the bead.
- 14) Perform a functional test of the system.

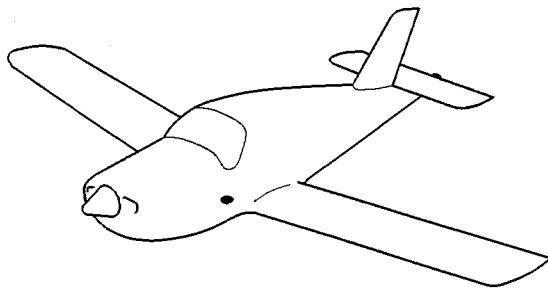


- 1 - Nut
- 2 - Washer
- 3 - Inspection door
- 4 - Antenna
- 5 - Gasket
- 6 - Screw
- 7 - Washer
- 8 - Area to be bonded
- 9 - Area to be bonded
- 10 - Structure
- 11 - Connector

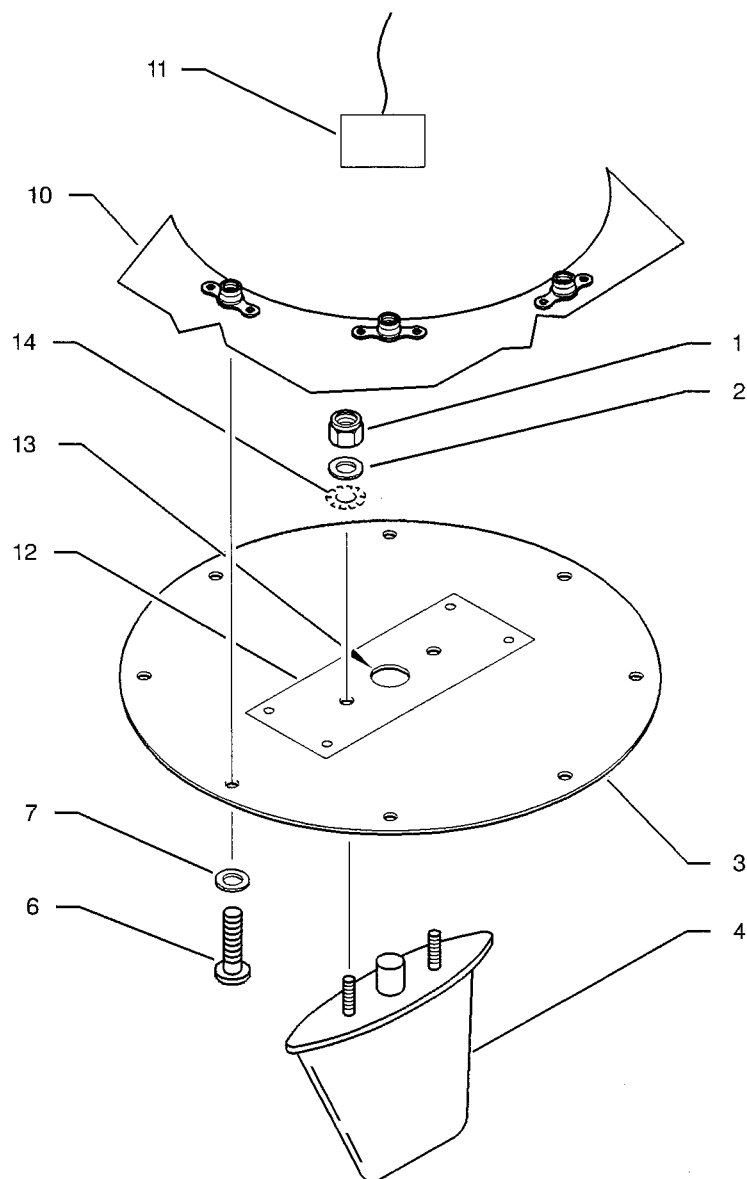


E36 transponder antenna - Removal / Installation
Figure 201 - Inspection door without counterplate

I4345000AABNVZ4000



- 1 - Nut
- 2 - Washer
- 3 - Inspection door
- 4 - Antenna
- 6 - Screw
- 7 - Washer
- 10 - Structure
- 11 - Connector
- 12 - Counterplate
- 13 - Sealant bead
- 14 - Lockwasher



E36 transponder antenna - Removal/Installation
Figure 201A - Inspection door with counterplate

14345000AABNVZ14001

AAAA
Validity : OPTION

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AUTOMATIC DIRECTION FINDER (ADF)

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1, 1A and 1B)

The Automatic Direction Finder (ADF) is a direction-finding device which allows to determine the direction of a radioelectric transmission.

The optional ADF installation gives azimuth indications which allow to point a position and to do alignments.

The ADF installation consists of :

- an A55 ADF receiver,
- an E35 ADF antenna.

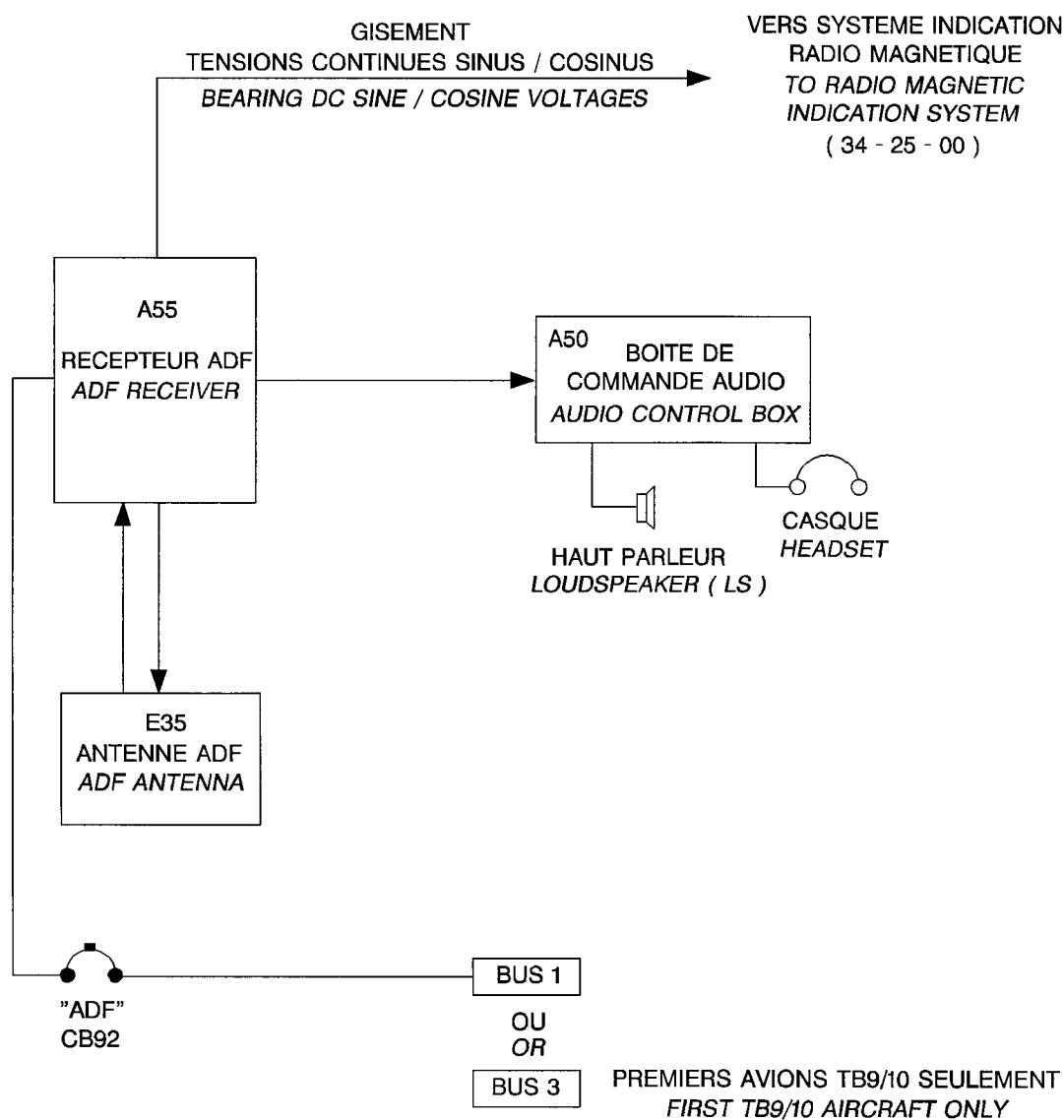
The ADF installation sends ADF data to the radio magnetic indication system - refer to 34-25-00.

The ADF installation sends an audio signal to the optional A50 audio control box - refer to 23-11-00.

The system is electrically supplied by "BUS 1" or "BUS 2" or "BUS 3" bars.

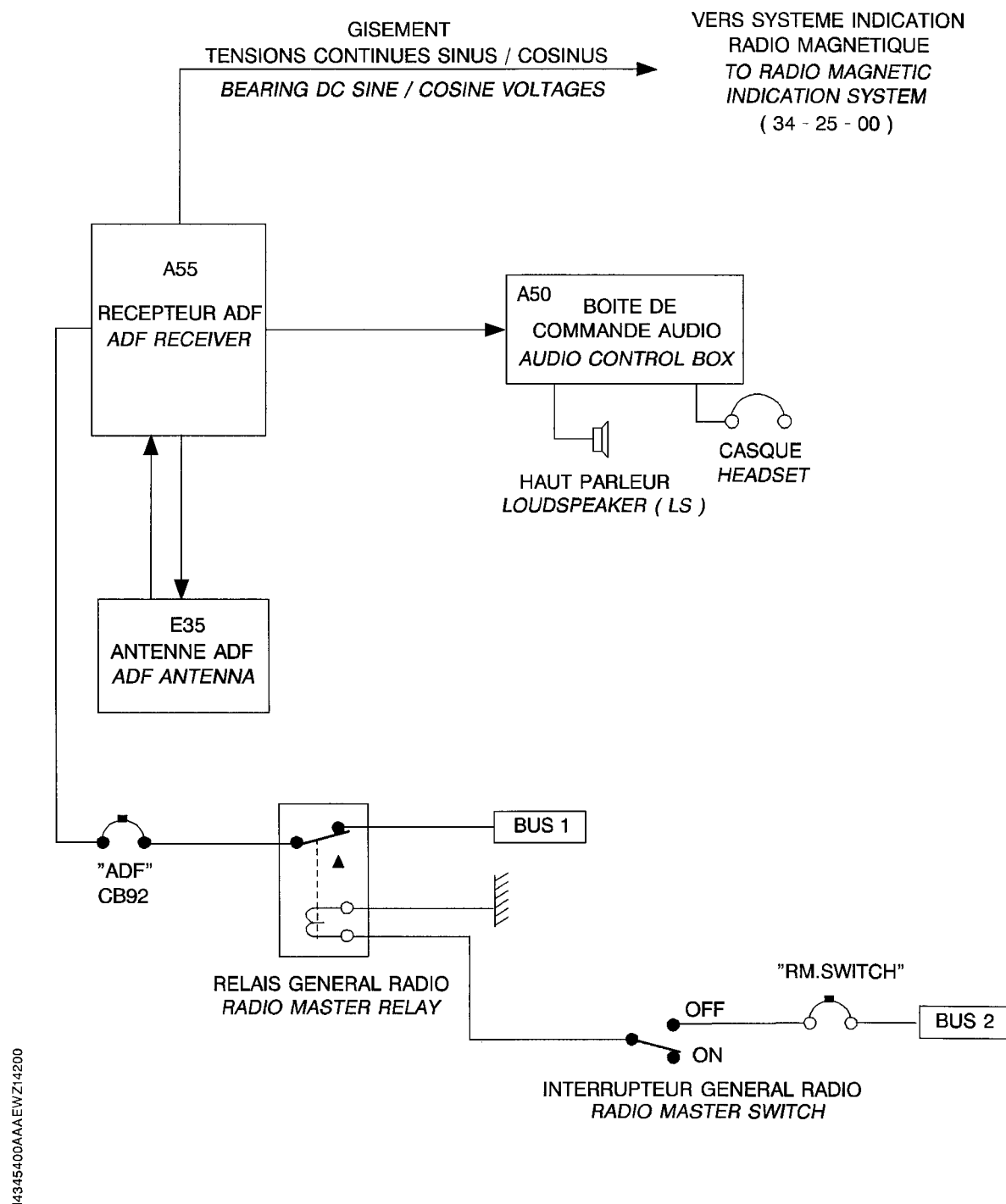
2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A55 ADF receiver	1	251C or 254R	/	34-50-00
E35 ADF antenna	1	220	242	34-54-05
Circuit breaker : - CB92 "ADF"	1	230	232L	WM



I4345400AAAEWZ14100

Automatic Direction Finder (ADF) - Electrical schematic
Figure 1 - 14 volts without radio master



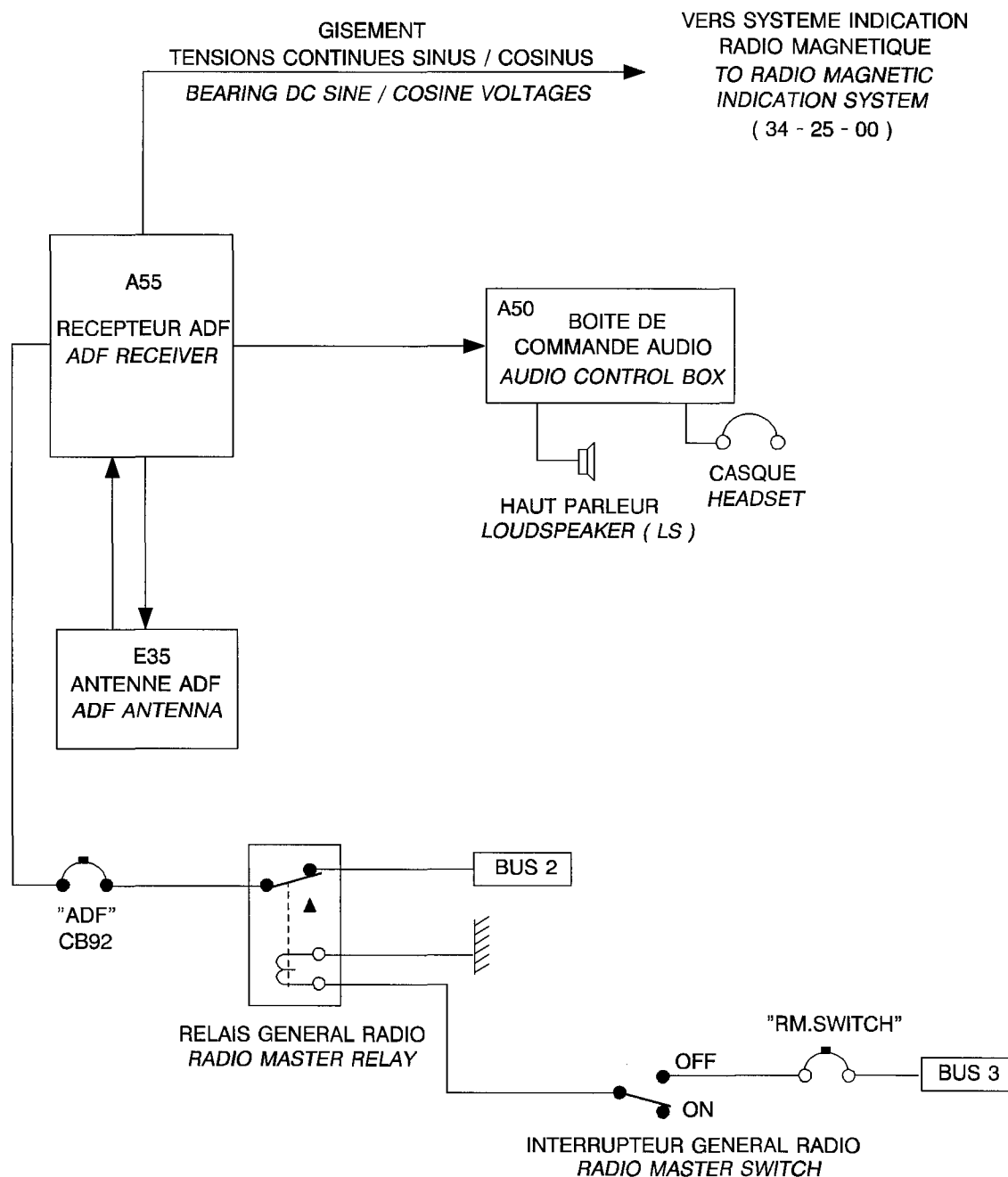
Automatic Direction Finder (ADF) - Electrical schematic
Figure 1A - 14 volts with radio master

AFAF

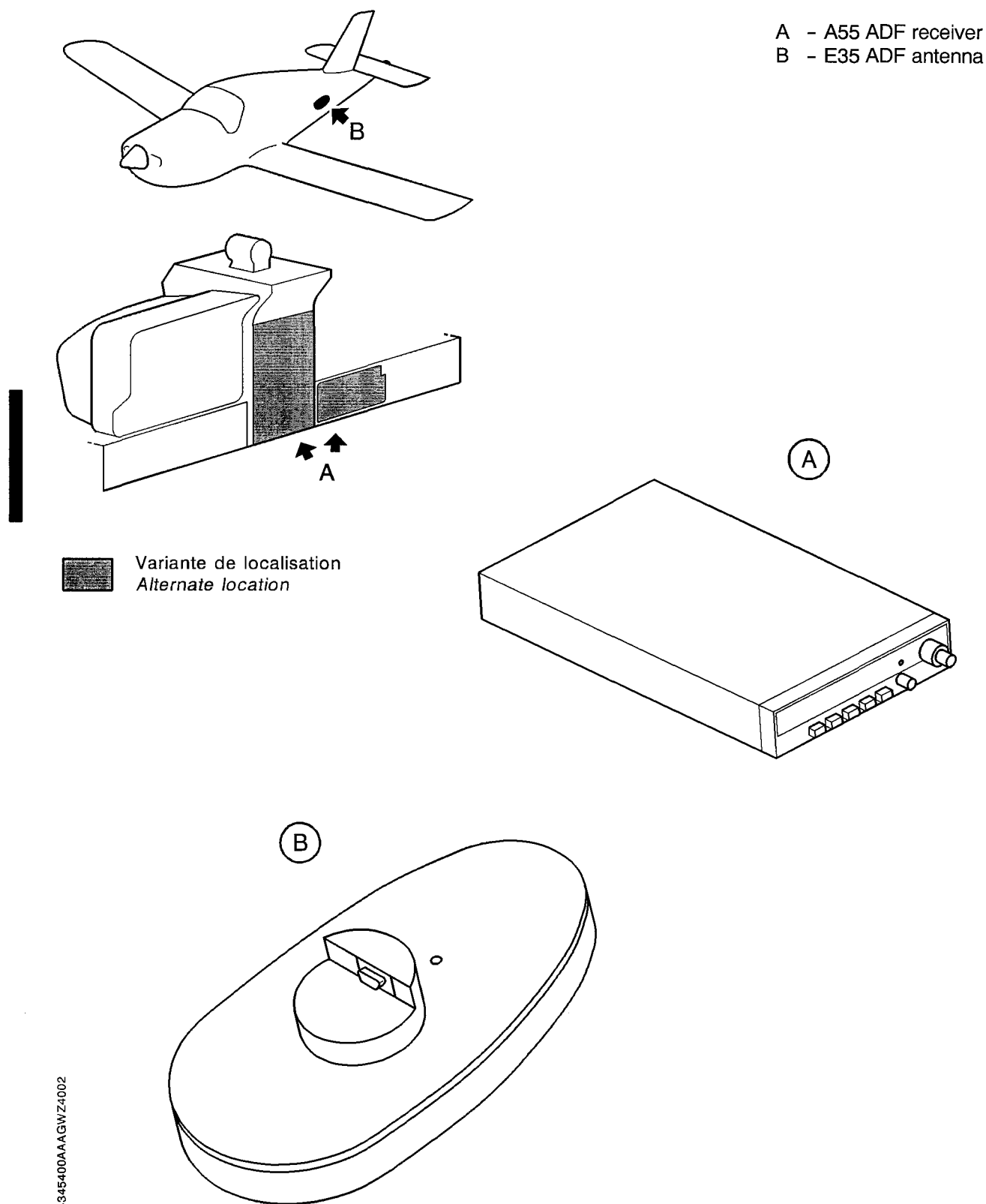
Validity : KR 87 / KR 87 SC+ with RMI

34-54-00 (BU)

Page 3
NOV 01



Automatic Direction Finder (ADF) - Electrical schematic
Figure 1B - 28 volts with radio master



Automatic Direction Finder (ADF) - Identification and location of components
Figure 2

3. DESCRIPTION

A. A55 ADF receiver (Figure 3)

A55 ADF receiver is destined to receive signals within a frequency range from 200 KHz to 1799 KHz in 1-KHz increments. It determines the ground station bearing information which is then forwarded to the indicators for information display.

A55 ADF receiver consists of a parallelepipedic rectangular box.

The rear section of the box features an antenna receptacle and a receptacle composed of a printed board plate.

The front panel of A55 ADF receiver consists of :

- a display for frequency, mode and time information visualisation. The display brightness is automatically controlled by a photocell.

The display is divided in two windows.

The frequency in use is displayed in the L.H. window.

The R.H. window displays :

- . a standby frequency,
- . or the time elapsed since the equipment energization ("FLT" function selected),
- . or the time elapsed or remaining since the "ET" function initialization ("ET" function selected).

- the following controls :

- . the "ADF" pushbutton which determines the receiver function mode, Automatic Direction Finder (ADF) mode or antenna (ANT) mode,
- . the Beat Frequency Oscillator "BFO" pushbutton which permits the identification of unmodulated stations which use an interrupted carrier (A1) for identification purposes,
- . the "FRQ" or "FRQ/<->" pushbutton,

The receiver is at all times tuned to the frequency displayed in the L.H. window. The pushbutton enables the frequency previously selected in the R.H. window to be transferred into the L.H. window and vice-versa.

- . the "ET/FLT" pushbutton makes it possible to display in the R.H. window one of the two timer functions :
 - the "FLT" (Flight Timer) function which measures the flight duration. The duration measurement starts as soon as equipment energization,
 - the "ET" (Elapsed Time) function is a programmable countdown timer.
- . the "SET/RST" button enables the pilot to program the countdown time of "ET" function,
- . the "OFF/VOL" control switch ensuring the ON/OFF function and audio volume adjustment,
- . the concentric knobs which allow either :
 - the selection of the frequency displayed in the L.H. window when one of the timer functions is displayed in the R.H. window,
 - or the selection of the frequency displayed in the R.H. window,
 - or the programming of the timer function "ET".

In ADF mode, A55 ADF receiver converts the RF signal generated by E35 ADF antenna into a bearing information.

The information is available in sine/cosine DC voltages format.

A55 ADF receiver is electrically supplied by "BUS 1" or "BUS 2" or "BUS 3" bars and protected by CB92 "ADF" circuit breaker.

A55 ADF receiver is mounted into PL30 radio rack or, in variant on the R.H. panel strip.

B. E35 ADF antenna

E35 ADF antenna combines into a single component a reception loop and its associated circuits (preamplifier and modulators) and a sense antenna with its preamplification circuit.

E35 ADF antenna features on its longitudinal axis two holes for its attachment on the aircraft fuselage. The assembly is topped with a cylindrical box which houses the electronic circuits. An electrical connector is secured on the box.

E35 ADF antenna provides A55 ADF receiver via a triaxial cable with an RF signal resulting from the combination of the signals detected by the loop and the sense antenna.

E35 ADF antenna is electrically supplied by A55 ADF receiver via a multiwire shielded cable.

E35 ADF antenna is mounted under the fuselage between C7 and C8 frames.

4. OPERATION

The ADF system operation consists of two modes of operation. In "ANT" (antenna) mode, A55 ADF receiver simply acts as an AM receiver using only the sense signal from E35 antenna. In "ADF" mode, A55 ADF receiver provides bearing information using the loop and sense signals from E35 antenna.

A. "ANT" (antenna) mode

The antenna mode is selected and annunciated when "ADF" pushbutton is in the out position. This mode is used for station identification. A55 ADF receiver processes the audio identification signal from the ADF ground station. The audio identification is then sent to A50 audio control box.

With KI 229 RMI

The dual pointer of radio magnetic indicator (RMI) is positioned at 90° to the right of fixed marker when "ANT" (antenna) mode is activated on A55 ADF receiver.

With KNI 582 RMI

The single and dual pointers set to "ADF" mode by means of the pushbuttons located on the front face of radio magnetic indicator are positioned at 90° to the right of fixed marker when "ANT" mode is activated on A55 ADF receiver.

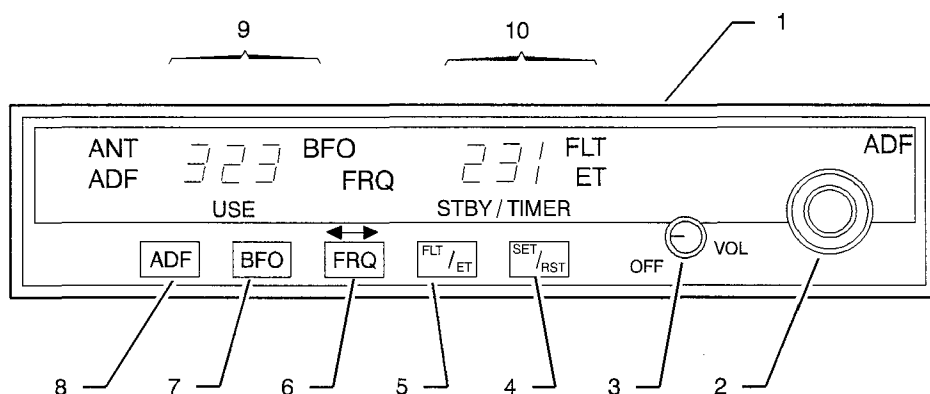
All

The "BFO" function makes it possible to more easily identify ADF stations using an interrupted carrier for identification.

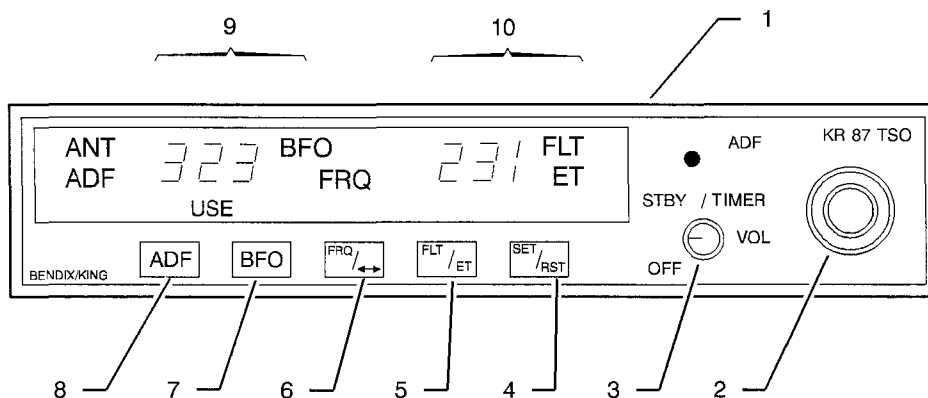
B. "ADF" mode

The "ADF" mode is selected and annunciated when "ADF" pushbutton is in the in position. A55 ADF receiver processes the loop and sense signals from E35 antenna and provides bearing information (DC sine/cosine format) to the radio magnetic indicator.

- 1 - A55 ADF receiver
- 2 - Frequency select knob
- 3 - "OFF/VOL" control switch
- 4 - "SET/RST" pushbutton function "ET"
- 5 - "ET/FLT" pushbutton
- 6 - "FRQ" or "FRQ/<->" pushbutton
- 7 - "BFO" pushbutton
- 8 - "ADF" pushbutton
- 9 - Operating frequency L.H. window
- 10 - (STBY) standby frequency R.H. window, "FLIGHT TIME" or "ELAPSED TIME"



KR 87



KR 87 SC+ (SLIVER CROWN PLUS)

Automatic Direction Finder (ADF) - A55 ADF receiver
Figure 3

AUTOMATIC DIRECTION FINDER (ADF)

DESCRIPTION AND OPERATION

1. GENERAL (Figures 1, 1A and 1B)

The Automatic Direction Finder (ADF) is a direction-finding device which allows to determine the direction of a radioelectric transmission.

The optional ADF installation gives azimuth indications which allow to point a position and to do alignments.

The ADF installation consists of :

- an A55 ADF receiver,
- an E35 ADF antenna,
- an M77 ADF indicator.

The ADF indicator receives signals from the slaved directional gyro - refer to 34-21-00.

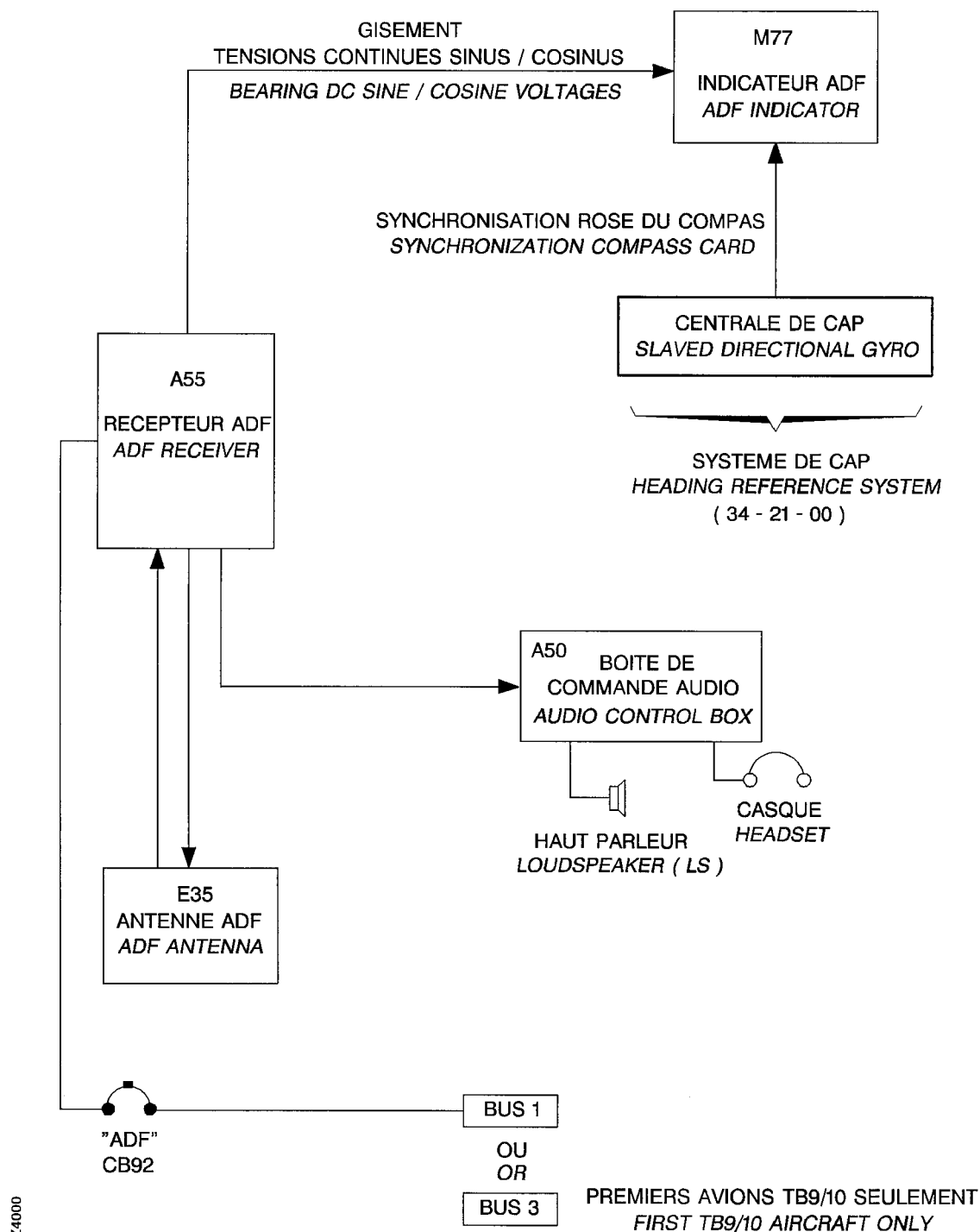
The ADF installation is connected to the optional audio control box - refer to 23-11-00.

The system is electrically supplied by "BUS 1" or "BUS 2" or "BUS 3" bars.

NOTE : For RUSSIAN and UKRAINIAN aircraft, ADF system is electrically supplied by "BUS 1" bar.

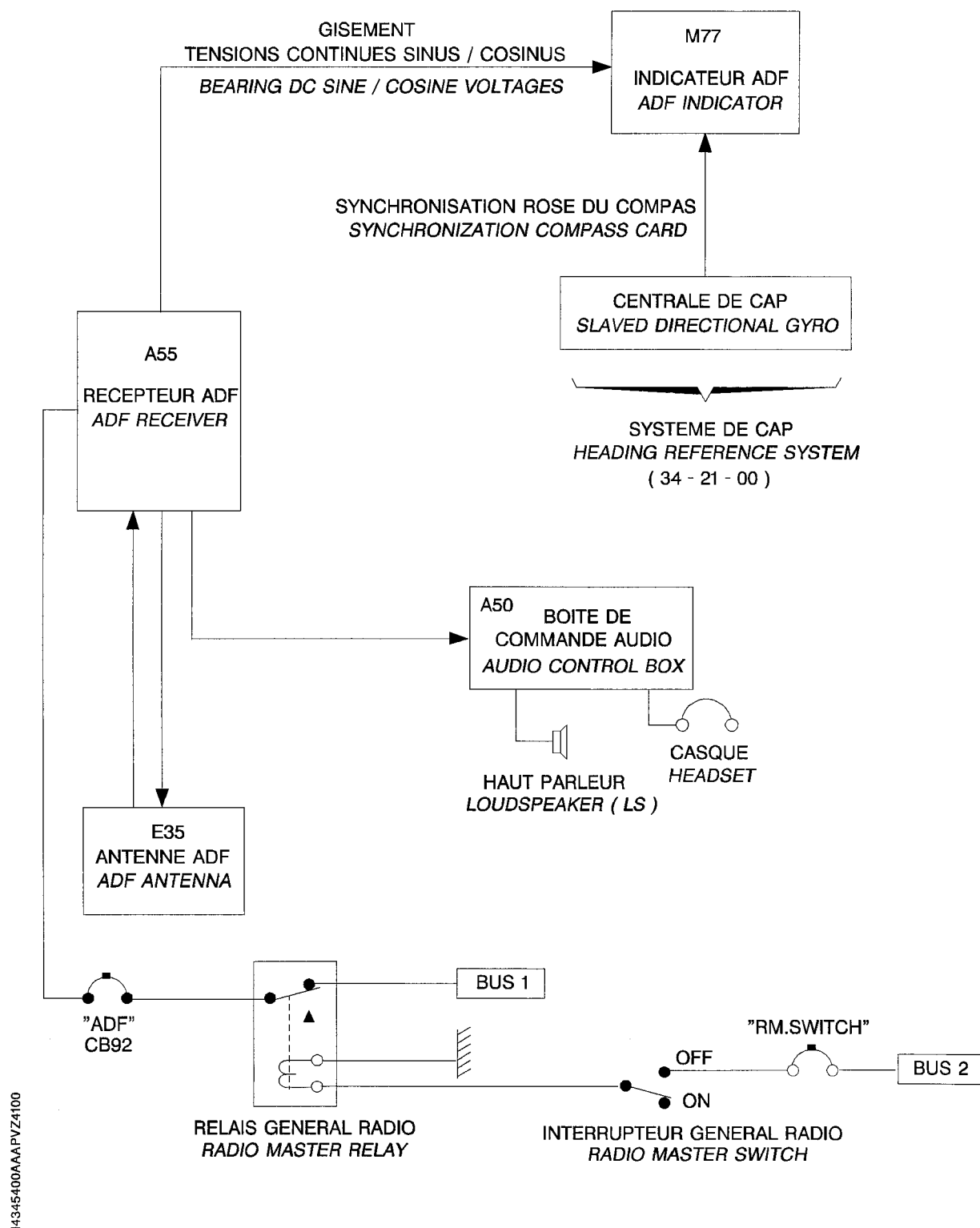
2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A55 ADF receiver	1	251C or 254R	/	34-50-00
E35 ADF antenna	1	220	242	34-54-05
M77 ADF indicator	1	251L	/	34-54-00
Circuit breaker : - CB92 "ADF"	1	230	232L	WM

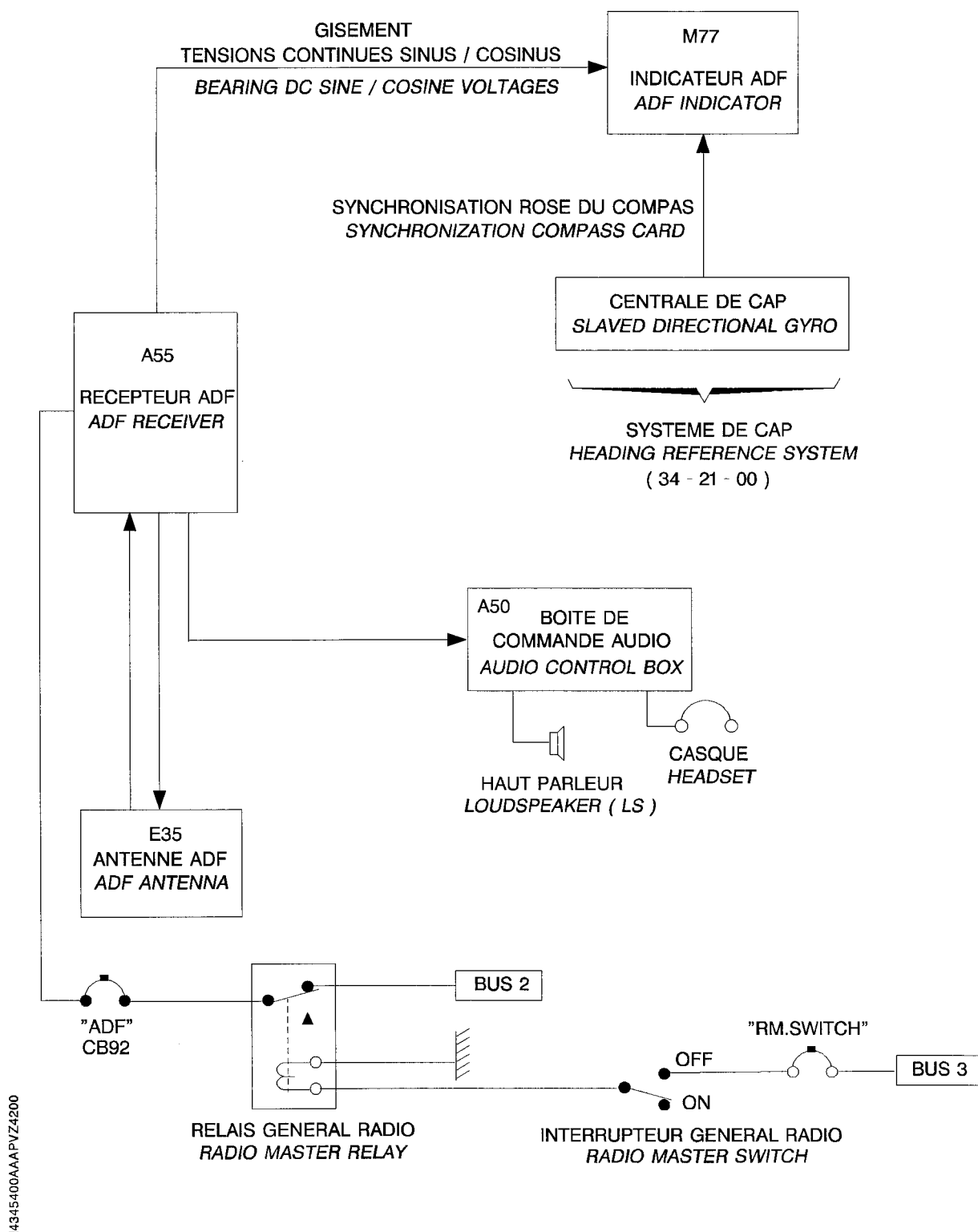


14345400AAAPVZ4000

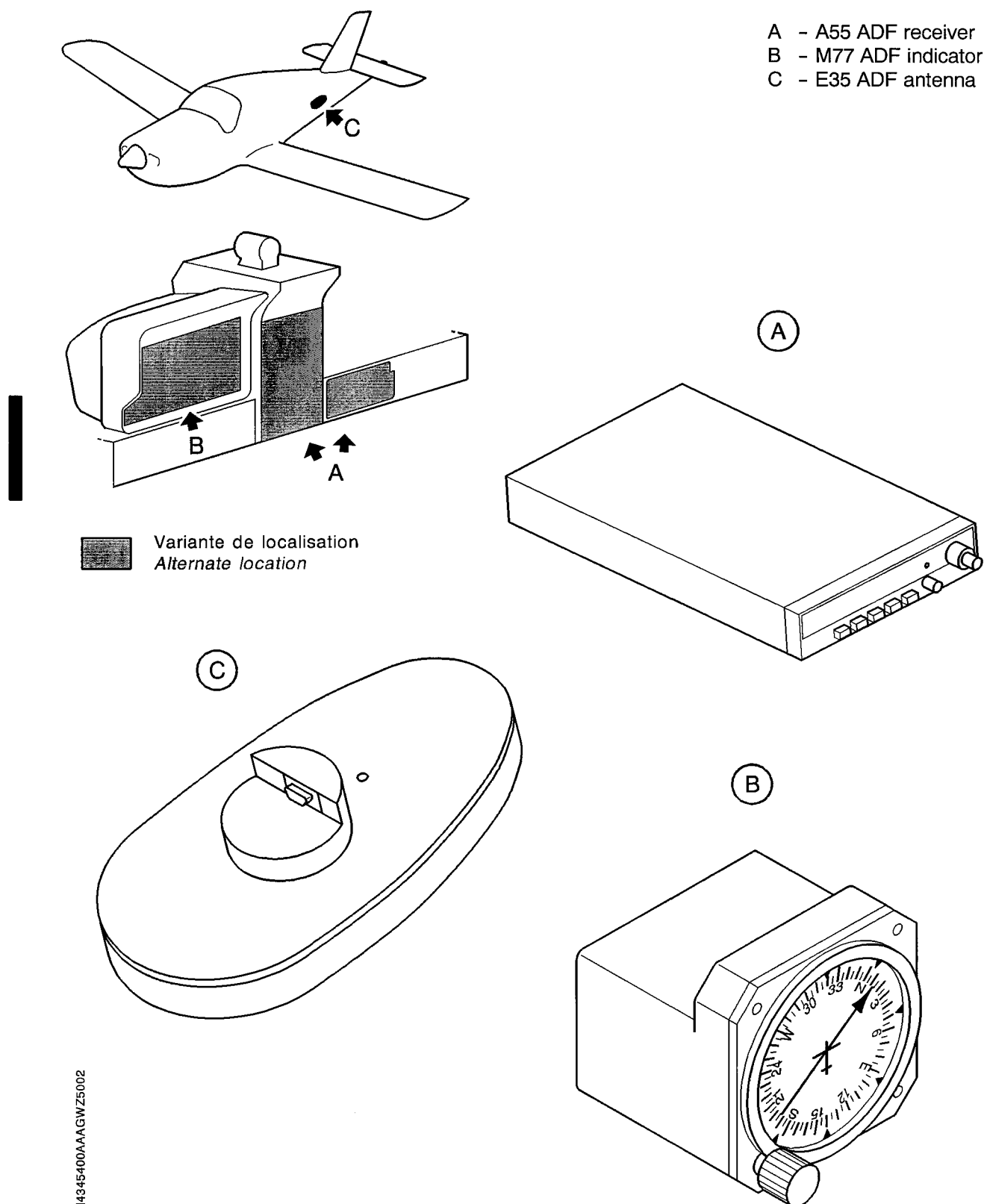
Automatic Direction Finder (ADF) - Electrical schematic
Figure 1 - 14 volts without radio master



Automatic Direction Finder (ADF) - Electrical schematic
Figure 1A - 14 volts with radio master



Automatic Direction Finder (ADF) - Electrical schematic
Figure 1B - 28 volts with radio master



Automatic Direction Finder (ADF) - Identification and location of components
Figure 2

3. DESCRIPTION

A. A55 ADF receiver (Figure 3)

A55 ADF receiver is destined to receive signals within a frequency range from 200 KHz to 1799 KHz in 1-KHz increments. It determines the ground station bearing information which is then forwarded to the indicators for information display.

A55 ADF receiver consists of a parallelepipedic rectangular box.

The rear section of the box features an antenna receptacle and a receptacle composed of a printed board plate.

The front panel of A55 ADF receiver consists of :

- a display for frequency, mode and time information visualisation. The display brightness is automatically controlled by a photocell.

The display is divided in two windows.

The frequency in use is displayed in the L.H. window.

The R.H. window displays :

- . a standby frequency,
- . or the time elapsed since the equipment energization ("FLT" function selected),
- . or the time elapsed or remaining since the "ET" function initialization ("ET" function selected).

- the following controls :

- . the "ADF" pushbutton which determines the receiver function mode, Automatic Direction Finder (ADF) mode or antenna (ANT) mode,
- . the Beat Frequency Oscillator "BFO" pushbutton which permits the identification of unmodulated stations which use an interrupted carrier (A1) for identification purposes,
- . the "FRQ" or "FRQ/<->" pushbutton,

The receiver is at all times tuned to the frequency displayed in the L.H. window. The pushbutton enables the frequency previously selected in the R.H. window to be transferred into the L.H. window and vice-versa.

- . the "ET/FLT" pushbutton makes it possible to display in the R.H. window one of the two timer functions :
 - the "FLT" (Flight Timer) function which measures the flight duration. The duration measurement starts as soon as equipment energization,
 - the "ET" (Elapsed Time) function is a programmable countdown timer.
- . the "SET/RST" button enables the pilot to program the countdown time of "ET" function,
- . the "OFF/VOL" control switch ensuring the ON/OFF function and audio volume adjustment,
- . the concentric knobs which allow either :
 - the selection of the frequency displayed in the L.H. window when one of the timer functions is displayed in the R.H. window,
 - or the selection of the frequency displayed in the R.H. window,
 - or the programming of the timer function "ET".

In ADF mode, A55 ADF receiver converts the RF signal generated by E35 ADF antenna into a bearing information.

The information is available in sine/cosine DC voltages format.

A55 ADF receiver is electrically supplied by "BUS 1" or "BUS 2" or "BUS 3" bars and protected by CB92 "ADF" circuit breaker.

A55 ADF receiver is mounted into PL30 radio rack, or in variant on the R.H. panel strip.

B. E35 ADF antenna

E35 ADF antenna combines into a single component a reception loop and its associated circuits (preamplifier and modulators) and a sense antenna with its preamplification circuit.

E35 ADF antenna features on its longitudinal axis two holes for its attachment on the aircraft fuselage. The assembly is topped with a cylindrical box which houses the electronic circuits. An electrical connector is secured on the box.

E35 ADF antenna provides A55 ADF receiver via a triaxial cable with an RF signal resulting from the combination of the signals detected by the loop and the sense antenna.

E35 ADF antenna is electrically supplied by A55 ADF receiver via a multiwire shielded cable.

E35 ADF antenna is mounted under the fuselage between C7 and C8 frames.

C. M77 ADF indicator

The ADF indicator displays the ground station bearing.

The front panel of the indicator includes :

- a moving compass card,
- a single bar pointer indicating bearing information,
- a "SYNC" knob used to synchronize the value displayed on the ADF indicator compass card with the value displayed on the Horizontal Situation Indicator (HSI) compass card.

The indicator receives the bearing information directly from the ADF A55 receiver in sine and cosine DC voltage format. It also receives signals from A70 slaved directional gyro to control the rotation of its compass card.

The indicator is mounted on the L.H. instrument panel.

4. OPERATION

The ADF system operation consists of two modes of operation. In "ANT" (antenna) mode, A55 ADF receiver simply acts as an AM receiver using only the sense signal from E35 antenna. In "ADF" mode, A55 ADF receiver provides bearing information using the loop and sense signals from E35 antenna.

A. "ANT" (antenna) mode

The antenna mode is selected and annunciated when "ADF" pushbutton is in the out position. This mode is used for station identification. A55 ADF receiver processes the audio identification signal from the ADF ground station. The audio identification is then sent to A50 audio control panel.

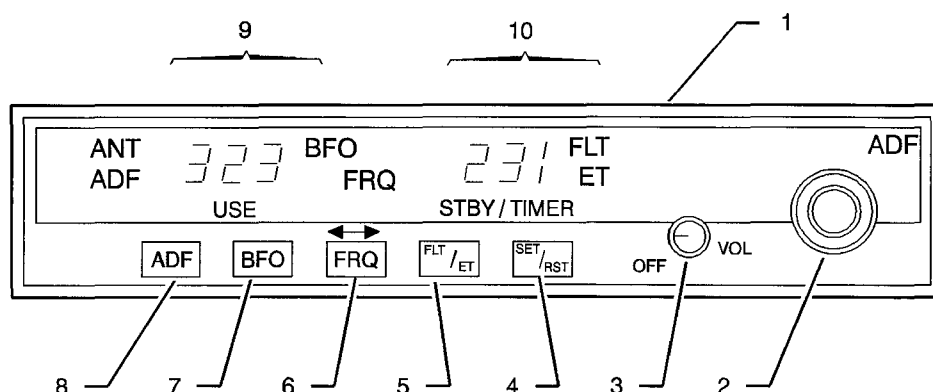
The "BFO" function makes it possible to more easily identify ADF stations using an interrupted carrier for identification.

B. "ADF" mode

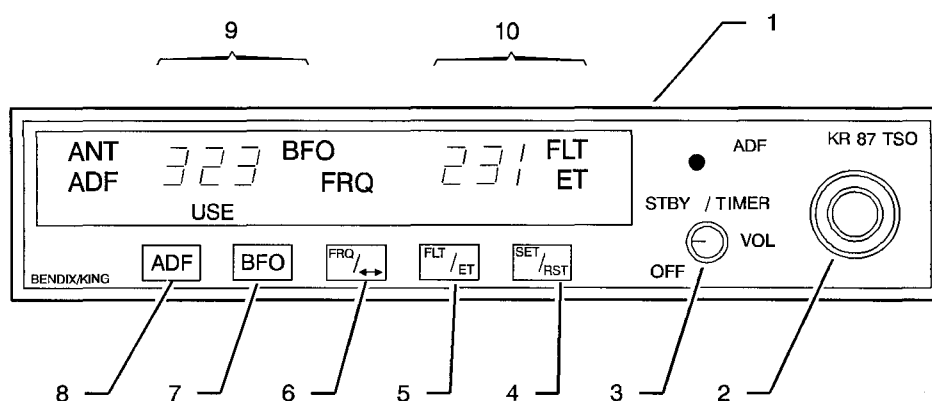
The "ADF" mode is selected and annunciated when "ADF" pushbutton is in the in position. A55 ADF receiver processes the loop and sense signals from E35 antenna and provides bearing information to M77 ADF indicator.

The compass card is partially slaved to the HSI, the heading indicated by the HSI and the heading indicated by the ADF indicator can be manually synchronized by rotating the "SYNC" knob. The synchronization of headings should be checked from time to time, or after steep bank turns. If there is a discrepancy between the reference heading and the heading indicated by the ADF indicator, use the "SYNC" knob to resynchronize.

- 1 - A55 ADF receiver
- 2 - Frequency select knobs
- 3 - OFF/VOL control switch
- 4 - "SET / RST" button, "ET" function
- 5 - "ET / FLT" pushbutton
- 6 - "FRQ" or "FRQ/<->" pushbutton
- 7 - "BFO" pushbutton
- 8 - "ADF" pushbutton
- 9 - L.H. window, operating frequency
- 10 - R.H. window, STBY frequency, Flight time or Elapsed time



KR 87



KR 87 SC+ (SLIVER CROWN PLUS)

Automatic Direction Finder (ADF) - A55 ADF receiver
Figure 3

AGAG

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AUTOMATIC DIRECTION FINDER (ADF)**DESCRIPTION AND OPERATION****1. GENERAL (Figures 1, 1A and 1B)**

The Automatic Direction Finder (ADF) is a direction-finding device which allows to determine the direction of a radioelectric transmission.

The optional ADF installation gives azimuth indications which allow to point a position and to do alignments.

The ADF installation consists of :

- an A55 ADF receiver,
- an E35 ADF antenna,
- an M77 ADF indicator.

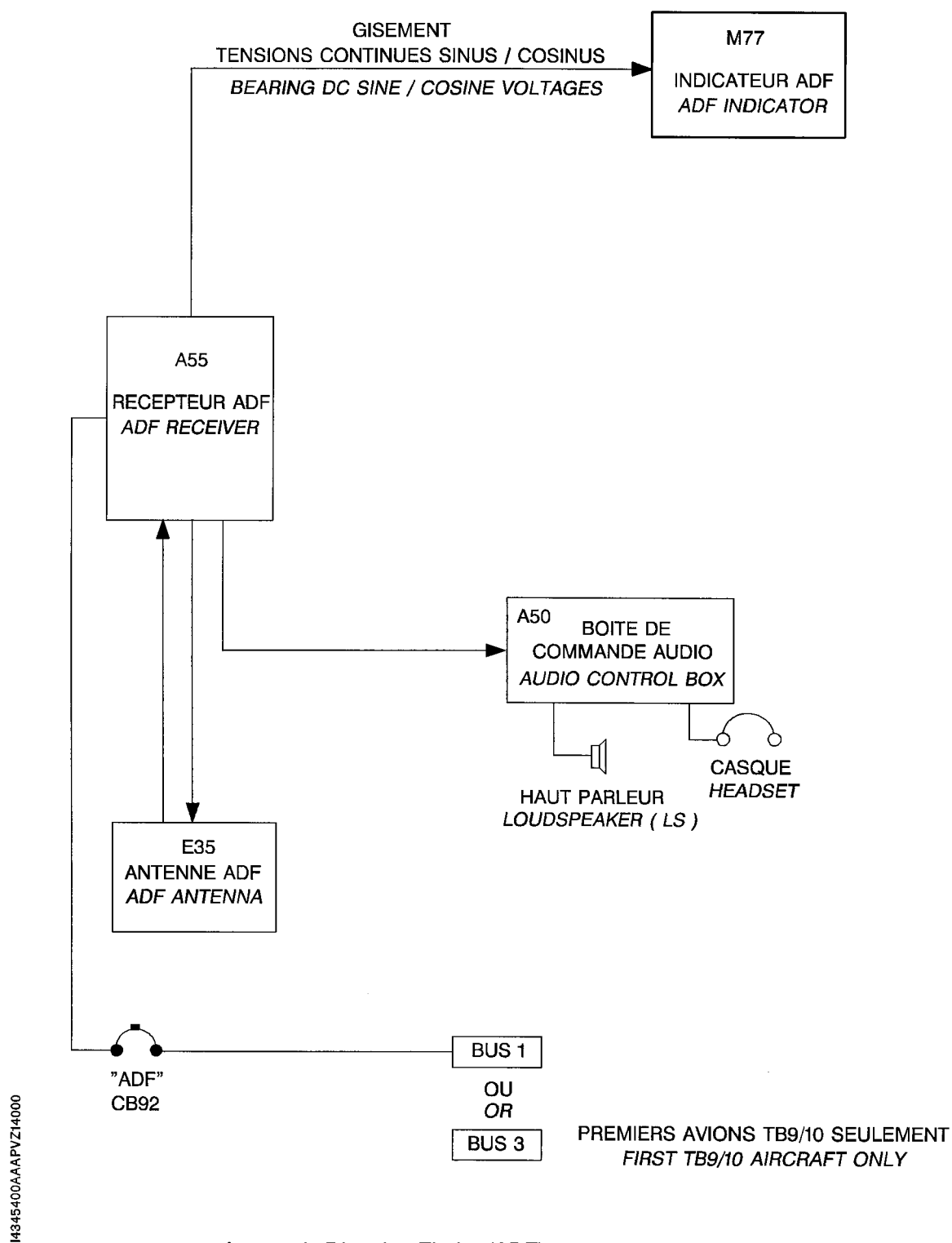
The ADF installation is connected to the optional audio control box - refer to 23-11-00.

The system is electrically supplied by "BUS 1" or "BUS 2" or "BUS 3" bars.

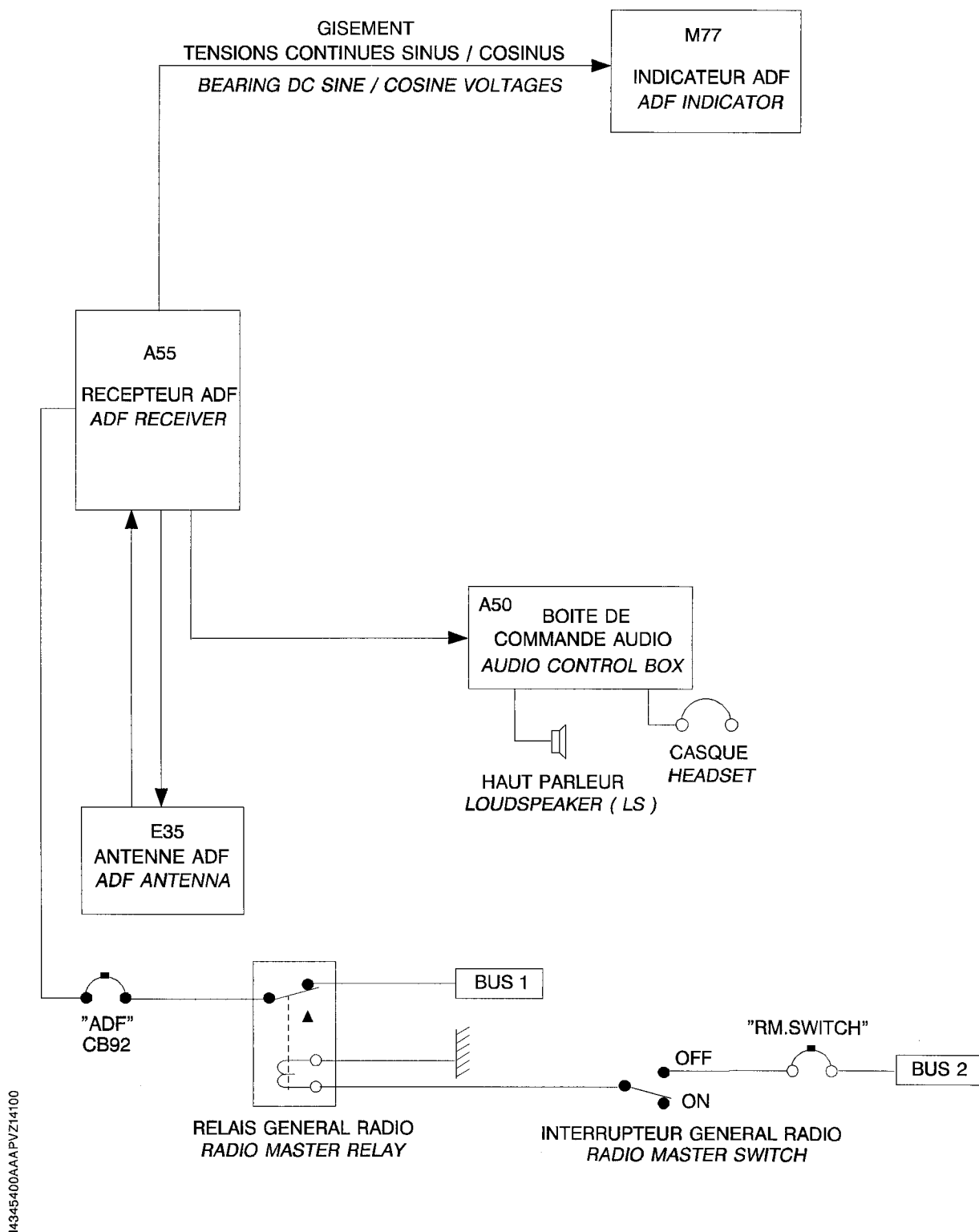
NOTE : For RUSSIAN and UKRAINIAN aircraft, ADF system is electrically supplied by "BUS 1" bar.

2. LOCATION (Figures 2 and 3)

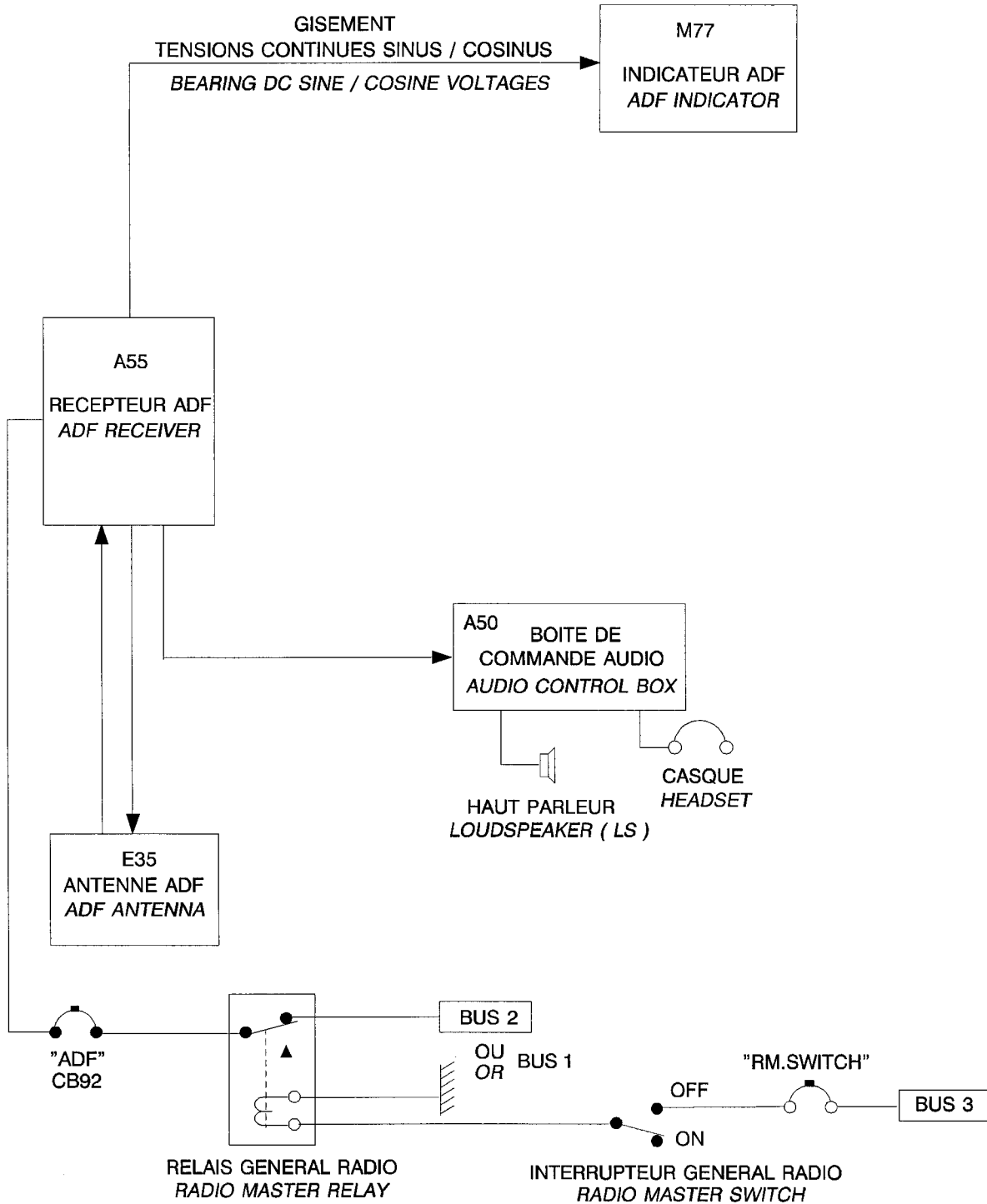
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A55 ADF receiver	1	251C or 254R	/	34-50-00
E35 ADF antenna	1	220	242	34-54-05
M77 ADF indicator	1	251L or 254L	/	34-54-00
Circuit breaker : - CB92 "ADF"	1	230	232L	WM



Automatic Direction Finder (ADF) - Electrical schematic
Figure 1 - 14 volts without radio master

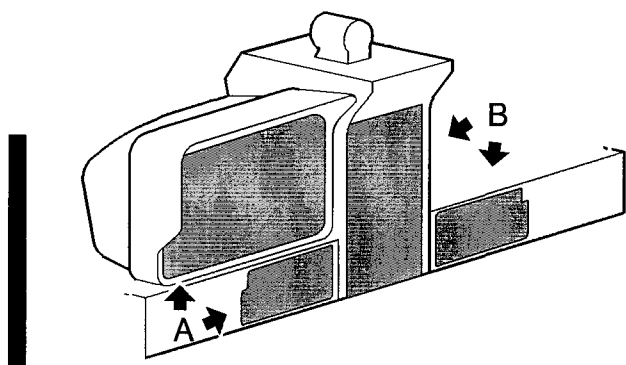


Automatic Direction Finder (ADF) - Electrical schematic
Figure 1A - 14 volts with radio master



I4345400AAAPVZ14200

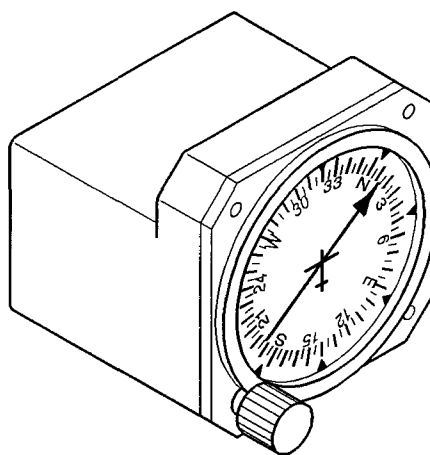
Automatic Direction Finder (ADF) - Electrical schematic
Figure 1B - 28 volts with radio master



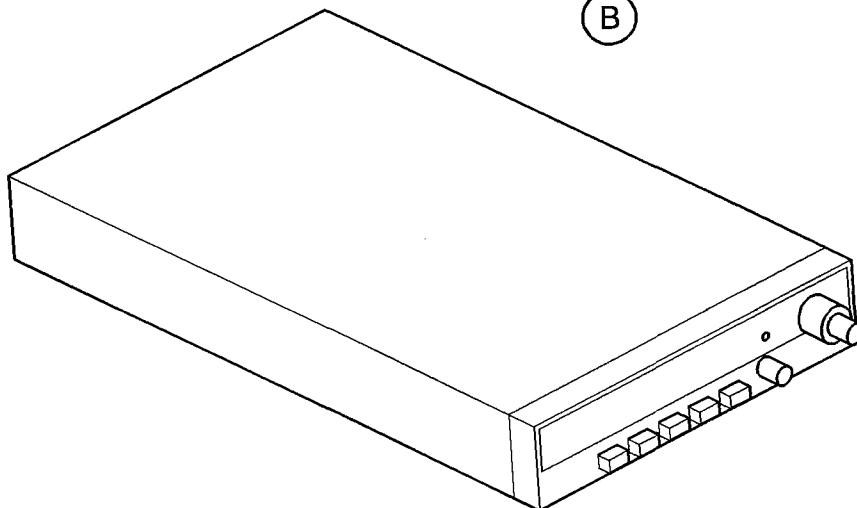
A - M77 ADF indicator
B - A55 ADF receiver

 Variante de localisation
Alternate location

(A)



(B)



14345400AAA FVZ4101

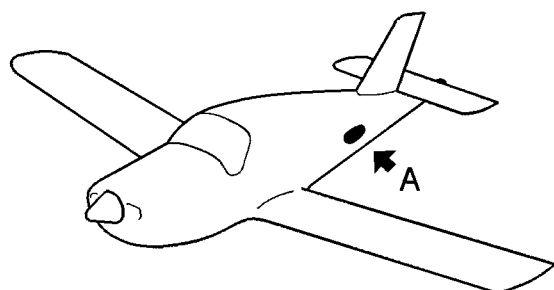
Automatic Direction Finder (ADF) – Identification and location of components
Figure 2

AHAH

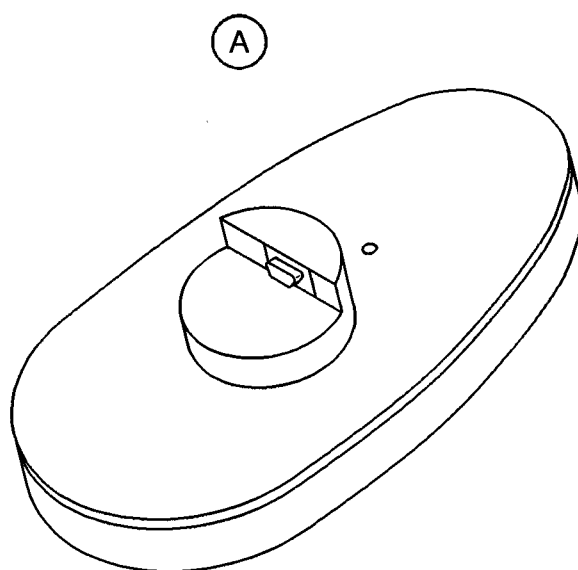
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A - E35 ADF antenna



14345400AAAGWZ14000

Automatic Direction Finder (ADF) - Identification and location of components
Figure 3

3. DESCRIPTION

A. A55 ADF receiver (Figure 4)

A55 ADF receiver is destined to receive signals within a frequency range from 200 KHz to 1799 KHz in 1-KHz increments. It determines the ground station bearing information which is then forwarded to the indicators for information display.

A55 ADF receiver consists of a parallelepipedic rectangular box.

The rear section of the box features an antenna receptacle and a receptacle composed of a printed board plate.

The front panel of A55 ADF receiver consists of :

- a display for frequency, mode and time information visualisation. The display brightness is automatically controlled by a photocell.

The display is divided in two windows.

The frequency in use is displayed in the L.H. window.

The R.H window displays :

- a standby frequency,
 - or the time elapsed since the equipment energization ("FLT" function selected),
 - or the time elapsed or remaining since the "ET" function initialization ("ET" function selected).
- the following controls :
 - the "ADF" pushbutton which determines the receiver function mode, Automatic Direction Finder (ADF) mode or antenna (ANT) mode,
 - the Beat Frequency Oscillator "BFO" pushbutton which permits the identification of unmodulated stations which use an interrupted carrier (A1) for identification purposes,
 - the "FRQ" or "FRQ/<->", pushbutton,

The receiver is at all times tuned to the frequency displayed in the L.H. window. The pushbutton enables the frequency previously selected in the R.H. window to be transferred into the L.H. window and vice-versa.

- the "ET/FLT" pushbutton makes it possible to display in the R.H. window one of the two timer functions :
 - the "FLT" (Flight Timer) function which measures the flight duration. The duration measurement starts as soon as equipment energization,
 - the "ET" (Elapsed Time) function is a programmable countdown timer.
- the "SET/RST" button enables the pilot to program the countdown time of "ET" function,
- the "OFF/VOL" control switch ensuring the ON/OFF function and audio volume adjustment,
- the concentric knobs which allow either :
 - the selection of the frequency displayed in the L.H. window when one of the timer functions is displayed in the R.H. window,
 - or the selection of the frequency displayed in the R.H. window,
 - or the programming of the timer function "ET".

In ADF mode, A55 ADF receiver converts the RF signal generated by E35 ADF antenna into a bearing information.

The information is available in sine/cosine DC voltages format.

A55 ADF receiver is electrically supplied by "BUS 1" or "BUS 2" or "BUS 3" bars and protected by CB92 "ADF" circuit breaker.

A55 ADF receiver is mounted into PL30 radio rack, or in variant on R.H. panel strip.

B. E35 ADF antenna

E35 ADF antenna combines into a single component a reception loop and its associated circuits (preamplifier and modulators) and a sense antenna with its preamplification circuit.

E35 ADF antenna features on its longitudinal axis two holes for its attachment on the aircraft fuselage. The assembly is topped with a cylindrical box which houses the electronic circuits. An electrical connector is secured on the box.

E35 ADF antenna provides A55 ADF receiver via a triaxial cable with an RF signal resulting from the combination of the signals detected by the loop and the sense antenna.

E35 ADF antenna is electrically supplied by A55 ADF receiver via a multiwire shielded cable.

E35 ADF antenna is mounted under the fuselage between C7 and C8 frames.

C. M77 ADF indicator

The ADF indicator displays the ground station bearing.

The front panel of the indicator includes :

- a moving compass card,
- a single bar pointer indicating bearing information,
- a HDG knob which enables compass card rotation.

The indicator receives the bearing information directly from the ADF A55 receiver in sine and cosine DC voltage format.

The indicator is mounted on the L.H. instrument panel.

4. OPERATION

The ADF system operation consists of two modes of operation. In "ANT" (antenna) mode, A55 ADF receiver simply acts as an AM receiver using only the sense signal from E35 antenna. In "ADF" mode, A55 ADF receiver provides bearing information using the loop and sense signals from E35 antenna.

A. "ANT" (antenna) mode

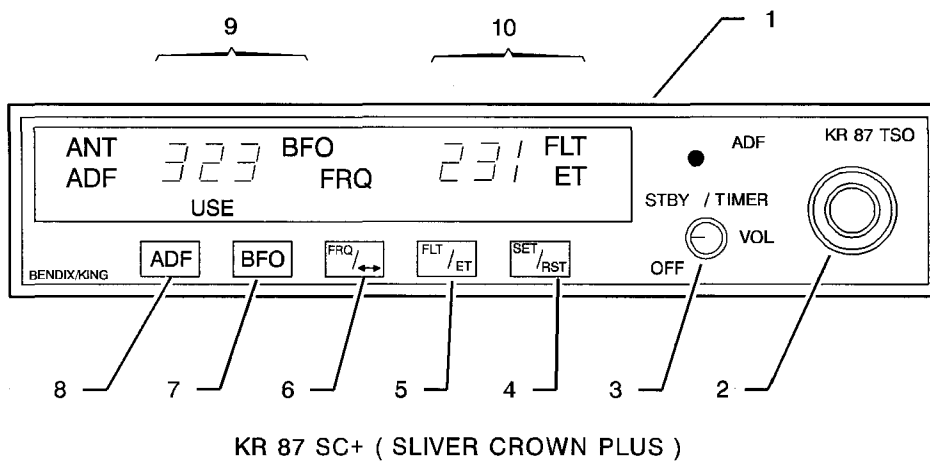
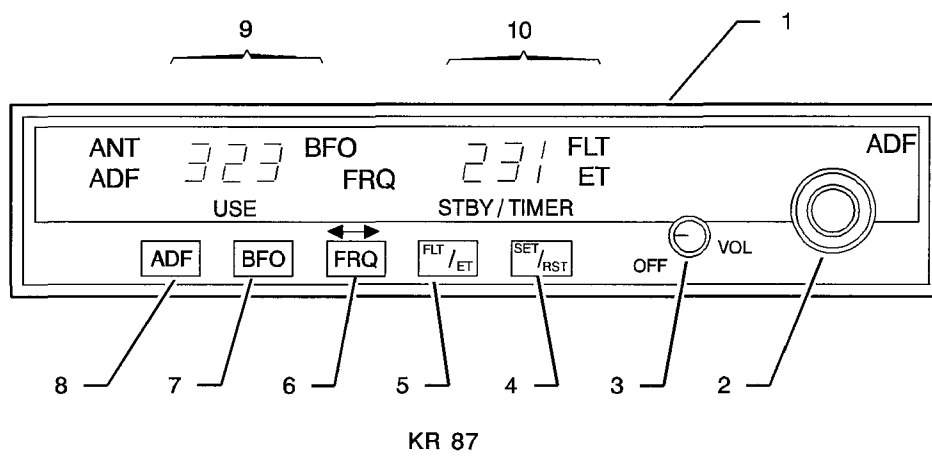
The antenna mode is selected and annunciated when "ADF" pushbutton is in the out position. This mode is used for station identification. A55 ADF receiver processes the audio identification signal from the ADF ground station. The audio identification is then sent to A50 audio control panel.

The "BFO" function makes it possible to more easily identify ADF stations using an interrupted carrier for identification.

B. "ADF" mode

The "ADF" mode is selected and annunciated when "ADF" pushbutton is in the in position. A55 ADF receiver processes the loop and sense signals from E35 antenna and provides bearing information to M77 ADF indicator.

- 1 - A55 ADF receiver
- 2 - Frequency select knobs
- 3 - OFF/VOL control switch
- 4 - "SET / RST" button, "ET" function
- 5 - "ET / FLT" pushbutton
- 6 - "FRQ" or "FRQ/<->" pushbutton
- 7 - "BFO" pushbutton
- 8 - "ADF" pushbutton
- 9 - L.H. window, operating frequency
- 10 - R.H. window, STBY frequency, Flight time or Elapsed time



Automatic Direction Finder (ADF) - A55 ADF receiver
Figure 4

AUTOMATIC DIRECTION FINDER (ADF) DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The Automatic Direction Finder (ADF) is a direction-finding system which enables the direction of a radioelectric transmission to be determined.

The optional ADF installation gives azimuth indications which enable a position to be pointed and the alignments to be carried out. The ADF installation requires two ADF systems.

The ADF installation consists of :

- the A55 ADF receiver,
- the A58 ADF receiver,
- the M77 ADF indicator,
- the E35 ADF antenna,
- the E15 ADF antenna,
- the S203 "AUDIO SELECT ADF1/ADF2" switch.

M77 ADF indicator is designed to operate with the installation but it can be replaced by the optional KNI 582 RMI - refer to 34-25-00.

The two ADF systems send an audio signal to the audio control box through S203 switch - refer to 23-11-00.

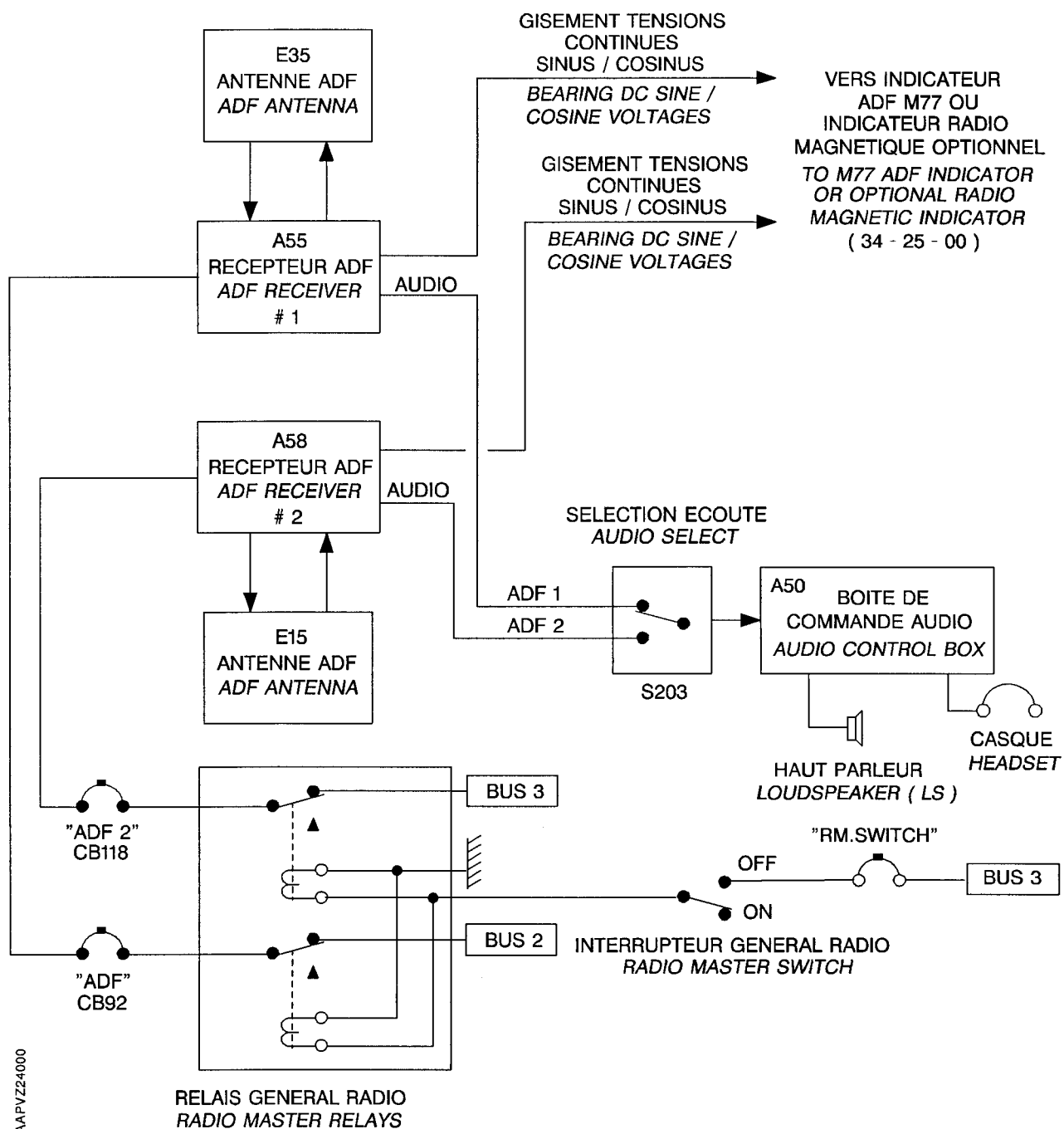
The ADF 1 system is electrically supplied by "BUS 2" bar.

The ADF 2 system is electrically supplied by "BUS 3" bar.

NOTE : For RUSSIAN and UKRAINIAN aircraft, ADF 1 system is electrically supplied by "BUS 1" bar.

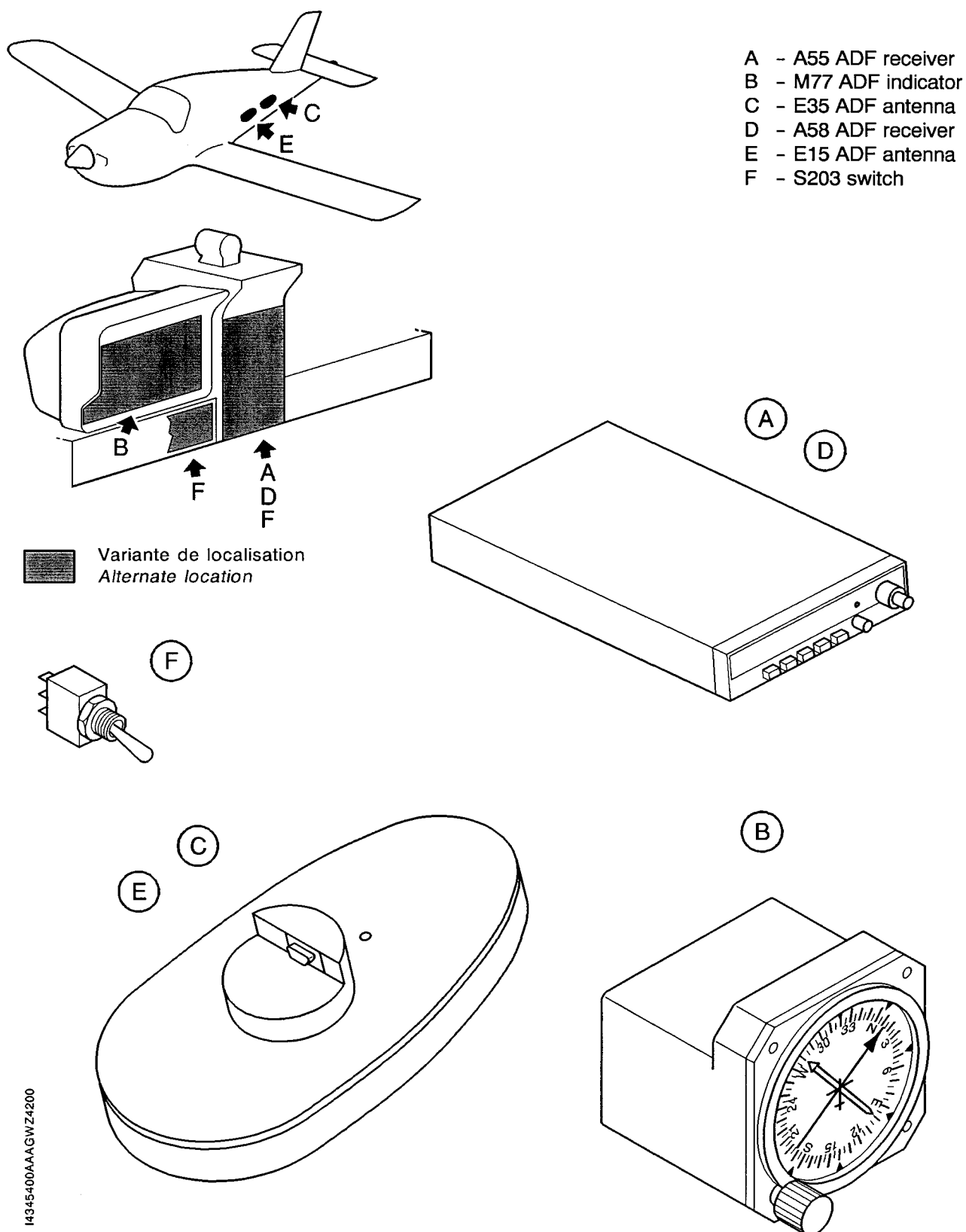
2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A55 ADF 1 receiver	1	251C	/	34-50-00
A58 ADF 2 receiver	1	251C	/	34-50-00
M77 ADF indicator	1	251L	/	34-54-00
E35 ADF 1 antenna	1	220	242	34-54-05
E15 ADF 2 antenna	1	210	244C	34-54-05
S203 "AUDIO SELECT ADF1/ADF2" switch	1	251C or 254L	/	34-54-00
Circuit breakers :				
- CB92 "ADF"	1	230	232L	WM
- CB118 "ADF 2"	1	230	232L	WM



14345400AAAPVZ24000

Automatic Direction Finder (ADF) - Electrical schematic
Figure 1



Automatic Direction Finder (ADF) - Identification and location of components
Figure 2

3. DESCRIPTION

A. A55 / A58 ADF receiver (Figure 3)

A55 / A58 ADF receiver is destined to receive signals within a frequency range from 200 KHz to 1799 KHz in 1-KHz increments. It determines the ground station bearing information which is then forwarded to the indicators for information display.

A55 / A58 ADF receiver consists of a parallelepipedic rectangular box.

The rear section of the box features an antenna receptacle and a receptacle composed of a printed board plate.

The front panel of A55 / A58 ADF receiver consists of :

- a display for frequency, mode and time information visualisation. The display brightness is automatically controlled by a photocell.

The display is divided in two windows : "USE" and "STBY/TIMER".

The frequency in use is displayed in the "USE" window.

The "STBY/TIMER" window displays :

- . a standby frequency,
- . or the time elapsed since the equipment energization ("FLT" function selected),
- . or the time elapsed or remaining since the "ET" function initialization ("ET" function selected).
- the following controls :
 - . the "ADF" pushbutton which determines the receiver function mode, Automatic Direction Finder (ADF) mode or antenna (ANT) mode,
 - . the Beat Frequency Oscillator "BFO" pushbutton which permits the identification of unmodulated stations which use an interrupted carrier (A1) for identification purposes,
 - . the "FRQ" pushbutton,

The receiver is at all times tuned to the frequency displayed in the "USE" window. The "FRQ" pushbutton enables the frequency previously selected in the "STBY/TIMER" window to be transferred into the "USE" window.

- . the "ET/FLT" pushbutton makes it possible to display in the "STBY/TIMER" window one of the two timer functions :
 - the "FLT" (Flight Timer) function which measures the flight duration. The duration measurement starts as soon as equipment energization,
 - the "ET" (Elapsed Time) function is a programmable countdown timer.
- . the "SET/RST" button enables the pilot to program the countdown time of "ET" function,
- . the "OFF/VOL" control switch ensuring the ON/OFF function and audio volume adjustment,
- . the concentric knobs which allow either :
 - the selection of the frequency displayed in the "USE" window when one of the timer functions is displayed in the "STBY/TIMER" window,
 - or the selection of the frequency displayed in the "STBY/TIMER" window,
 - or the programming of the timer function "ET".

In ADF mode, A55 / A58 ADF receiver converts the RF signal generated by E35 / E15 ADF antenna into a bearing information.

The information is available in sine/cosine DC voltages format.

A55 ADF receiver is electrically supplied by "BUS 2" or "BUS 1" bars and protected by CB92 "ADF" circuit breaker.

A58 ADF receiver is electrically supplied by "BUS 3" bar and protected by CB118 "ADF 2" circuit breaker.

A55 / A58 ADF receiver is mounted into PL30 radio rack.

B. E35 / E15 ADF antenna

E35 / E15 ADF antenna combines into a single component a reception loop and its associated circuits (preamplifier and modulators) and a sense antenna with its preamplification circuit.

E35 / E15 ADF antenna features on its longitudinal axis two holes for its attachment on the aircraft fuselage. The assembly is topped with a cylindrical box which houses the electronic circuits. An electrical connector is secured on the box.

E35 / E15 ADF antenna provides A55 / A58 ADF receiver via a triaxial cable with an RF signal resulting from the combination of the signals detected by the loop and the sense antenna.

E35 / E15 ADF antenna is electrically supplied by A55 / A58 ADF receiver via a multiwire shielded cable.

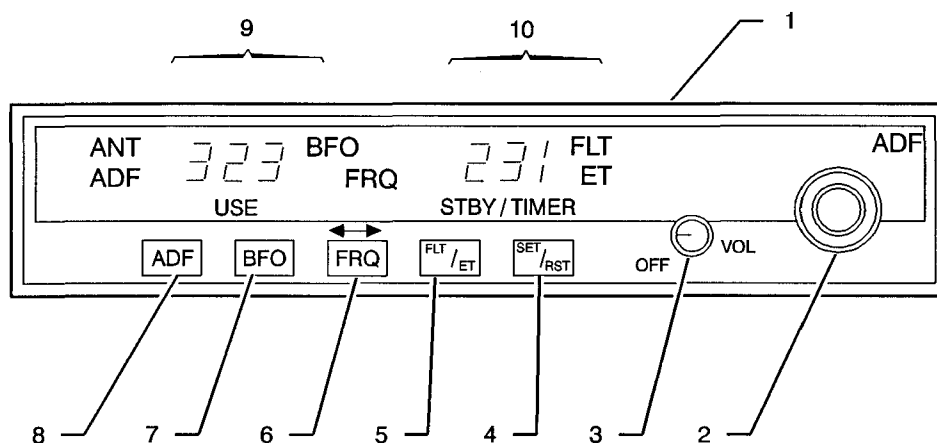
E35 ADF antenna is mounted under the fuselage between C7 and C8 frames.

E15 ADF antenna is mounted under the fuselage in front of C6 frame.

4. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

- 1 - A55 / A58 ADF receiver
- 2 - Frequency select knobs
- 3 - OFF/VOL control switch
- 4 - Set and reset ELAPSED TIMER
- 5 - Select FLIGHT TIMER or ELAPSED TIMER
- 6 - Frequency transfer button
- 7 - Select BFO
- 8 - Select ANT and ADF modes
- 9 - IN USE Frequency
- 10 - STANDBY frequency, FLIGHT TIME or ELAPSED TIME



Automatic Direction Finder (ADF) - A55 ADF receiver
Figure 3

AUTOMATIC DIRECTION FINDER (ADF)

ADJUSTMENT / TEST

1. OPERATIONAL TEST OF AUTOMATIC DIRECTION FINDER (ADF)

A. Tools and consumable materials

- Ground power unit

B. Procedure

- 1) Park the aircraft on a clear area.
- 2) Make sure that the main switch-breaker is open.
- 3) Connect the ground power unit - refer to 24-40-00.
- 4) Close main switch-breaker.
- 5) Connect the headset to pilot connection jacks.
- 6) On the A50 audio control panel, select the ADF audio output on the headset.
- 7) Set the radio master switch to "ON".

With ADF KI 227-01 indicator

- 8) On the M70 compensator box of the heading reference system, make sure that the "SLAVE -FREE" selector is set to "SLAVE"

NOTE : Wait a few minutes for the gyroscope of the slaved directional gyro of the heading reference system to reach its operation speed.

- 9) On the M73 horizontal situation indicator, make sure that the "HDG" warning flag is not into view.
- 10) On the ADF indicator, with the "SYNC" knob, synchronize the compass card with the one of M73 horizontal situation indicator if the displayed data are different.
- 11) On the M70 compensator box, set the "SLAVE/FREE" selector to "FREE".
- 12) On the M70 compensator box, set and hold the "CCW/CW" selector to "CW".
- 13) Make sure that the compass card of the ADF indicator follows the compass card of the M73 horizontal situation indicator.
- 14) Release the "CCW/CW" selector.
- 15) On the M70 compensator box, set the "SLAVE/FREE" selector to "SLAVE".

With RMI indicator

- 8) On the M70 compensator box of the heading reference system, make sure that the "SLAVE/FREE" selector is set to "SLAVE".

NOTE : Wait a few minutes for the gyroscope of the slaved directional gyro of the heading reference system to reach its operation speed.

- 9) On the M73 horizontal situation indicator, make sure that the "HDG" warning flag is not into view.
- 10) On the RMI indicator, make sure that the displayed magnetic heading is the same as the one of the horizontal situation indicator.

- 11) On RMI KNI 582 only, use the pushbuttons on the front face and select ADF mode for each bar pointer.
All
- 16) With the "OFF/VOL" knob, energize the A55 ADF receiver.
- 17) Perform the following test :

ACTION	RESULT
(1) On the ADF receiver, momentarily press the "FRQ" or "FRQ/<->" pushbutton.	(a) The R.H. display window shows a standby frequency. (b) "FRQ" message appears.
(2) On the ADF receiver, set the "ADF" pushbutton to pulled-out position.	(a) "ANT" message appears.
(3) Turn the concentric knobs to enter the frequency of one known ADF station.	(a) The frequency of the selected ADF station appears in the R.H. display window.
(4) Momentarily press the "FRQ" or "FRQ/<->" pushbutton.	(a) The frequency of the ADF station appearing in the R.H. display window is transferred into the L.H. display window.
(5) On the ADF receiver, set the "BFO" pushbutton in pulled-out position.	
(6) Turn the "OFF/VOL" knob clockwise and set the audio volume to the desired level.	(a) The identification of the ADF station sounds in the headset. <u>With KI 227-00/01 indicator</u> (b) The simple bar pointer of ADF indicator is located at 90° to the right of the lubber line. <u>With RMI KI 229 indicator</u> (b) The simple bar pointer of RMI indicator is located at 90° to the right of the lubber line. <u>With RMI KNI 582 indicator</u> (b) The bar pointers of RMI indicator are located at 90° to the right of the lubber line.
(7) On the ADF receiver, set the "BFO" pushbutton in pushed-in position.	(a) "BFO" message appears. (b) A tone of 1 KHz sounds in the headset.
(8) On the ADF receiver, set the "BFO" pushbutton in pulled-out position.	

ACTION

RESULT

- (9) On the ADF receiver, set the "ADF" pushbutton in pushed-in position.

- (a) "ADF" message appears.

Aircraft with RMI KI 229 indicator

- (b) On the RMI, the dual bar pointer shows the bearing relative to the selected ADF station.

Aircraft with ADF KI 227-00 indicator

- (b) On the ADF indicator, the single bar pointer shows the direction of the selected ADF station.

Aircraft with ADF KI 227-01 indicator

- (b) On the ADF indicator, the single bar pointer shows the bearing relative to the selected ADF station.

Aircraft with RMI KNI 582 indicator

- (b) On the RMI, the bar pointers show the bearing relative to the selected ADF station.

- (10) On the ADF receiver, momentarily press the "FLT/ET" pushbutton.

- (a) "FLT" or "ET" message appears.

NOTE : If "ET" message appears, momentarily press the "FLT/ET" pushbutton.

- (b) "FLT" message appears

- (c) The R.H. display window shows the time elapsed since the ADF receiver energization.

- (11) On the ADF receiver, momentarily press the "FLT/ET" pushbutton.

- (a) "ET" message appears.

- (12) On the ADF receiver, momentarily press the "SET/RST" pushbutton.

- (a) On the ADF receiver, the elapsed time counter is set to zero and the timing starts.

- (13) On the ADF receiver, momentarily press the "SET/RST" pushbutton and hold it during two seconds.

- (a) "ET" message flashes.

- (14) When the "ET" message flashes, enter the duration 59 : 59 on the elapsed time counter with the concentric knobs.

- (a) The R.H. display window shows 59 : 59.

- (15) Momentarily press the "SET/RST" pushbutton.

- (a) The elapsed time counter starts the countdown.

- 18) Set the radio master switch to "OFF".

- 19) Disconnect the headset from the pilot connection jacks.

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- 20) Open main switch-breaker.
- 21) Disconnect the ground power unit - refer to 24-40-00.

E35 / E15 ADF ANTENNA

MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - ADF ANTENNA (Figure 201)

NOTE : This procedure applies to ADF1 and ADF2 installations.

A. Tools and consumable materials

- Sealant (TB 09-903)
- Plastic scraper
- Clean lintfree cloths
- Cleaning agent (TB 11-003)
- Blanking caps and plugs

B. Removal of ADF antenna

- 1) Make sure that the main switch-breaker is open.
- 2) If a sealant bead is applied around the antenna, remove the sealant with a plastic scraper.
- 3) Hold ADF antenna (3) and remove the two screws (4).
- 4) Sufficiently clear ADF antenna (3) to reach connector (1).

NOTE : Exercise care to avoid damaging lugs (6) ensuring ADF antenna bonding.

- 5) Disconnect connector (1).
- 6) Remove ADF antenna (3).
- 7) Blank off ADF antenna (3) connector.
- 8) If necessary, remove any sealant residues on ADF antenna and on the fuselage.

C. Installation of ADF antenna

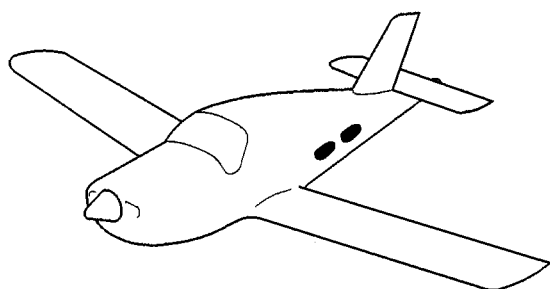
- 1) Make sure that the main switch-breaker is open.
- 2) Clean the portion of the fuselage in contact with the antenna with a cloth moistened with cleaning agent (TB 11-003). Wipe with a clean lintfree cloth.
- 3) Check the condition of gasket (2) bonded on ADF antenna (3). Replace if necessary.
- 4) Remove the blanking cap.
- 5) Connect connector (1).
- 6) Position ADF antenna (3) on support (5).
- 7) Position and secure screws (4).
- 8) Apply a bead of sealant (TB 09-903) around ADF antenna. Smooth the bead.
- 9) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 10) Perform an operational test of the Automatic Direction Finder (ADF) - refer to 34-54-00.

AAAA

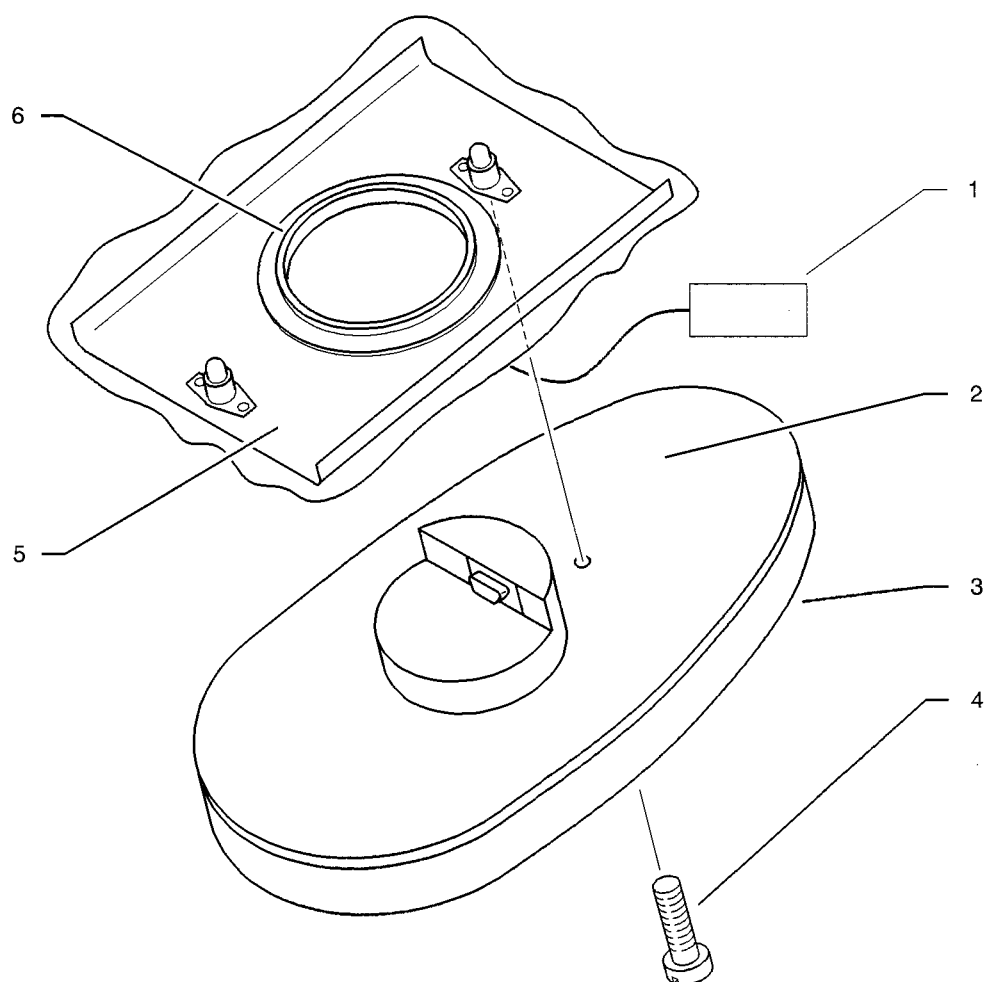
Validity : KR 87

34-54-05 (BA)

Page 201
JUN 04



- 1 - Connector
- 2 - Gasket
- 3 - ADF antenna
- 4 - Screw
- 5 - Support
- 6 - Lugs



ADF antenna - Removal / Installation
Figure 201

14345400AAAAGWZ14100

AAAA
Validity : KR 87

34-54-05 (BA)

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FEB 00

DME INSTALLATION**DESCRIPTION AND OPERATION****1. GENERAL (Figures 1, 1A and 1B)**

The DME is a short- and middle-range radio-navigation aid. It determines the slant-range distance by measuring the time required for the signal to reach the ground transmitter and return back to the aircraft. It also provides the aircraft ground speed and the time-to-station.

The optional DME installation consists of :

- an A72 DME interrogator,
- an M72 DME indicator,
- an E37 DME antenna.

A desensitization line connects the optional transponder to the DME interrogator.

The system sends an audio signal to A50 audio control box - refer to 23-11-00.

The system receives data from NAV 1 installation and from NAV 2 installation. It also sends data to NAV 1 installation and to NAV 2 installation - refer to 34-51-00 and 34-52-00.

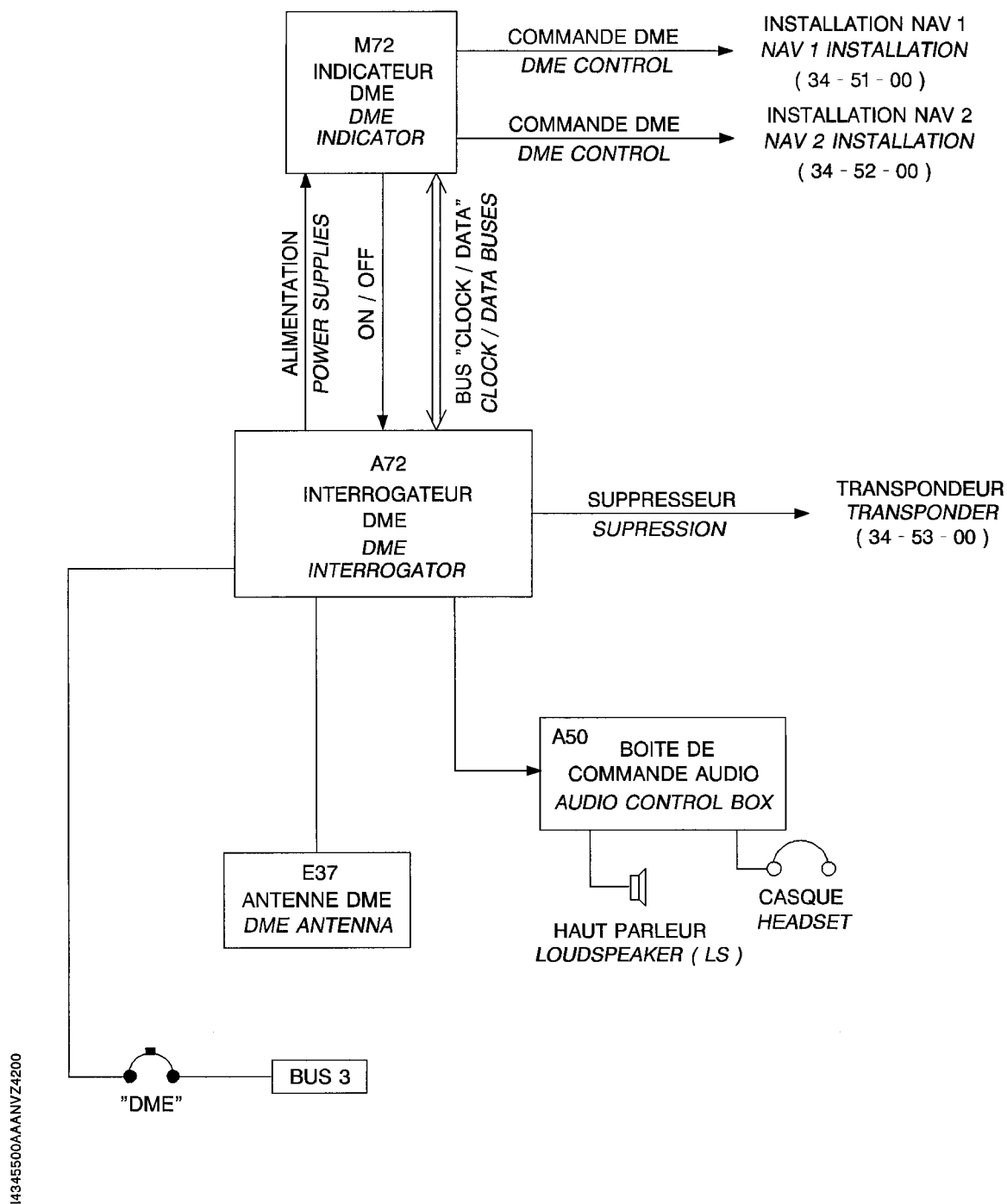
The system is electrically supplied by "BUS 2" bar via the "DME" circuit breaker.

2. LOCATION (Figure 2)

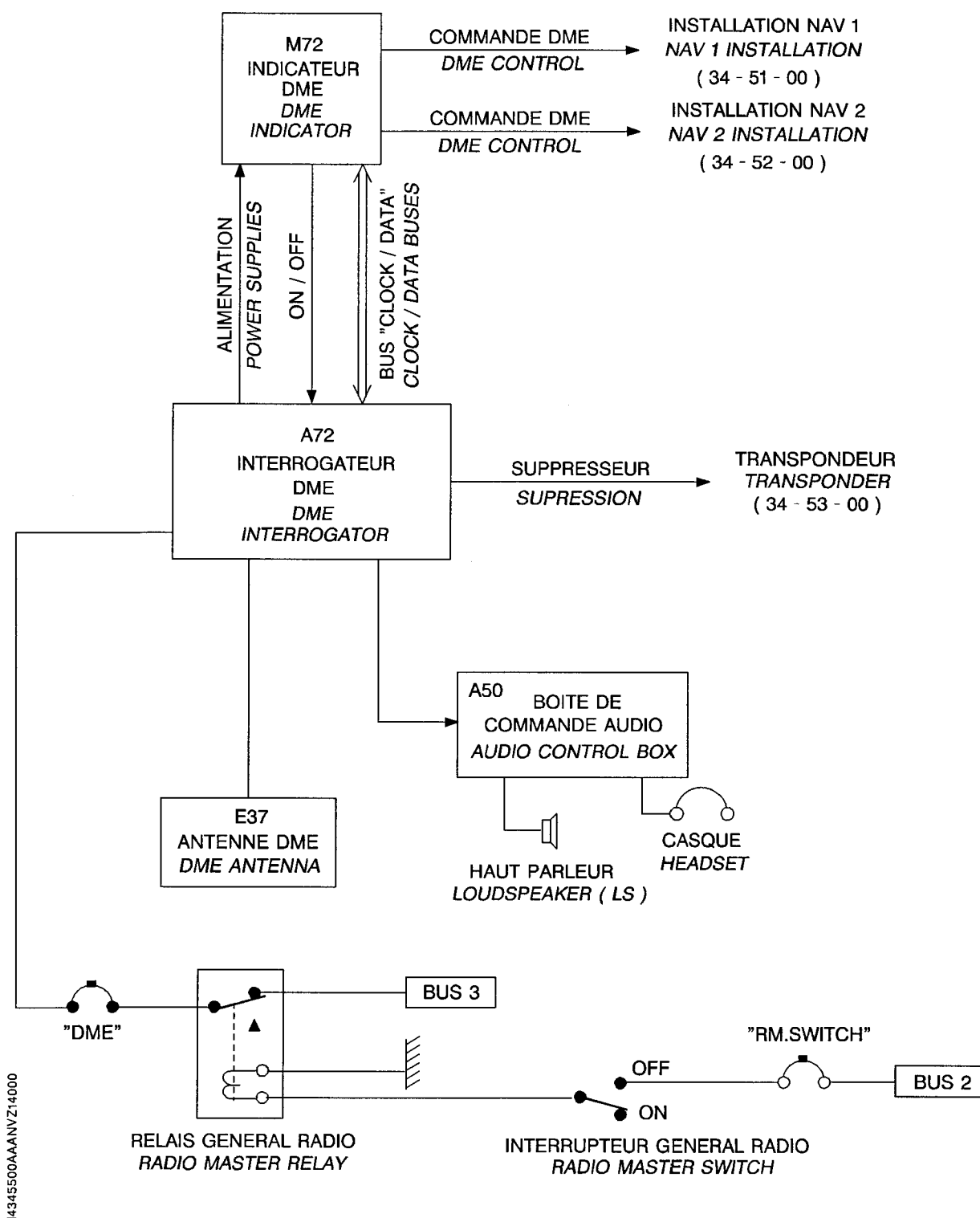
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A72 DME interrogator	1	230	Under R.H. front seat	34-55-00
M72 DME indicator	1	250	/	34-55-00
E37 DME antenna	1	210	/	34-55-03
Circuit breaker : - CB 89 "DME"	1	230	232L	WM

3. OPERATION

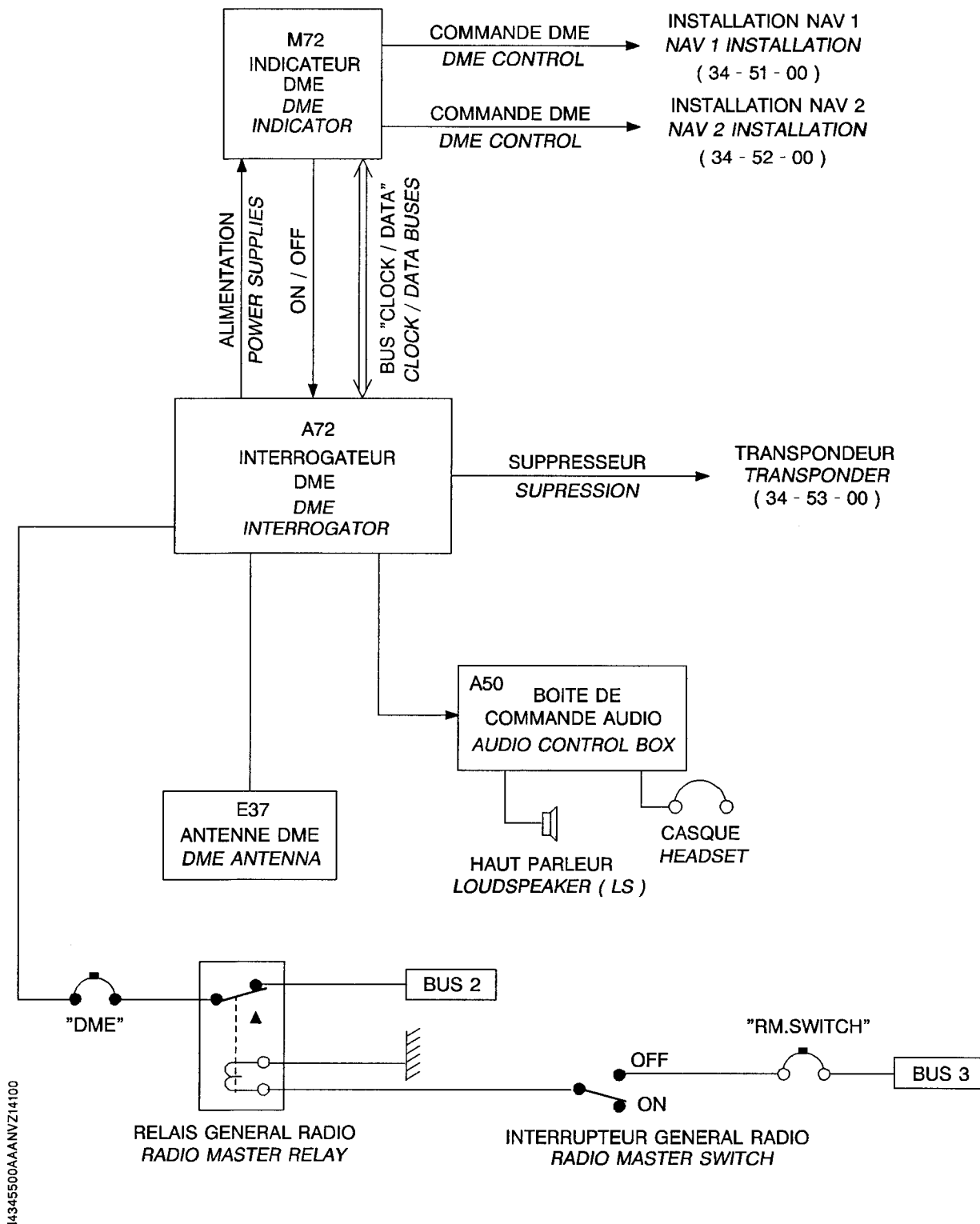
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



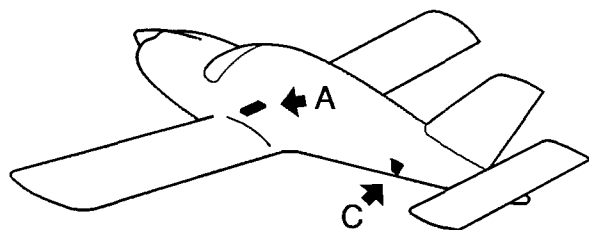
DME installation - Electrical schematic
Figure 1 - 14 volts without radio master



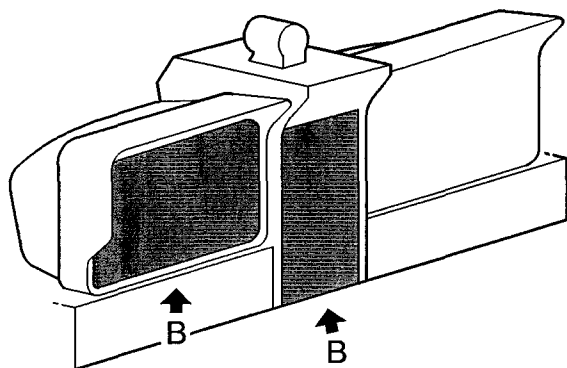
DME installation - Electrical schematic
Figure 1A - 14 volts with radio master



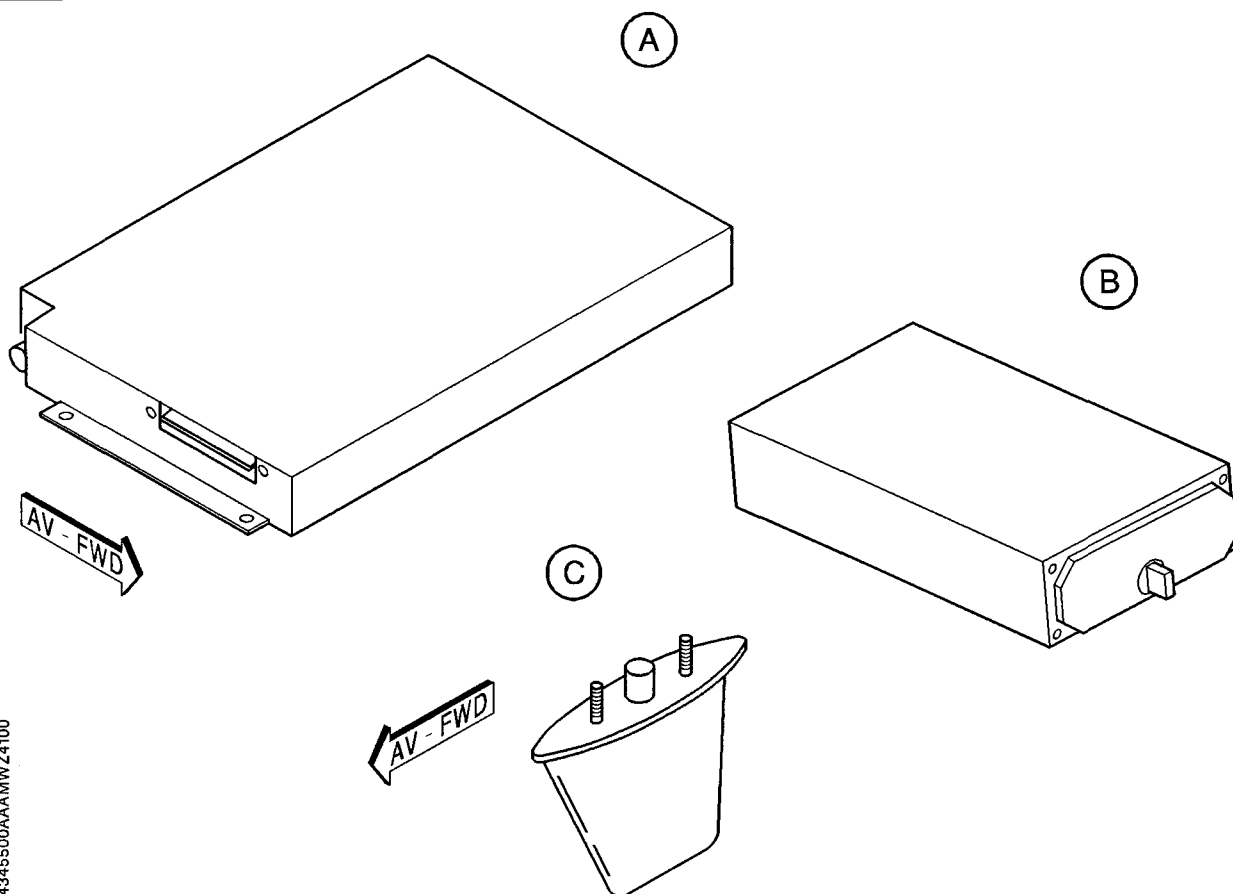
DME installation - Electrical schematic
Figure 1B - 28 volts with radio master



- A - A72 DME interrogator
- B - M72 DME indicator
- C - E37 DME antenna



 Variante de localisation
Alternate location



14345500AAAAMWZ4100

DME installation - Identification and location of components
Figure 2

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DME INSTALLATION

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The DME is a short- and middle-range radio-navigation aid. It determines the slant-range distance by measuring the time required for the signal to reach the ground transmitter and return back to the aircraft. It also provides the aircraft ground speed and the time-to-station.

The optional DME installation consists of :

- an A72 DME interrogator,
- an E37 DME antenna.

A desensitization line connects the optional transponder to the DME interrogator - refer to 34-53-00.

The system sends an audio signal to A50 audio control box - refer to 23-11-00.

The system receives data from NAV 1 installation. It also sends data to NAV 1 installation - refer to 34-51-00.

If the DME interrogator is installed in conjunction with KNS 81 integrated navigation system, the system uses the DME warning indicator - refer to 34-51-00.

■ The system is electrically supplied by "BUS 2" bar.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A72 DME interrogator	1	251C	/	34-50-00
E37 DME antenna	1	210	/	34-55-03
Circuit breaker : - CB 89 "DME"	1	230	232L	WM

3. DESCRIPTION

A. A72 DME interrogator

A72 DME interrogator measures the slant range distance (line of sight) from the aircraft to a ground station and computes the groundspeed and the time-to-station. It displays distance, groundspeed and time-to-station. Its operating frequency range is 108.00 to 117.95 MHz over 200 channels.

On its front panel, the interrogator features :

- an "OFF" switch for energization,
- a mode "RMT - FREQ - GS/T" selector,
- two concentric knobs to select the displayed frequency in "FREQ" mode :
 - . the outer knob increases or decreases the frequency in increments of 1 MHz,
 - . the inner knob, when pushed in, increases or decreases the frequency in increments of 0.1 MHz,
 - . the inner knob, when pulled out, adds 0.05 MHz to the displayed frequency and increases or decreases the frequency in increments of 0.1 MHz.

AFAP

Validity : KN 62A - KN 62A SC+ / KN 64A - KN 64A SC+

34-55-00 (CE)

Page 1
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- a display to indicate, in RMT and GS/T modes, distance, speed and time data, and, in FREQ mode, distance and frequency data.

The DME interrogator contains the circuits required to interrogate a DME ground station and to compute the slant range distance to the station.

The maximum range of A72 DME interrogator is 389 Nautical Miles but this depends on several factors, the most important being the altitude of the aircraft. The DME interrogator transmits coded interrogation signals (pulse pairs) to the ground station. The ground station receives the interrogation, delays (50 μ s) and returns a coded reply signal (pulse pairs) for each interrogation. The DME interrogator uses the time elapsed between the interrogation and the reply to compute the distance to the ground station.

A72 DME interrogator is electrically supplied by "BUS 2" bar via CB 89 "DME" circuit breaker.

A72 DME interrogator is mounted in PL30 radio rack.

B. E37 DME antenna

DME antenna is a blade antenna which provides frequency coverage over 950 to 1260 MHz (L band).

DME antenna is attached under the fuselage within the aircraft centerline between C4 and C5 frames.

4. OPERATION

RMT-FREQ-GS/T mode selector permits tuning A72 DME interrogator to NAV 1 system or to internal frequency. When the selector is set to "RMT", the frequency information from the NAV 1 system is applied to the DME interrogator. When the selector is set to "FREQ", DME interrogator is tuned to visualised frequency. DME interrogator sends a suppression pulse to the transponder during the transmission. The suppression pulse prevents system interference. A72 DME interrogator transmits a pulse coded interrogation signal that actuates a corresponding ground station reply. A72 DME interrogator computes distance, groundspeed and time-to-station.

When the A72 DME interrogator is locked to the ground station, the reply signal is received and processed by the A72 DME interrogator. The identification signal is decoded in A72 DME interrogator and applied to A50 audio control panel.

A. DME interrogator in remote "RMT" mode

This mode permits DME interrogator operation tuned to NAV 1 system.

The distance, the groundspeed and the time-to-station are displayed on the DME interrogator.

B. DME interrogator in frequency "FREQ" mode

This mode permits the DME interrogator operation on an internal frequency selected via the concentric knobs of the DME interrogator.

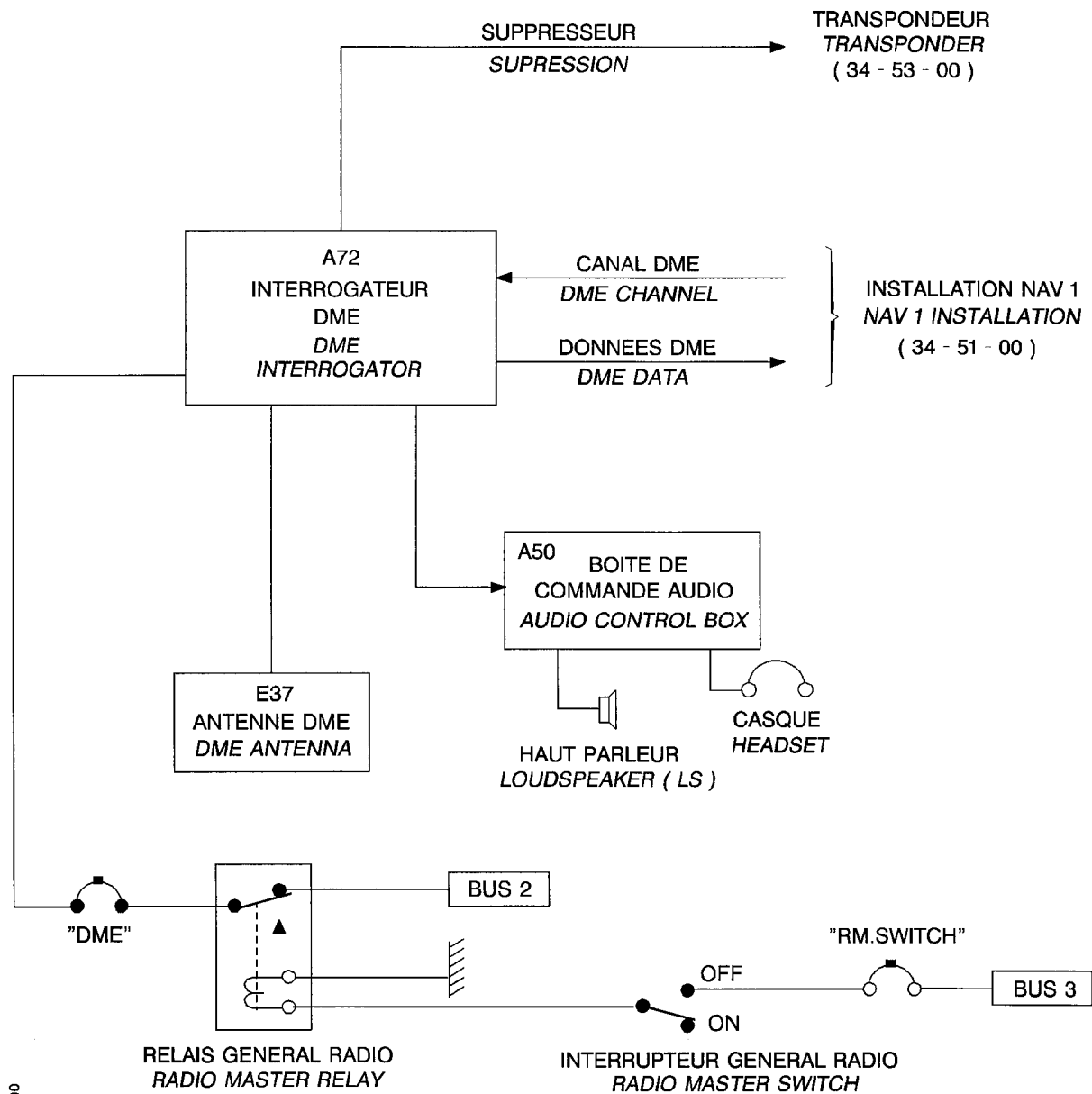
The distance and the frequency are displayed on the DME interrogator.

C. DME interrogator in groundspeed/time-to-station "GS/T" mode

This mode permits locking the DME interrogator to the last frequency selected in "FREQ" mode.

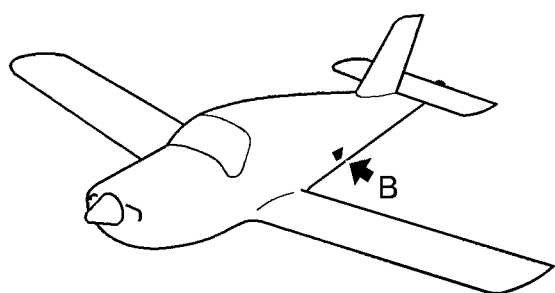
The distance, the groundspeed and the time-to-station are displayed on the DME interrogator.

To prevent the display of false information (when the DME interrogator is not locked to the ground station or during energization), the DME interrogator shows dashes, in this case, just reset the system by switching to "RMT" mode or to "FREQ" mode.

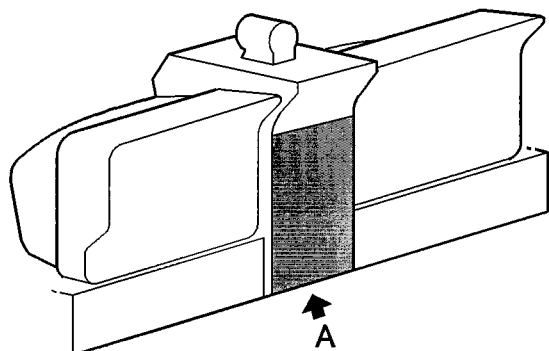


I4345500AAANVZ24000

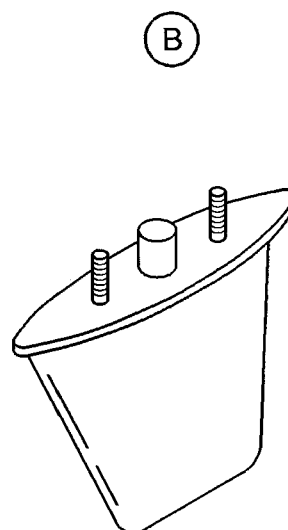
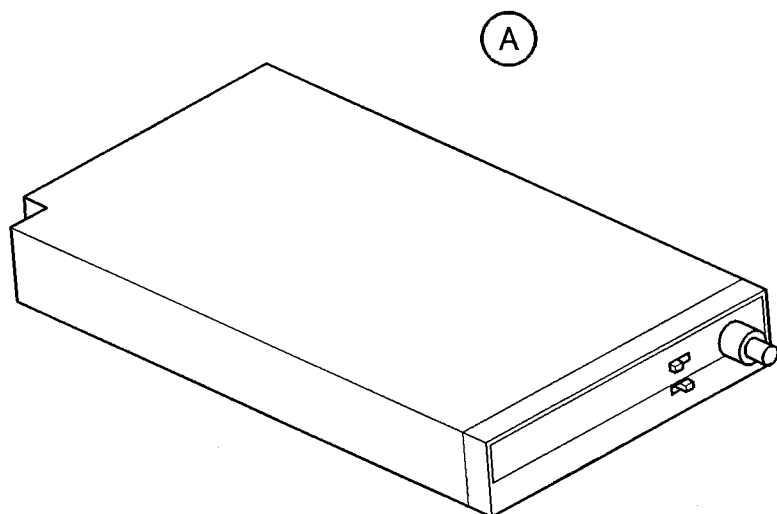
DME installation - Electrical schematic
Figure 1



- A - A72 DME interrogator
- B - E37 DME antenna



 Variante de localisation
Alternate location



DME installation - Identification and location of components
Figure 2

14345600AAA/WZ5001

E37 DME ANTENNA

MAINTENANCE PRACTICES

1. SERVICING

None

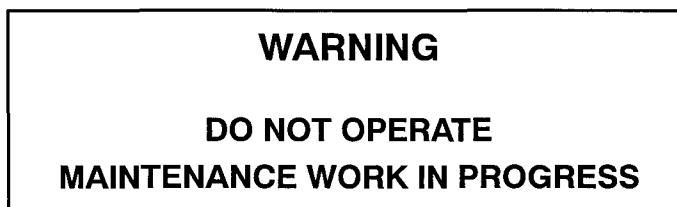
2. REMOVAL / INSTALLATION - E37 DME ANTENNA (Figure 201)

A. Tools and consumable materials

- Sealant (TB 09-903)
- Sealant (TB 08-004B)
- Plastic scraper
- Clean lintfree cloth
- Cleaning agent (TB 11-912)
- Alodine (TB 13-002)
- Varnish (TB 07-906)
- Abrasive cloth (TB 05-916C)
- Adhesive tape

B. Removal of E37 DME antenna

- 1) Make sure that the main switch-breaker is open.
- 2) Install the warning sign prohibiting the control wheel operation :



- 3) If a sealant bead is applied around the antenna, remove the sealant with a plastic scraper.
- 4) Remove under-hull cowlings 218 or 218F and 218A.
- 5) At frame C4, disconnect the elevator and rudder interconnection rods. Retain bolts, washers and nuts. Discard the cotter pins.

NOTE : Disconnecting the interconnection rods is not mandatory, it makes access to the antenna easier.

- 6) On frame C4, through the interconnection rods holes, disconnect connector (1).
- 7) Remove nuts (2) and washers (3). Discard the nuts.

Antenna installed with conductive sealant

- 8) Carefully unstick and remove antenna (6).
- 9) Using the plastic scraper, remove any sealant residues on the fuselage and the antenna.

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Validity : OPTION

34-55-03

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NOV 01

Antenna installed without conductive sealant

- 8) Remove antenna (6) and discard gasket (7) if installed.

C. Installation of E37 DME antenna

- 1) If the skin area in contact with the antenna base is not a non-painted alodine-coated surface, perform the following operations
 - a) Position the antenna on the skin and draw its contour using a soft lead pencil.
 - b) Using adhesive tape, delimit the skin area around the antenna base.
 - c) Using abrasive cloth (TB 05-916C), bare the skin area in contact with the antenna base.
 - d) Clean the bared area with a clean lintfree cloth moistened with cleaning agent (TB 11-912). Wipe with a dry cloth.
 - e) Coat the bared area with Alodine (TB 13-002).
 - f) Remove the adhesive tape.
- 2) Clean the skin area in contact with the antenna base with a clean lintfree cloth moistened with cleaning agent (TB 11-912). Wipe with a dry cloth.
- 3) Ensure bonding of areas (8) in contact with washers (3) – refer to 20-00-12.
- 4) Secure the antenna with new nuts (2) and washers (3).
- 5) Using a clean lintfree cloth moistened with cleaning agent (TB 11-912), clean the alodine-coated areas still visible. Wipe with a dry cloth.
- 6) Apply varnish (TB 07-906) on the attachment hardware and the alodine-coated areas still visible.

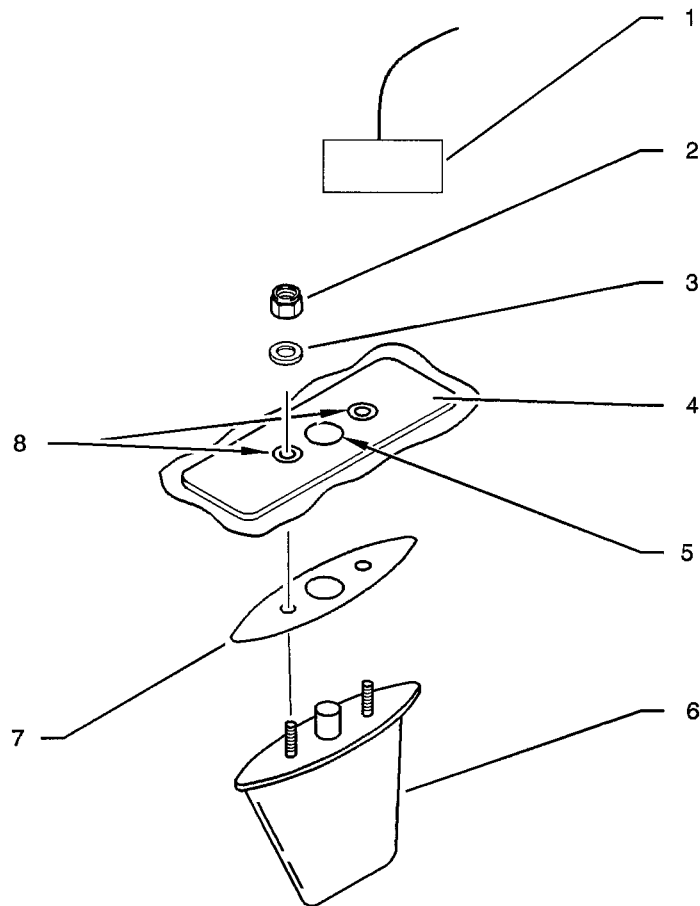
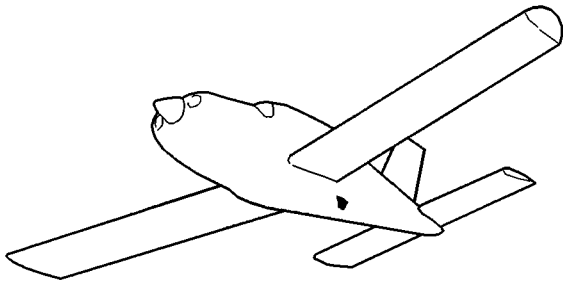
Antenna installed with counterplate (4)

- 7) Apply a bead of sealant (5) (TB 08-004B) around antenna connector.

All

- 8) Connect connector (1).
- 9) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 10) If disconnected, reconnect the elevator and rudder interconnection rods with the bolts, washers and nuts. Lock with new cotter pins.
- 11) Make sure the DME antenna cable does not interfere with the interconnection rods.
- 12) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 13) Install under-hull cowlings 218 or 218F and 218A.
- 14) Remove the warning sign prohibiting control wheel operation.
- 15) Apply a bead of sealant (TB 09-903) around the antenna. Smooth-finish the bead.
- 16) Perform a functional test of the system.

- 1 - Connector
- 2 - Nut
- 3 - Washer
- 4 - Counterplate
- 5 - Sealant bead
- 6 - Antenna
- 7 - Gasket
- 8 - Area to be bonded



DME antenna - Removal / Installation
Figure 201

I4342805AAACWZ4101

AAAA
Validity : OPTION

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which allows to solve the problem of an aircraft location anywhere (tridimensional positioning : latitude, longitude, altitude).

The optional system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- a J89 "data loader" jack,
- a removable database cartridge (mounted at the back of the GPS receiver).

The GPS also uses components of M6 advisory panel - refer to 31-50-01 :

- an "MSG - WRN - WPT" annunciator (in conjunction with a printed circuit board),
- or "WPT - WRN" and "MSG" annunciators.

The GPS also uses the "RADIO MASTER" switch.

The GPS gets altitude coding information from the encoding altimeter - refer to 34-11-00.

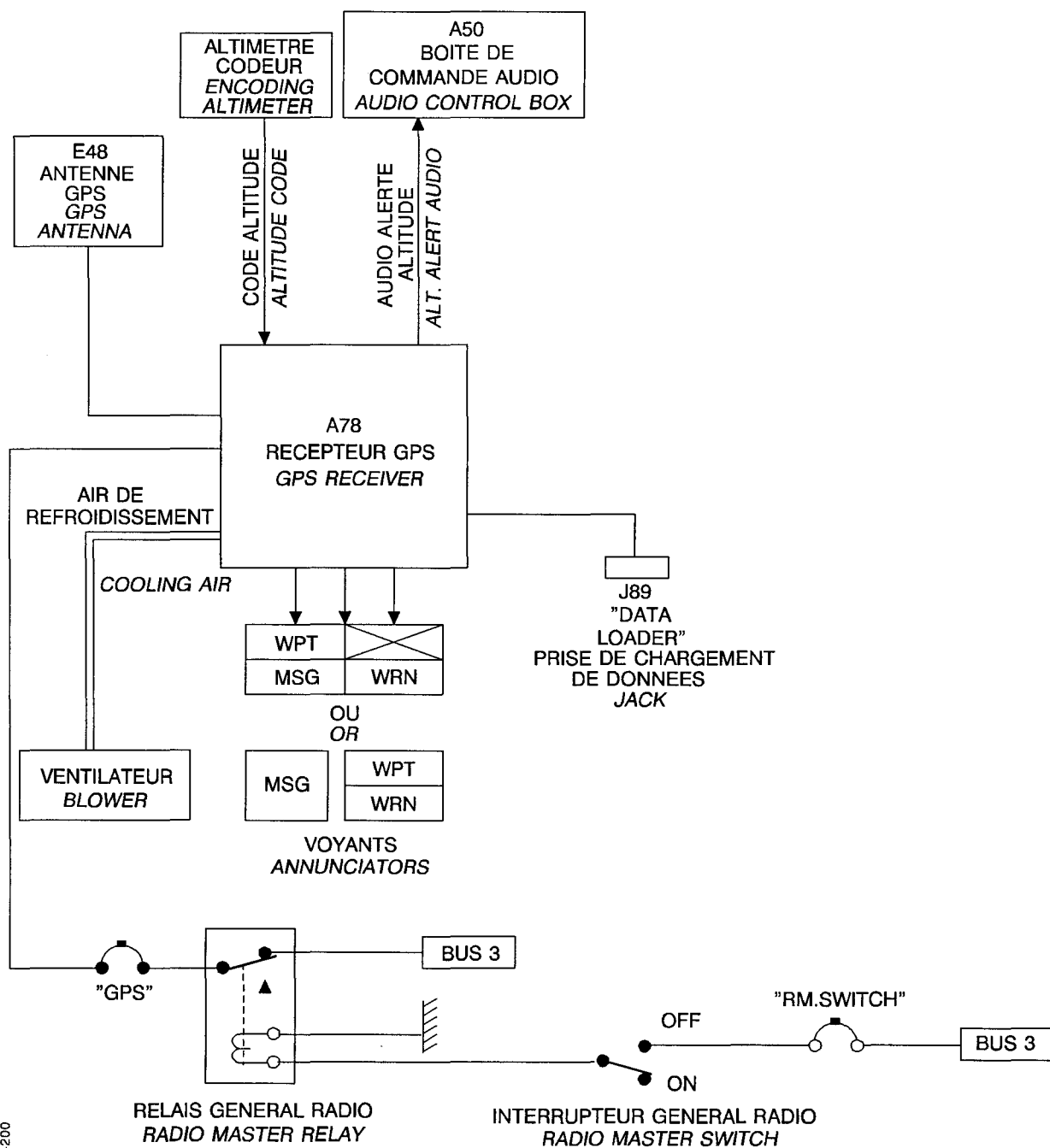
The GPS sends an altitude - alert audio signal to the audio control box - refer to 23-11-00.

The GPS also uses :

- an interface kit used to load the database from a personal computer via the data loader jack,
- the blower of the radio air cooling system.

VHF transmissions may affect GPS signal reception. Filters are inserted in line with each VHF transmission line.

The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.



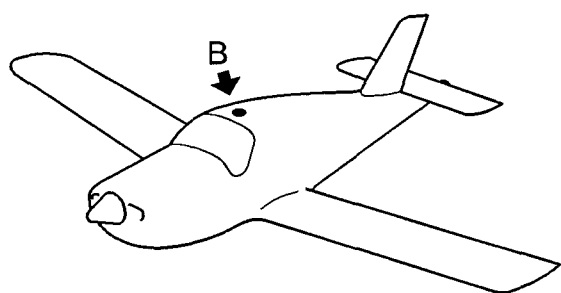
Global Positioning System (GPS) - Electrical schematic
Figure 1

2. LOCATION (Figures 2 and 3)

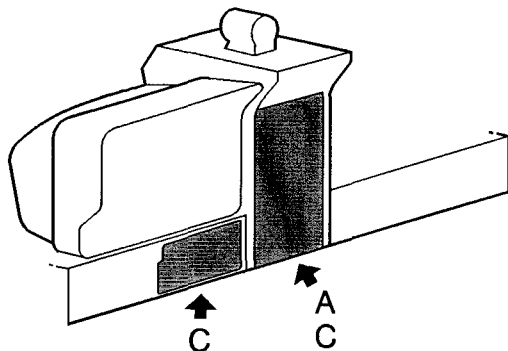
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-50-00
E48 GPS antenna	1	210	/	34-57-02
Filter	2	230	251L	34-57-00
Blower	1	230	211R	34-57-00
J89 "data loader" jack	1	254L or 254R or 251C	/	34-57-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

3. OPERATION

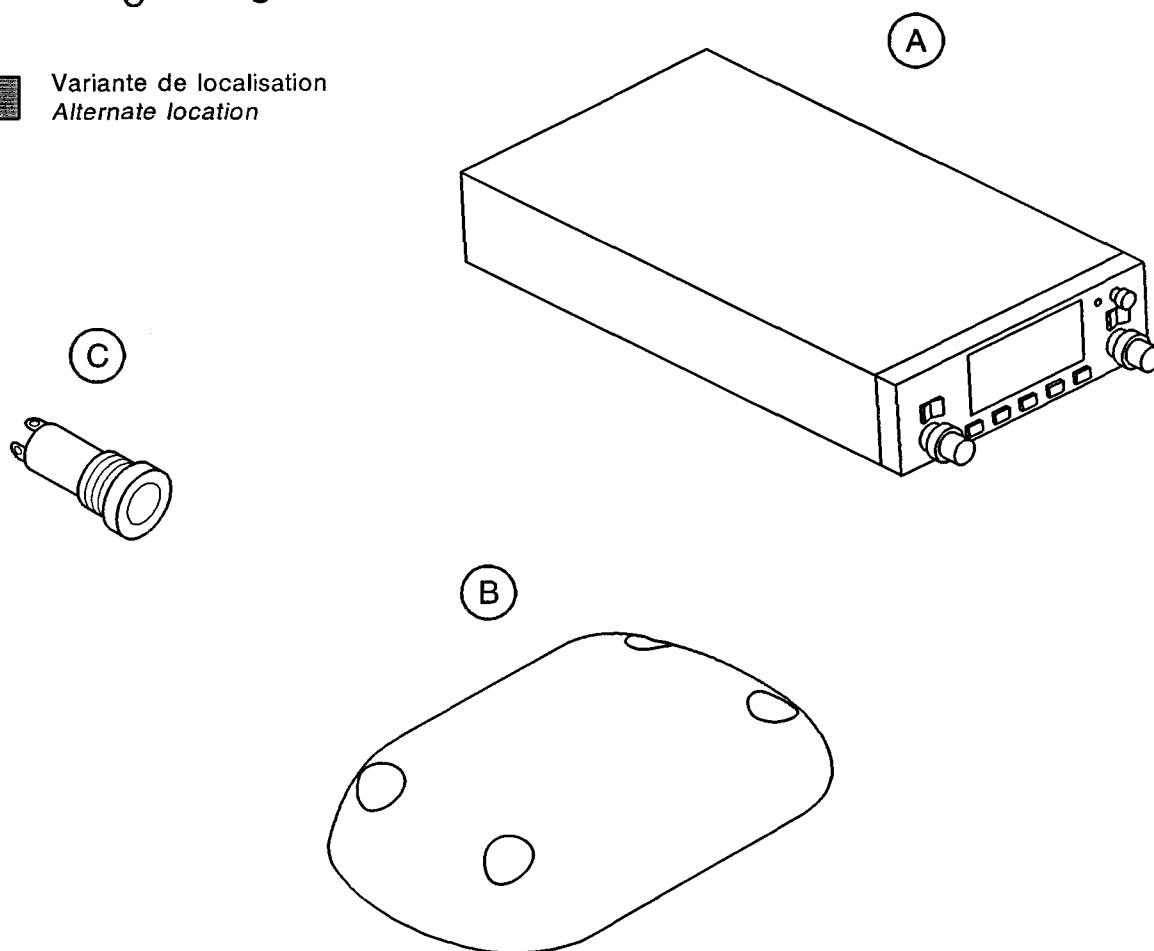
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



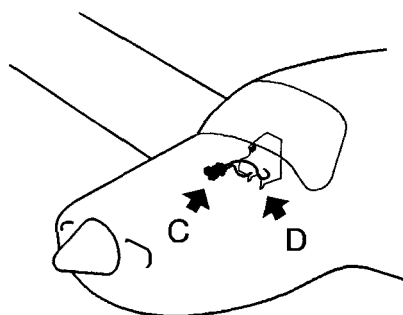
- A - A78 GPS receiver
- B - E48 GPS antenna
- C - J89 "data loader" jack



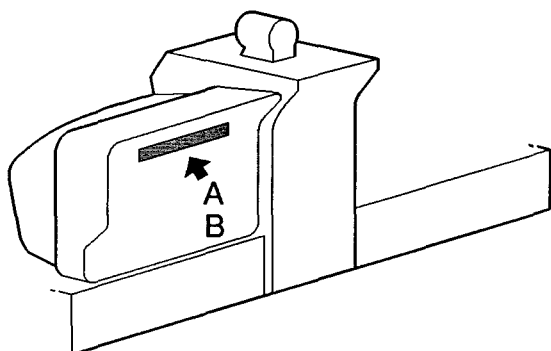
 Variante de localisation
Alternate location



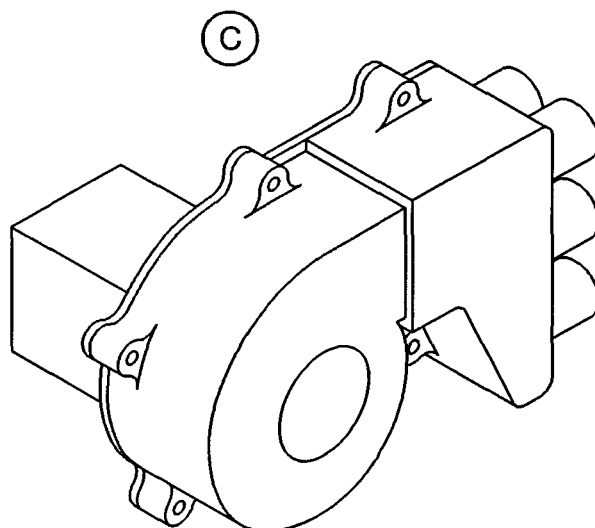
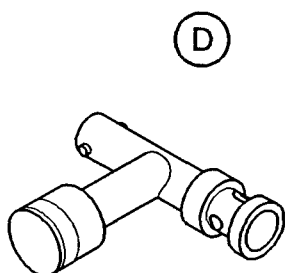
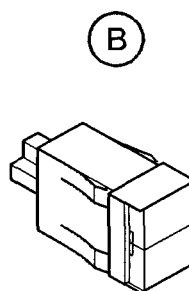
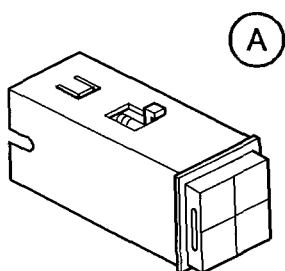
Global Positioning System (GPS) - Identification and location of components
Figure 2



- A - "MSG - WRN - WPT" annunciator
- B - "WPT - WRN" or "MSG" annunciator
- C - Blower
- D - Filter



 Variante de localisation
Alternate location



14345700AAAPVZ4100

Global Positioning System (GPS) - Identification and location of components
Figure 3

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which allows to solve the problem of an aircraft location anywhere (tridimensional positioning : latitude, longitude, altitude).

The optional system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- an E023 relay box,
- a J89 "data loader" jack,
- a removable database cartridge (mounted at the back of the GPS receiver).

The GPS also uses components of M6 advisory panel - refer to 31-50-01 :

- the switch / annunciator "NAV 1 - GPS",
- the annunciator "WPT / WRN",
- the annunciator "MSG",

The GPS also uses the "RADIO MASTER" switch.

The GPS gets altitude coding information from the encoding altimeter - refer to 34-11-00,

The GPS sends :

- an altitude - alert audio signal to the audio control box - refer to 23-11-00,
- guidance information to the optional autopilot system - refer to 22-12-00.

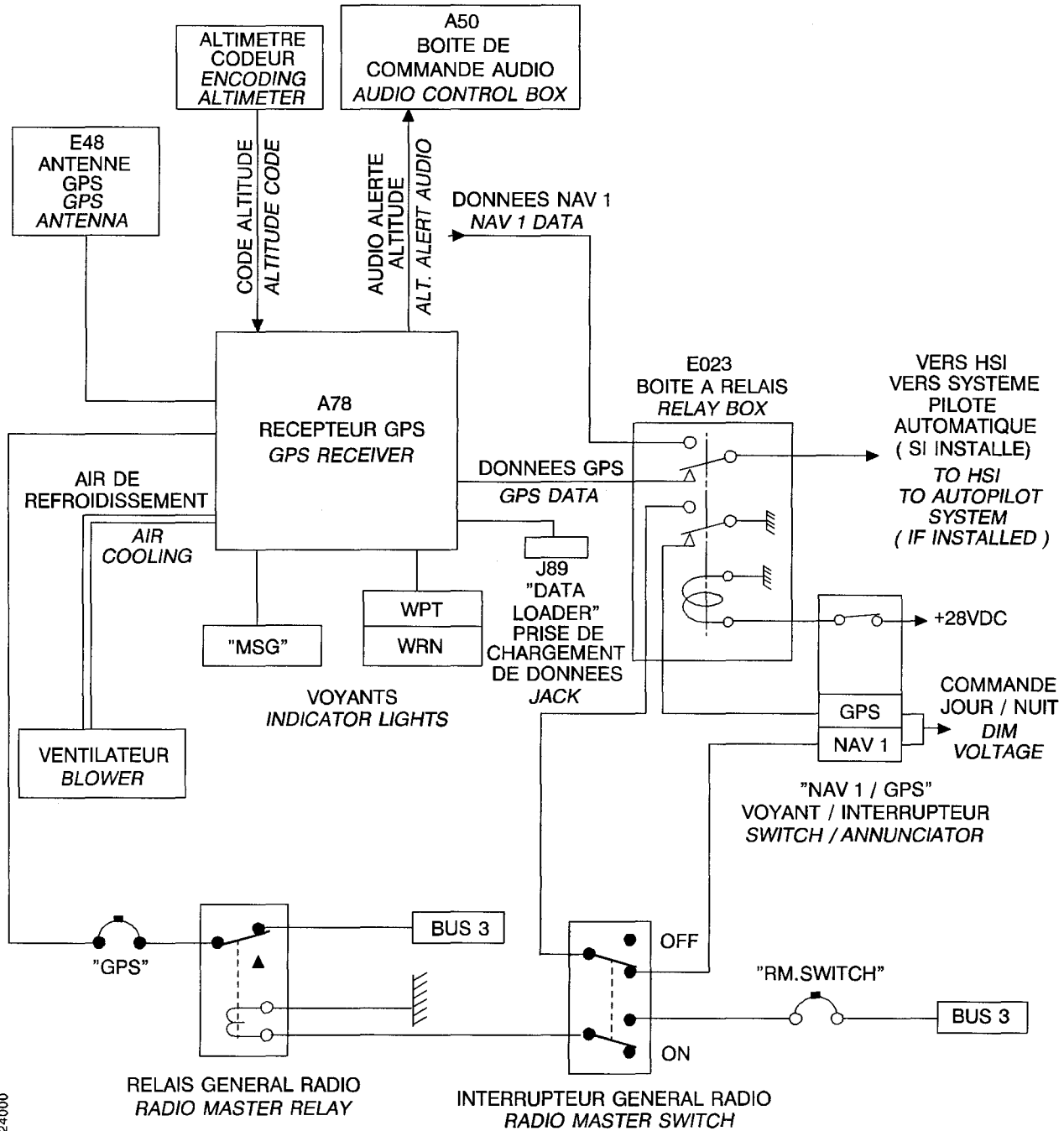
The GPS also uses :

- an interface kit used to load the database from a personal computer via the data loader jack,
- the blower of the radio air cooling system.

VHF transmissions may affect GPS signal reception. Filters are inserted in line with each VHF transmission line.

Using the switch / annunciator "NAV 1 - GPS" of M6 advisory panel, the remote relay box E023 provides switching of NAV 1 or GPS information to the horizontal situation indicator of the heading reference system - refer to 34-21-00.

The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.



Global Positioning System (GPS) - Electrical schematic
Figure 1

AFAF

Validity : KLN 90A with HSI
NAV 1 / GPS switching

34-57-00 (B)

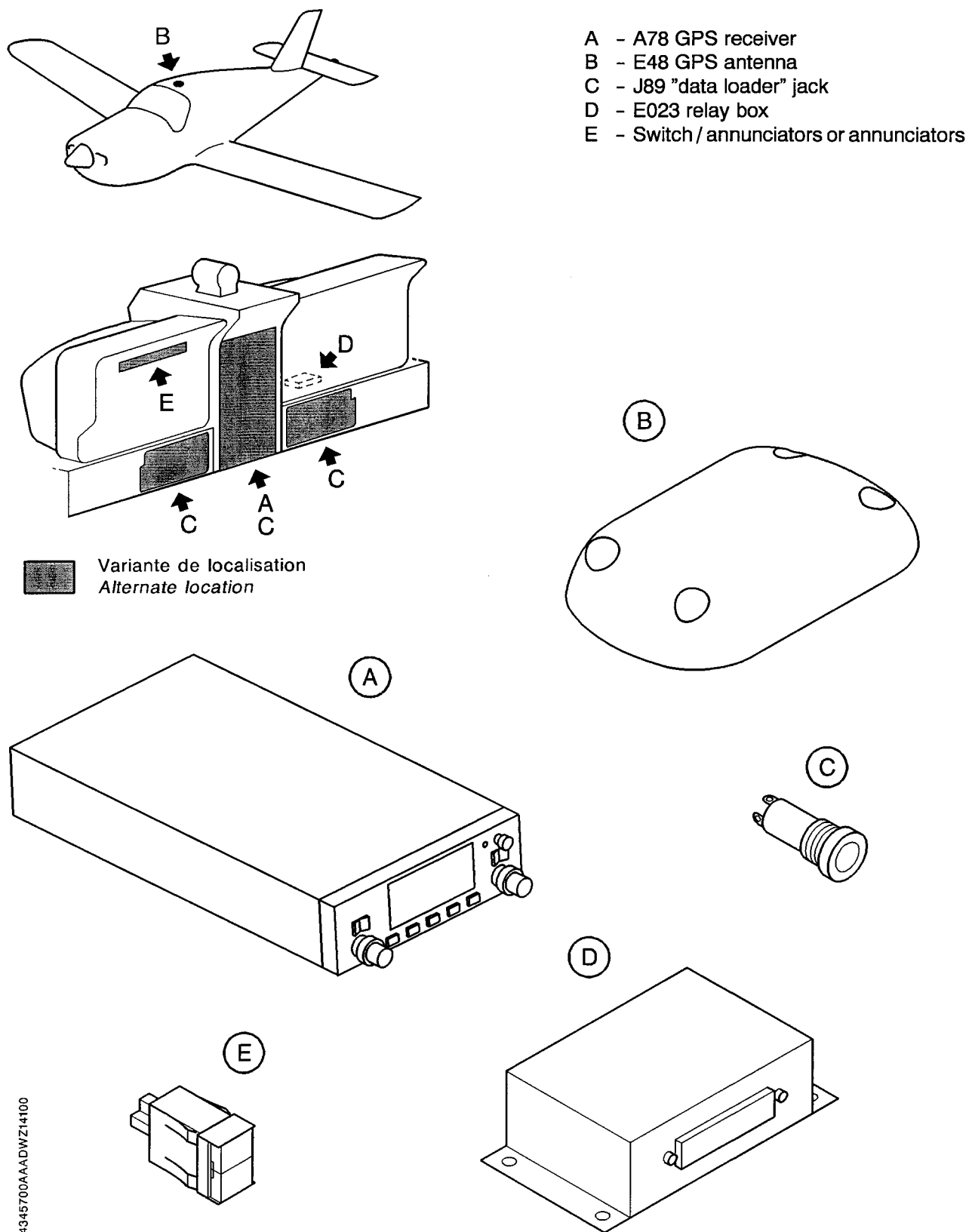
Page 2
FEB 00

2. LOCATION (Figures 2 and 3)

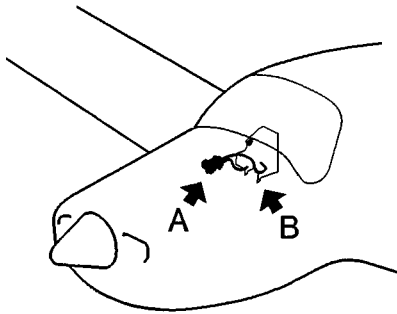
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-50-00
E48 GPS antenna	1	210	/	34-57-02
E023 relay box	1	250	Behind the R.H. instrument panel	34-57-05
Filter	2	230	251L	34-57-00
Blower	1	230	211R	34-57-00
J89 "data loader" jack	1	254L or 254R or 251C	/	34-57-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

3. OPERATION

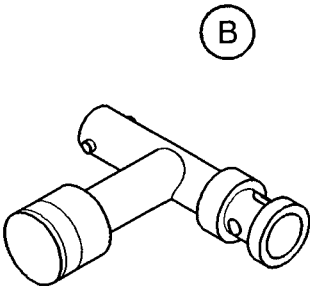
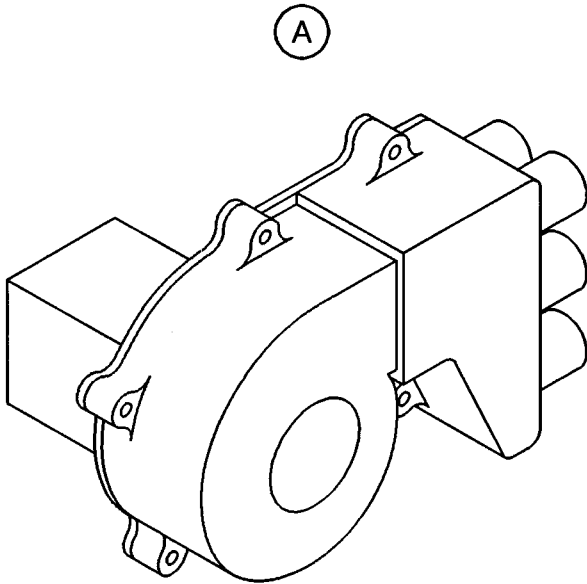
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



Global Positioning System (GPS) - Identification and location of components
Figure 2



A - Blower
B - Filter



14345700AAA PVZ4000

Global Positioning System (GPS) - Identification and location of components
Figure 3

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which makes it possible to solve the problem of an aircraft location anywhere.

The system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- an "MSG" annunciator (indicator light), located on M6 advisory panel.

The GPS receiver sends an audio signal to the audio control box – refer to 23-11-00.

This audio signal is attenuated by a resistor, located on BJ3 terminal strip of the radio rack.

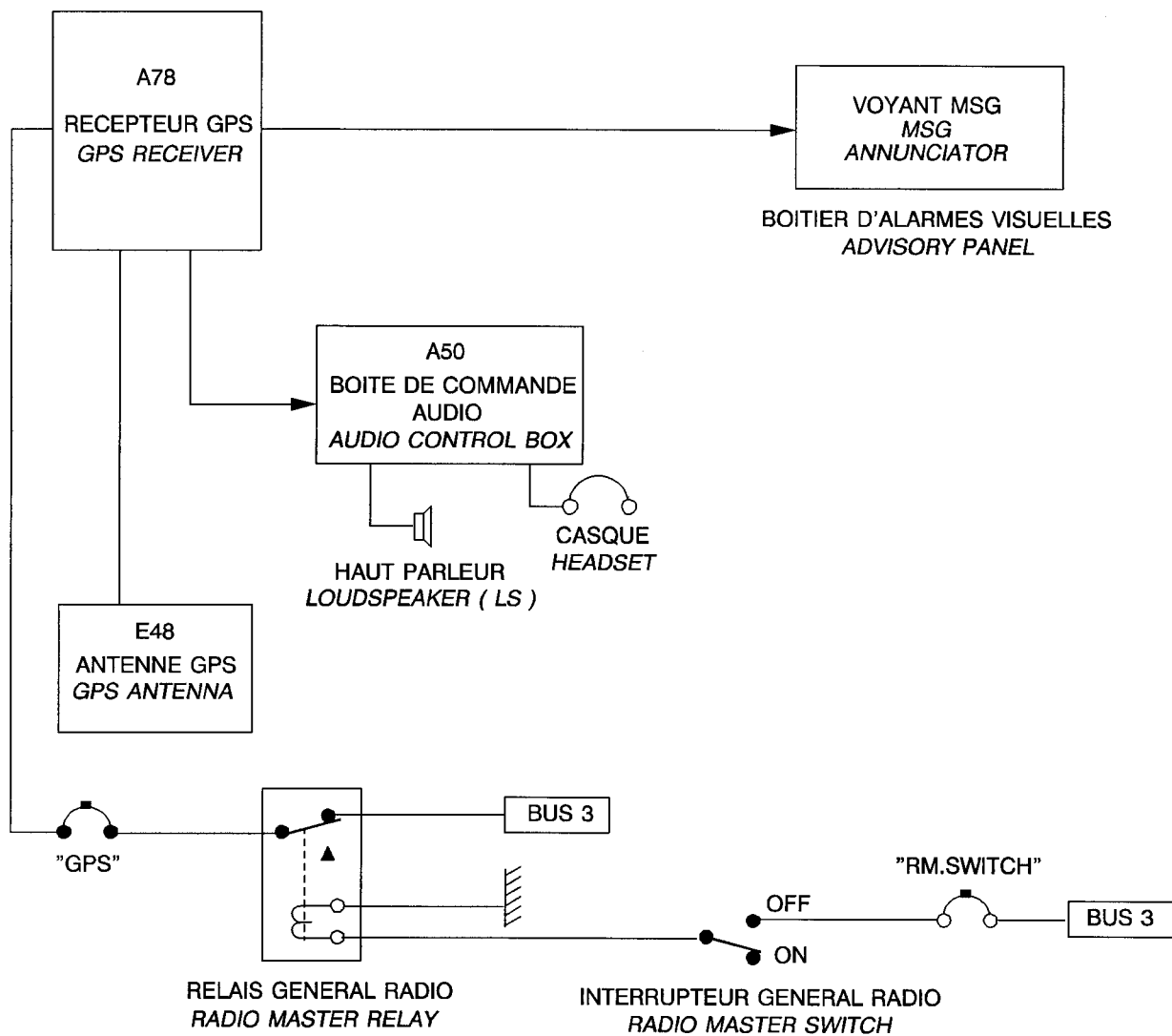
The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.

2. LOCATION (Figure 2)

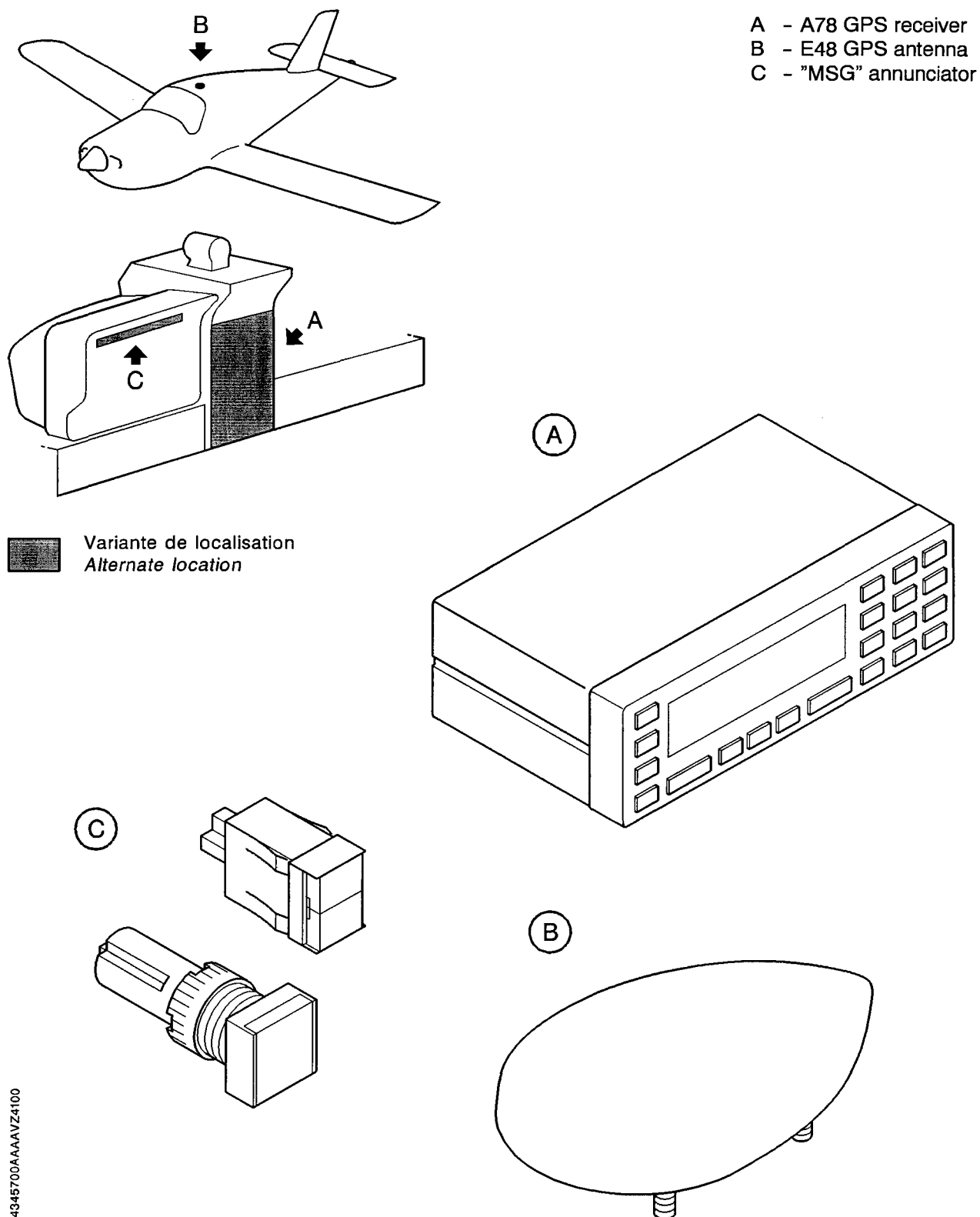
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-57-00
E48 GPS antenna	1	210	/	34-57-02
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



Global Positioning System (GPS) - Electrical schematic
Figure 1



Global Positioning System (GPS) - Identification and location of components
Figure 2

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which allows to solve the problem of an aircraft location anywhere.

The system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- a "NAV 1 / GPS" switch / annunciator of the advisory panel [controls the switching of NAV 1 (VOR / LOC) or GPS information on the HSI],
- an "MSG" annunciator (indicator light) of the advisory panel,
- an E023 relay box [switches NAV 1 (VOR) or GPS information on the HSI].

The GPS receiver sends an audio signal to the audio control box - refer to 23-11-00.

This audio signal is attenuated by a resistor located on BJ3 terminal strip of the radio rack.

The system also uses the "RADIO MASTER" switch.

The GPS receiver sends navigation data to the optional autopilot system - refer to 22-12-00.

The GPS receiver transmits the guidance information through the relay box (right / left, TO / FROM and Flag) to the HSI (heading reference system - refer to 34-21-00), if the pilot has previously selected the GPS information (using the "NAV 1 / GPS" switch / annunciator).

The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.

2. LOCATION (Figures 2 and 3)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-57-00
E48 GPS antenna	1	210	/	34-57-02
E023 relay box	1	250	Behind the R.H. instrument panel	34-57-05
Advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

3. OPERATION

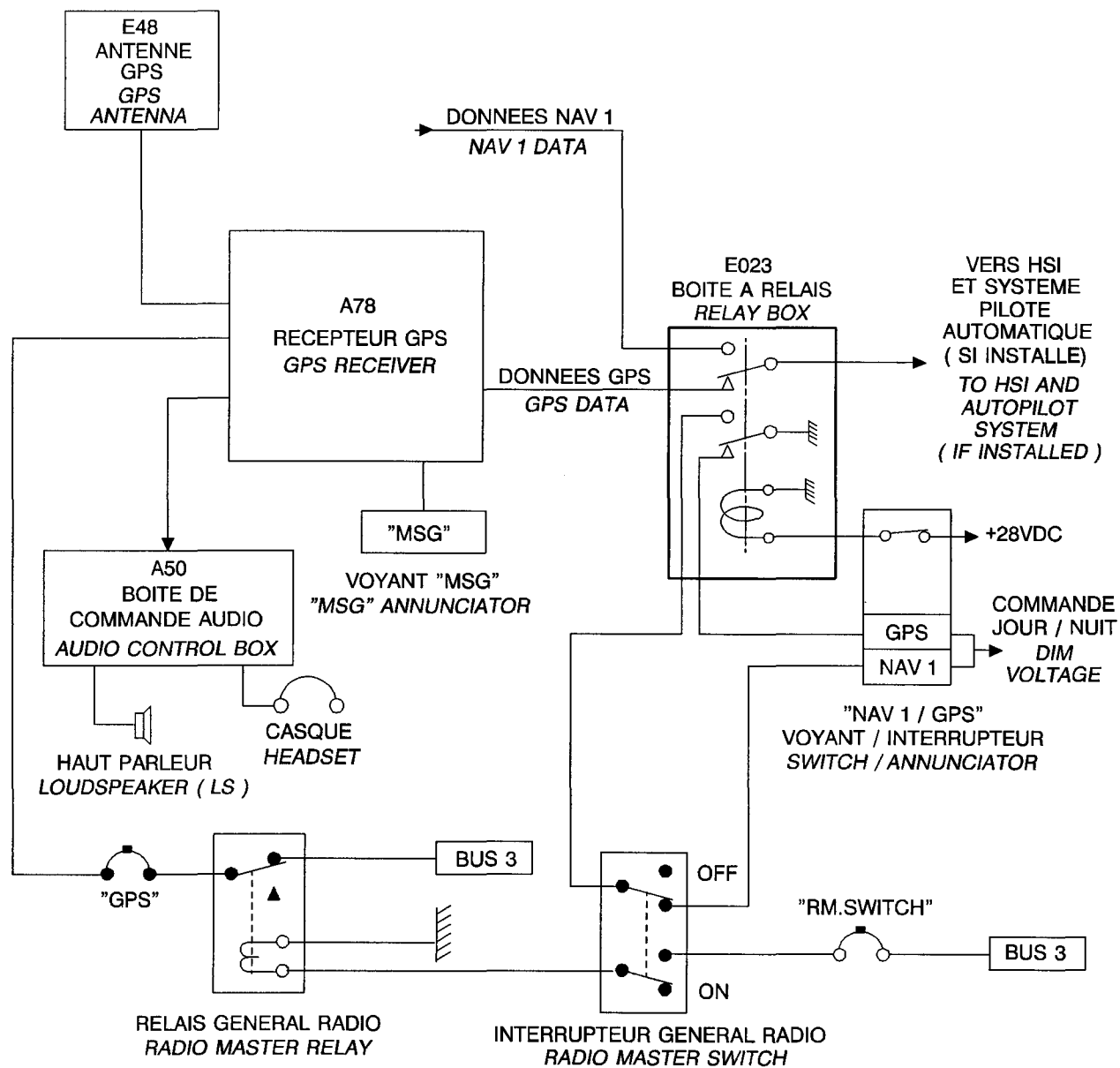
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

AIAI

Validity : GARMIN 100 with HSI
NAV 1 / GPS switching

34-57-00 (CM)

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FEB 00



I4345700A/BPW Z4100

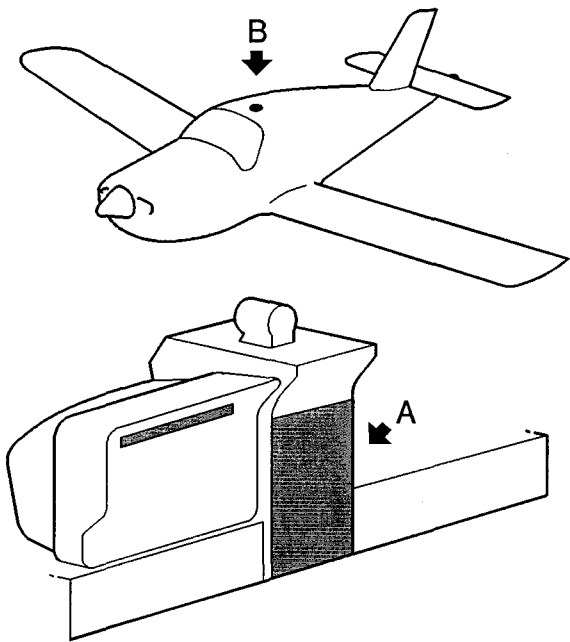
Global Positioning System (GPS) - Electrical schematic
Figure 1

AIAI

Validity : GARMIN 100 with HSI
NAV 1 / GPS switching

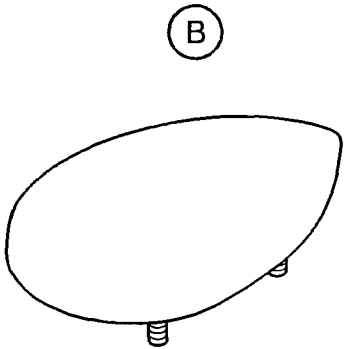
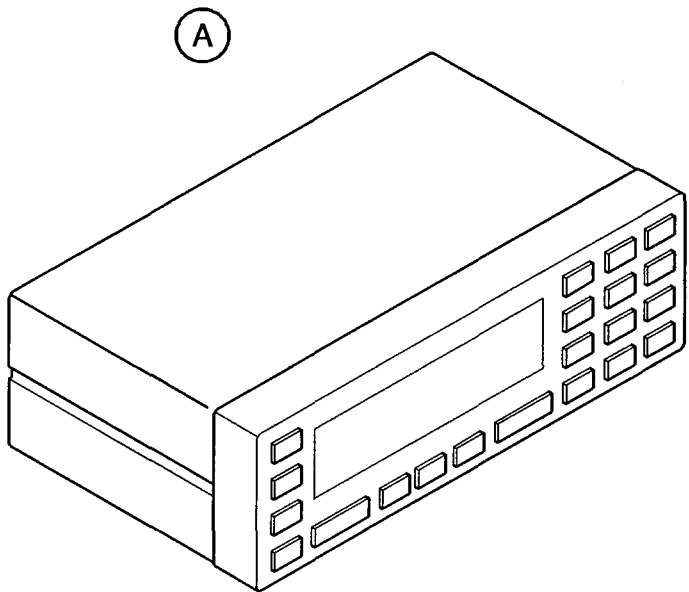
34-57-00 (CM)

Page 2
FEB 00



A - A78 GPS receiver
B - E48 GPS antenna

 Variante de localisation
Alternate location



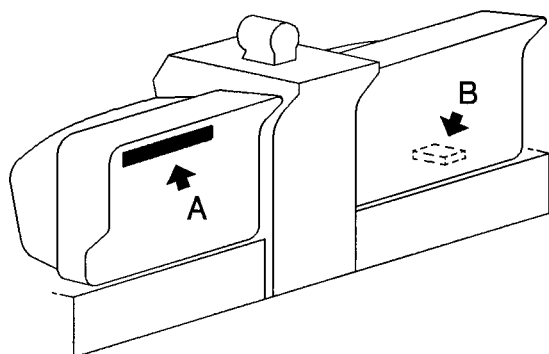
I4345700AAA/VZ4001

Global Positioning System (GPS) - Identification and location of components
Figure 2

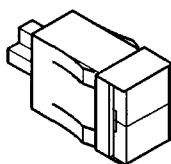
AIAI
Validity : GARMIN 100 with HSI
NAV 1 / GPS switching

34-57-00 (CM)

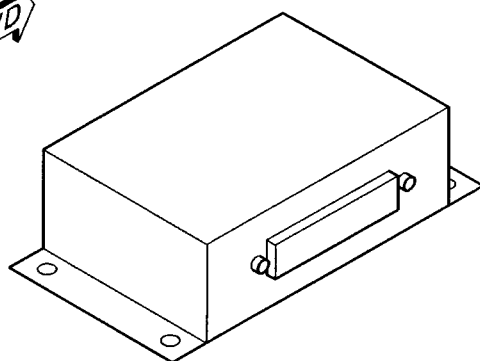
- A - Switch / annunciator or annunciators
- B - E023 relay box



(A)



(B)



14345700AAADWZ4100

Global Positioning System (GPS) – Identification and location of components
Figure 3

AIAI

Validity : GARMIN 100 with HSI
NAV 1 / GPS switching

34-57-00 (CM)

Page 4
FEB 00

GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which makes it possible to solve the problem of an aircraft location anywhere.

The system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- a removable database card,
- a "MSG / WPT" annunciator (indicator light), located on M6 advisory panel.

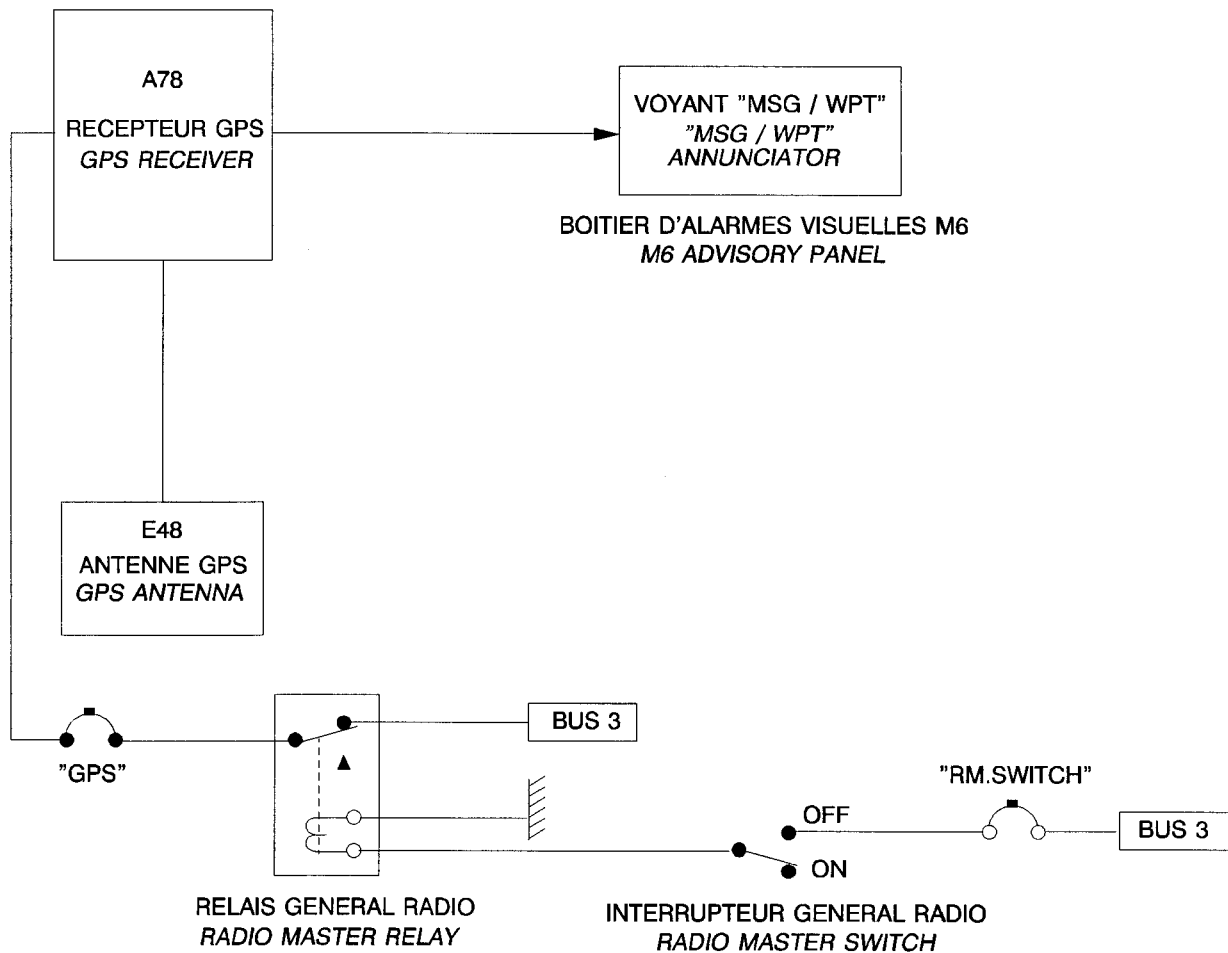
The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.

2. LOCATION (Figure 2)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-57-00
E48 GPS antenna	1	210	/	34-57-02
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

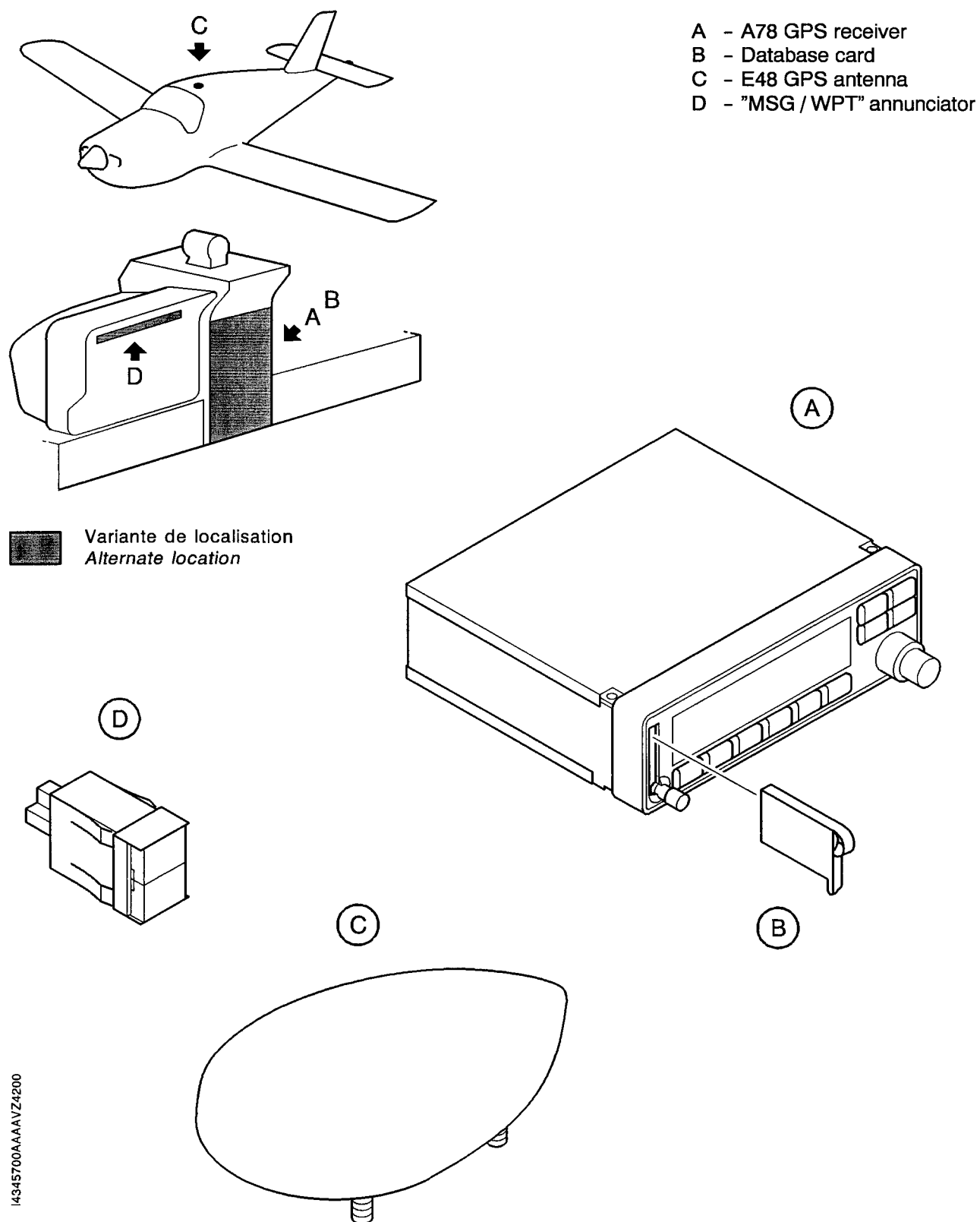
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



I4345700AABPWZ4200

Global Positioning System (GPS) - Electrical schematic
Figure 1



Global Positioning System (GPS) - Identification and location of components
Figure 2

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which allows to solve the problem of an aircraft location anywhere (tridimensional positioning : latitude, longitude, altitude).

The optional system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- an E023 relay box,
- an A92 relay box,
- a J89 "data loader" jack,
- a removable database cartridge (mounted at the back of the GPS receiver).

The GPS also uses components of M6 advisory panel - refer to 31-50-01 :

- the switch / annunciator "NAV 1 - GPS",
- the switch / annunciator "GPS CRS OBS - GPS CRS LEG",
- the switch / annunciator "GPS APR ARM - GPS APR ACTV",
- the annunciator "MSG - WPT",
- the K1 relay,
- two load resistors for NAV 1 receiver's OBS resolver.

The GPS also uses the "RADIO MASTER" switch.

The GPS gets :

- altitude coding information from the encoding altimeter - refer to 34-11-00,
- data from the optional SHADIN fuel flow system - refer to 73-30-00.

The GPS sends :

- an altitude - alert audio signal to the audio control box - refer to 23-11-00,
- guidance information to the optional autopilot system - refer to 22-12-00.

The GPS also uses :

- an interface kit used to load the database from a personal computer via the data loader jack,
- the blower of the radio air cooling system.

VHF transmissions may affect GPS signal reception. Optional filters may be inserted in coaxial line which links transceiver and antenna of COM 1 and COM 2 systems.

Using the switch / annunciator "NAV 1 - GPS" of M6 advisory panel, the remote relay boxes E023 and E92 provide switching of NAV 1 or GPS information to the horizontal situation indicator of the heading reference system - refer to 34-21-00.

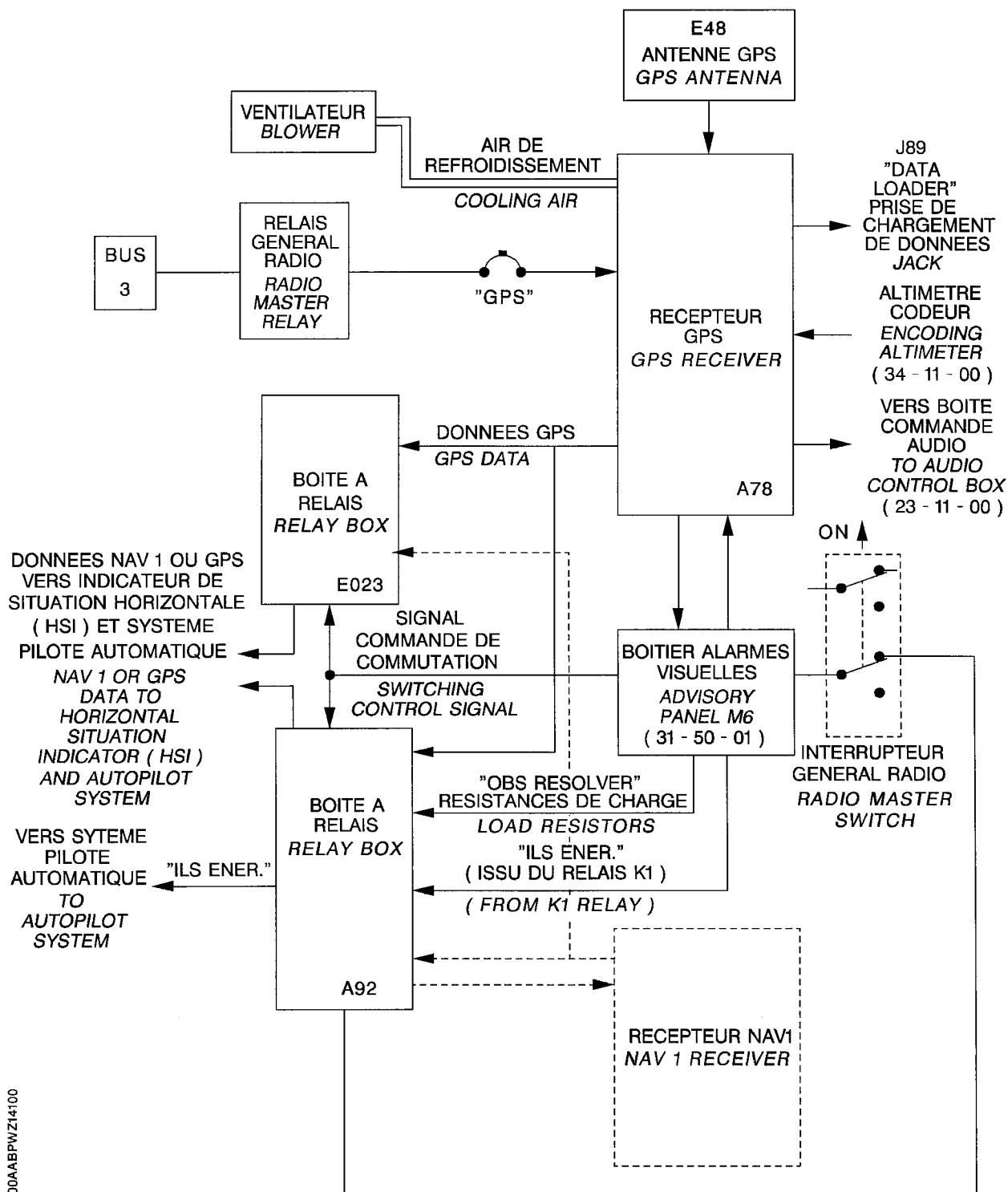
The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.

AJAJ

Validity : KLN 90B with HSI
NAV 1 / GPS switching

34-57-00 (DE)

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Global Positioning System (GPS) - Electrical schematic
Figure 1

AJAJ

Validity : KLN 90B with HSI
NAV 1 / GPS switching

34-57-00 (DE)

Page 2
FEB 00

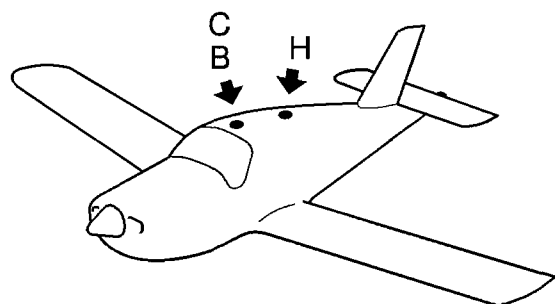
14345700AABPWZ14100

2. LOCATION (Figures 2 and 3)

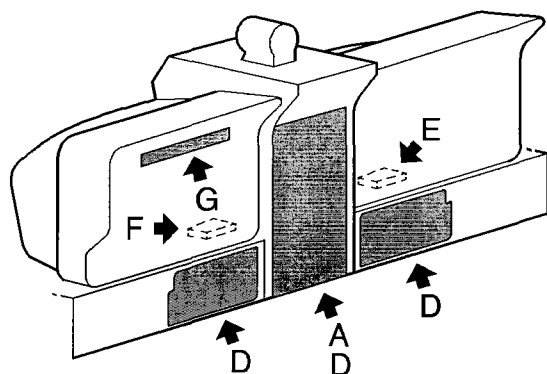
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-50-00
E48 GPS antenna	1	210	/	34-57-02
E023 relay box	1	250	Behind the R.H. instrument panel	34-57-05
A92 relay box	1	250	Behind the L.H. instrument panel	34-57-05
Filter (option)	2	230	251L	34-57-00
Blower	1	230	211R	34-57-00
J89 "data loader" jack	1	254L or 254R or 251C	/	34-57-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

3. OPERATION

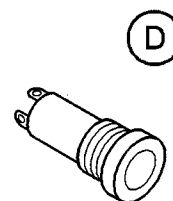
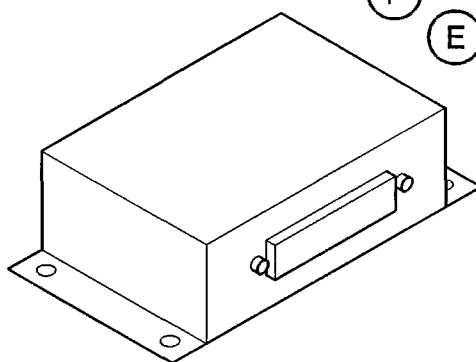
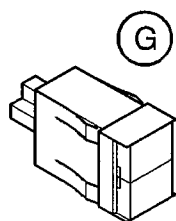
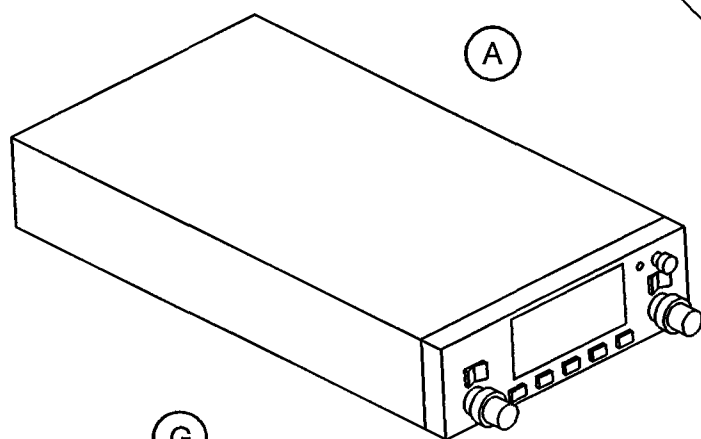
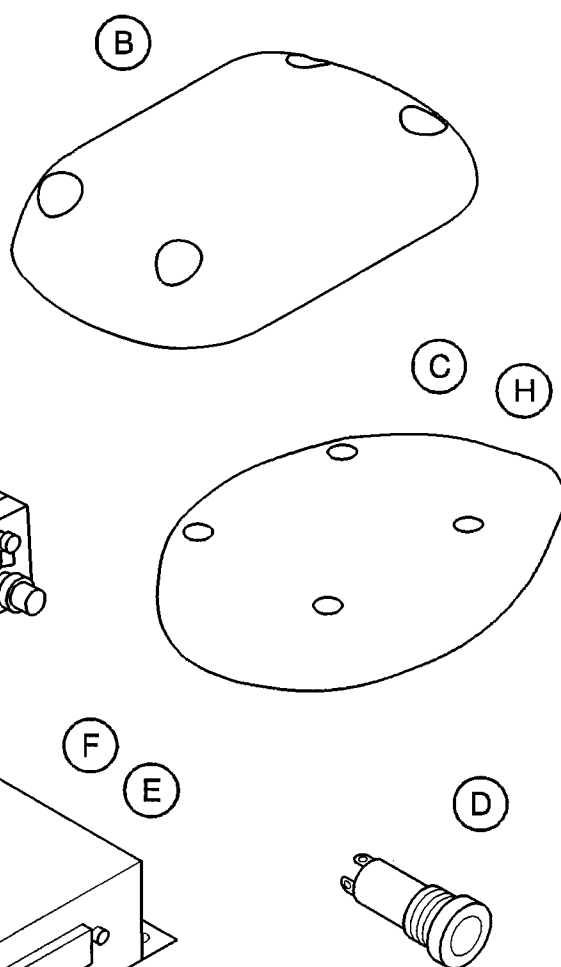
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



- A - A78 GPS receiver
- B - E48 GPS antenna (Pre-MOD. 151)
- C - E48 GPS antenna variant (Pre-MOD. 151)
- D - J89 "data loader" jack
- E - E023 relay box
- F - A92 relay box
- G - Switch / annunciators or annunciators
- H - E48 GPS antenna (Post-MOD. 151)



 Variante de localisation
Alternate location



Global Positioning System (GPS) - Identification and location of components
Figure 2

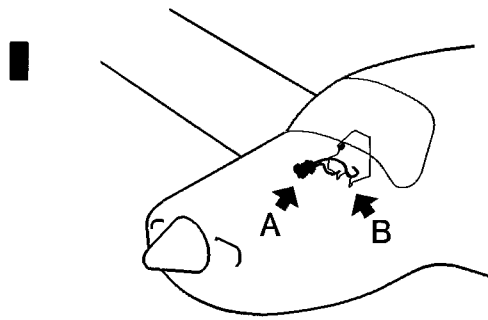
AJAJ

Validity : KLN 90B with HSI
NAV 1 / GPS switching

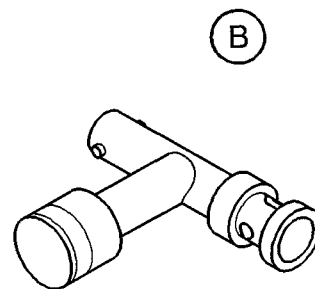
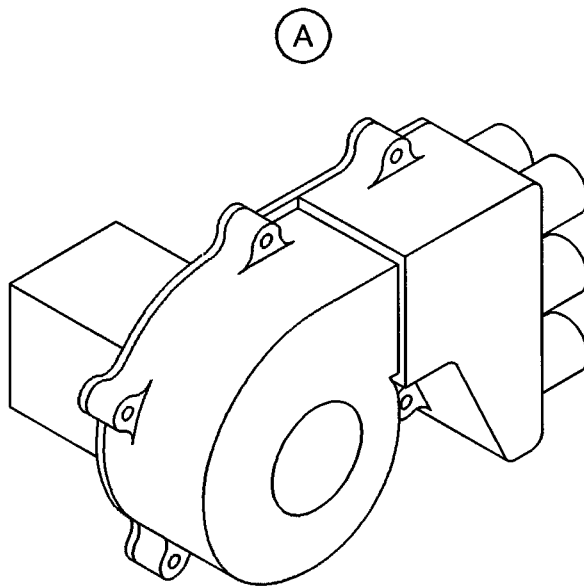
34-57-00 (DE)

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I4345700AAADWZ24001



A - Blower
B - Filter (Option)



14345700AAA PVZ4000

Global Positioning System (GPS) - Identification and location of components
Figure 3

AJAJ
Validity : KLN 90B with HSI
NAV 1 / GPS switching

34-57-00 (DE)

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL

The GPS is a satellite-based radionavigation system which enables an aircraft to be located anywhere (tridimensional positioning : latitude, longitude and altitude).

The system consists of :

- the A78 COMM./VOR-ILS/GPS transceiver,
- the E48 GPS antenna GA 56,
- the K81 relay.

The system also uses :

- the M73 Horizontal Situation Indicator (HSI) - refer to 34-21-00,
- the M6 advisory panel - refer to 31-50-00.

According to the installed options, the system receives and/ or sends information to :

- the GPS 2 (GNS 430) - refer to 34-57-00,
- the autopilot system - refer to 22-12-00,
- the fuel flow system - refer to 73-30-00.

The A78 COMM./VOR-ILS/GPS transceiver receives altitude information from the encoding altimeter - refer to 34-11-00.

For the description of communication function of the A78 COMM./VOR-ILS/GPS transceiver, refer to 23-12-00.

For the description of VOR/ILS function of the A78 COMM./VOR-ILS/GPS transceiver, refer to 34-51-00.

Without "Ground Clearance"

The A78 COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar.

With "Ground Clearance"

The installation is electrically supplied by "BUS 1" bar or by battery.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 COMM./VOR-ILS/ GPS transceiver	1	PL30	/	34-50-00
E48 GPS antenna	1	240	/	34-57-02
K81 relay	1	251C	/	34-57-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker :				
- CB 87 "NAV GPS 1"	1	PL1	/	WM
- CB17 (option)	1	210	218A	WM

3. DESCRIPTION

A. A78 COMM./VOR-ILS/GPS transceiver (Figure 2)

The A78 COMM./VOR-ILS/GPS transceiver can provide :

- permanent aircraft position-related information (longitude and latitude),
- guidance and navigation information display in relation to a flight plan defined by the pilot.

It also uses data stored in a data base card (11) inserted in the front panel of the equipment.

The A78 COMM./VOR-ILS/GPS transceiver is capable of tracking up to twelve satellites at the same time to compute a position.

The memory capacity of the GPS receiver can store :

- 1000 pilot-defined waypoints,
- 20 different flight plans of up to 31 waypoints each.

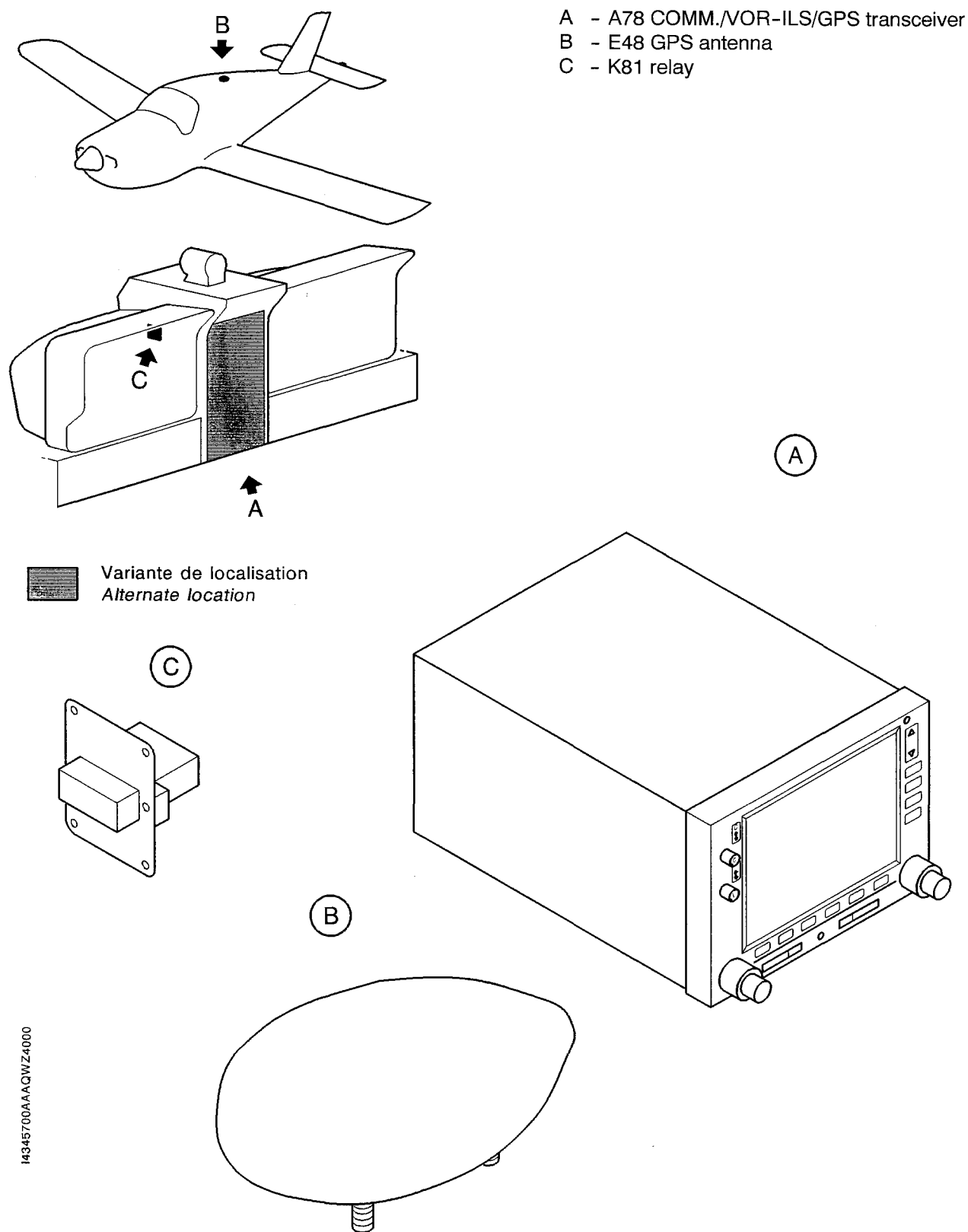
Mainly controlled by the two concentric knobs (6) at the R.H. of the front face, the A78 COMM./VOR-ILS/GPS transceiver can present a variety of information in a number of different page formats. One way to understand how the information is presented is to think of the transceiver various display types as chapters in a book, with numbered pages each.

The outer knob changes the chapters when the cursor function is disabled and is used to move the cursor when the function is enabled. The inner knob turns the pages when the cursor function is disabled and is used to modify the data in inverse video over the cursor when the function is enabled.

To change data in a page, use the cursor function. This function is an inverse video area on the display obtained by pressing momentarily the "PUSH CRSR" inner button. Rotate the outer knob to position the cursor and the inner knob to select the desired characters. Repeat this step as many times as necessary and validate ("ENT" pushbutton).

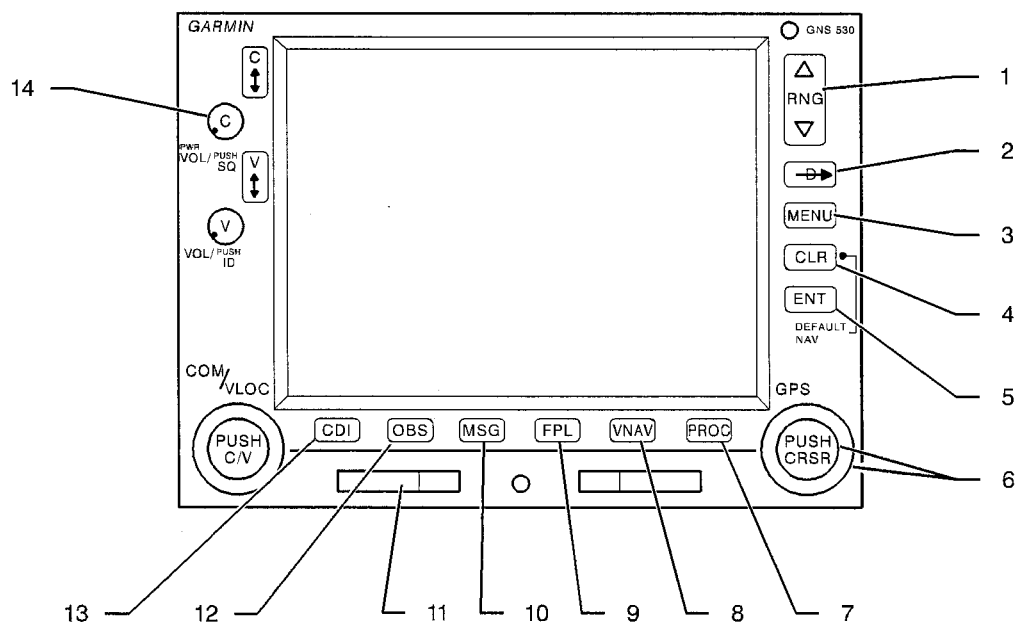
The outer knob is rotated to select the following chapters :

- NAV
- WPT
- AUX
- NRST



Global Positioning System (GPS) – Identification and location of components
Figure 1

- 1 - "RNG" (Range) pushbutton
- 2 - "D" (Direct to) pushbutton
- 3 - "MENU" pushbutton
- 4 - "CLR" (Clear) pushbutton
- 5 - "ENT" (Enter) pushbutton
- 6 - Concentric knobs
- 7 - "PROC" (procedures) pushbutton
- 8 - "VNAV" pushbutton
- 9 - "FPL" (Flight plan) pushbutton
- 10 - "MSG" (Message) pushbutton
- 11 - Data base card
- 12 - "OBS" pushbutton
- 13 - "CDI" pushbutton
- 14 - ".C" ON/OFF pushbutton



Global Positioning System (GPS) - A78 COMM./VOR-ILS/GPS transceiver
Figure 2

The other front face buttons have the following functions :

- the "RNG" pushbuttons (1) modify the scale of the card displayed on the screen,
- the "D→" pushbutton (2) provides access to the "Direct to" navigation operation mode towards a waypoint,
- the "MENU" pushbutton (3) provides access to a list of options inside a page,
- the "CLR" pushbutton (4) enables the pilot to cancel the data displayed on the screen or to come back to NAV 1 page,
- the "ENT" pushbutton (5) enables the pilot to validate an operation or to store the data entered with the cursor function,
- the "PROC" pushbutton (7) enables the pilot to select and modify the loading of departure, approach or arrival procedures of the initiated flight plan,
- the "VNAV" pushbutton (8) provides access to the vertical navigation page,
- the "FPL" pushbutton (9) enables the pilot to create, edit and initiate flight plans,
- the "MSG" pushbutton (10), enables the pilot, when "MSG" message appears on the display, to access a consultation page,
- the "OBS" pushbutton (12) enables the selection of the manual mode (OBS of the course deviation indicator or of the HSI) or of the automatic mode (LEG) when sequencing the waypoints,
- the "CDI" pushbutton (13) enables the selected VOR/ILS or GPS information to be directed towards M81 course deviation indicator or towards the M73 HSI,
- the ".C" pushbutton (14) enables the energization of the system.

Without "Ground Clearance"

The A78 COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar via CB 87 "NAV GPS 1" circuit breaker.

With "Ground Clearance"

In normal operation, the A78 COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar via a main radio relay and via K201-relay contacts in idle position. It is protected by CB 87 "NAV GPS1" circuit breaker.

When "Ground Clearance" function is enabled, the battery electrically supplies A78 COMM./VOR-ILS/GPS transceiver directly, via K201-relay contacts in work position. CB 17 circuit breaker thus protects the feed line. The circuit breaker is secured to frame No. 4 near the starter relay.

All

The A78 COMM./VOR-ILS/GPS transceiver is mounted on PL30 radio rack.

B. E48 GPS antenna

E48 GPS antenna ensures the reception of the signals. It operates within the D band at the frequency of 1575.42 MHz.

It is a flat and small size antenna secured by means of four nuts.

The antenna is mounted on top of the fuselage between C3 and C4 frames.

C. K81 relay

The relay controls lighting of "GPS CRS LEG" or "GPS CRS OBS" annunciators on M6 advisory panel. A78 COMM./VOR-ILS/GPS transceiver controls the relay coil.

The relay is mounted onto the R.H. side of the radio rack (external side), aft of connecting plugs.

4. OPERATION (Figures 3 and 3A)

The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

The "CDI" pushbutton on the front panel of the COMM./VOR-ILS/ GPS transceiver enables the selected information of the VOR/ILS or GPS navigation source to be directed towards the horizontal situation indicator (HSI). A "VLOC" or "GPS" message appears on the display above the "CDI" pushbutton to confirm the selection.

"NAV1/GPS1" pushbutton of M6 advisory panel enables the selected information of VOR/ILS or GPS navigation source to be directed towards the horizontal situation indicator. The pushbutton indicator light relative to selection illuminates.

At energization, the equipment automatically performs a test and displays a page about the validity of the NAV data base card. To exit this page press momentarily the "ENT" pushbutton. The equipment shifts into satellite acquisition phase and then is ready for operation. If the satellite coverage is marginal, the equipment uses the altitude coding supplied by the encoding altimeter of the aircraft.

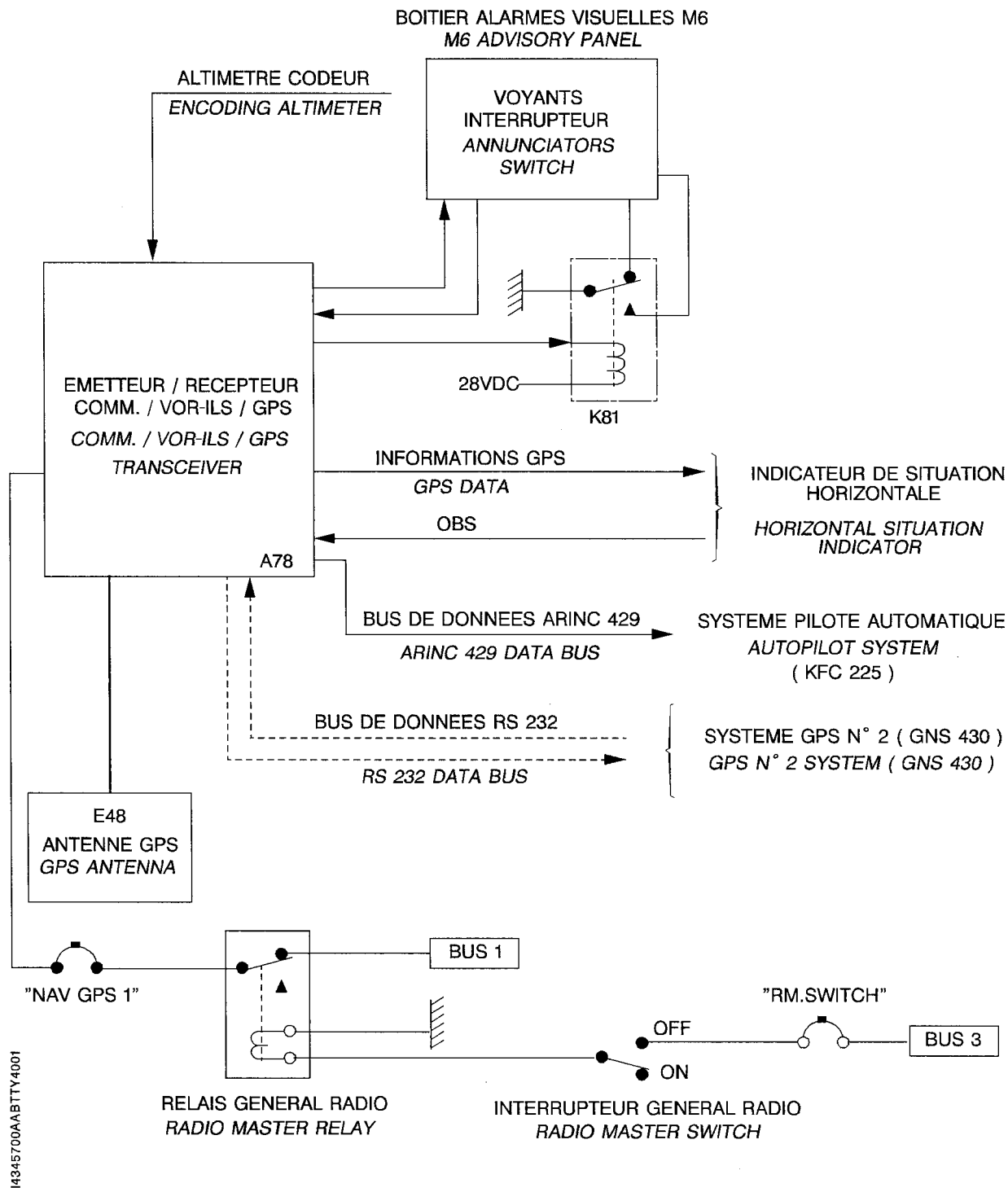
On the advisory panel, GPS function lights are directly controlled by the COMM./VOR-ILS/ GPS transceiver to inform or alert the pilot of a situation requiring his attention.

The COMM./VOR-ILS/ GPS transceiver converts GPS navigation information into DC signals, to actuate the vertical pointer, the "TO/FR" indicator and the warning flag of the horizontal situation indicator (HSI).

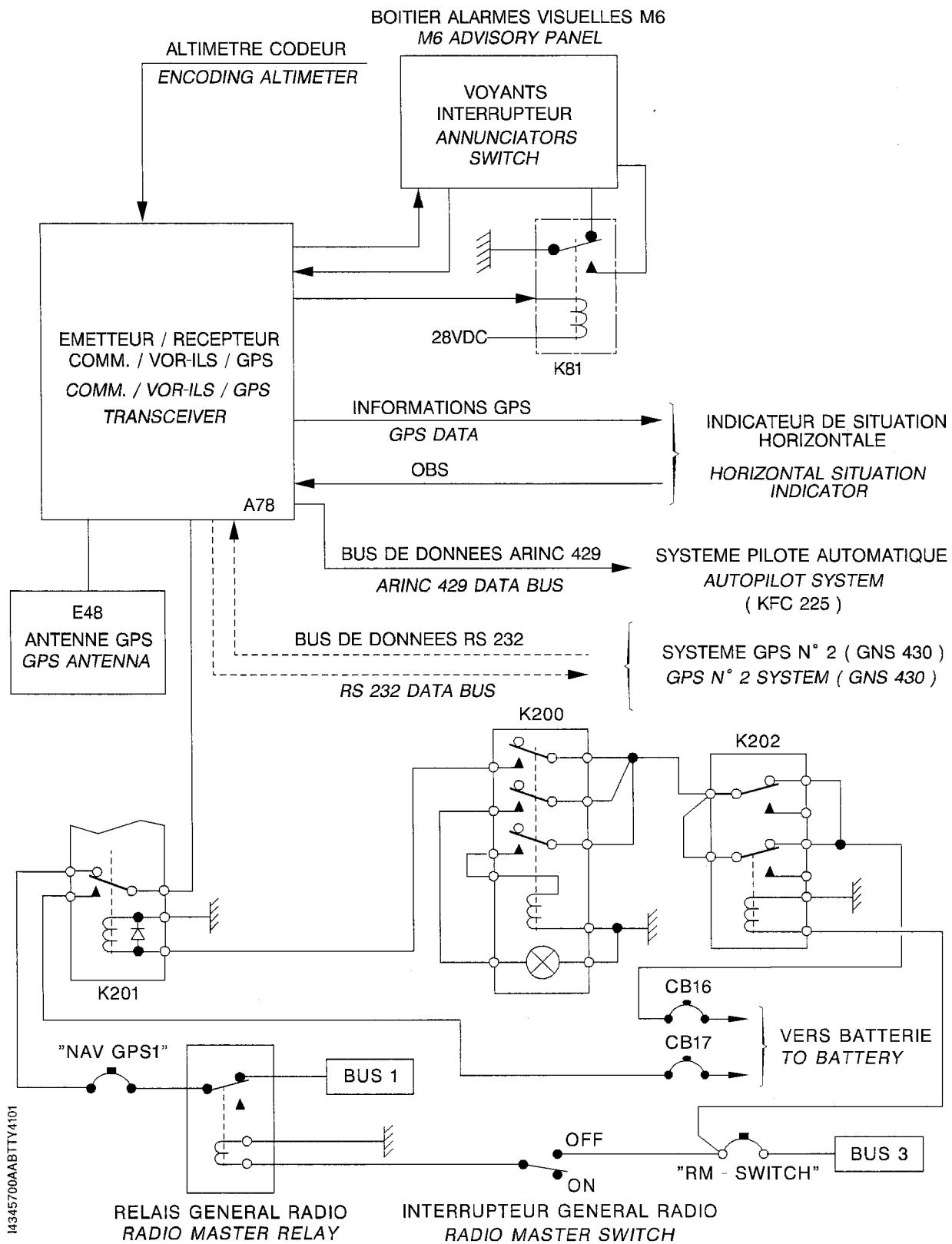
The COMM./VOR-ILS/ GPS transceiver connected to an equipment of the same type (GNS 430) of the GPS 2 enables, via a RS232 type link, flight plans to be transferred from station to station.

The A82 flight computer of the autopilot receives the GPS navigation data.

For the management of fuel pages, the COMM./VOR-ILS/ GPS transceiver exchanges, via a RS232 type link, data with the fuel flow system.



Global Positioning System (GPS) – Schematic
Figure 3 - Without "Ground Clearance"



Global Positioning System (GPS) – Schematic
Figure 3A - With "Ground Clearance"

GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL

The GPS is a satellite-based radionavigation system which enables an aircraft to be located anywhere (tridimensional positioning : latitude, longitude and altitude).

The system consists of :

- the A78 COMM./VOR-ILS/GPS transceiver GNS 430
- the E48 GPS antenna GA 56

The system also uses :

- the M81 (GI 106A) course deviation indicator - refer to 34-51-00,
- or the M73 Horizontal Situation Indicator (HSI) - refer to 34-21-00,
- the M6 advisory panel - refer to 31-50-00.

According to the installed options, the system receives and/ or sends information to :

- the GPS 2 (GNS 430) - refer to 34-57-00,
- the autopilot system - refer to 22-12-00,
- the fuel flow system - refer to 73-30-00.

The A78 COMM./VOR-ILS/GPS transceiver receives altitude information from the encoding altimeter - refer to 34-11-00.

For the description of communication function of the A78 COMM./VOR-ILS/GPS transceiver - refer to 23-12-00.

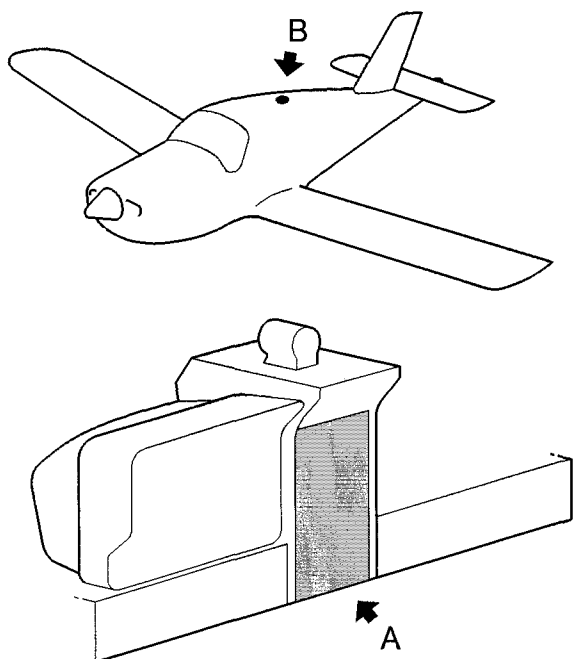
For the description of VOR/ILS function of the A78 COMM./VOR-ILS/GPS transceiver - refer to 34-51-00.

The A78 COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar.

2. LOCATION (Figure 1)

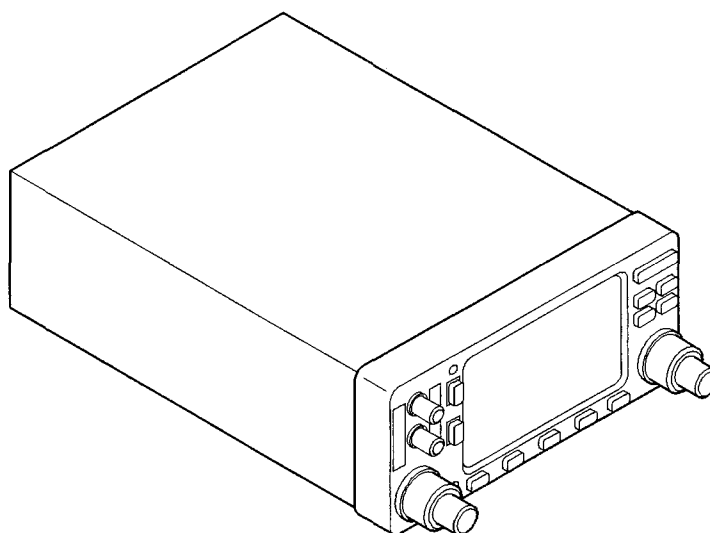
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 COMM./VOR-ILS/ GPS transceiver	1	PL30	/	34-50-00
E48 GPS antenna	1	240	/	34-57-02
M81 course deviation indicator	1	251L	/	34-51-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - CB 87 "NAV GPS 1"	1	PL1	/	WM

- A - A78 COMM./VOR-ILS/GPS transceiver
B - E48 GPS antenna

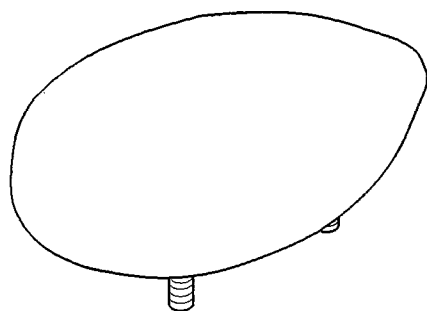


 Variante de localisation
Alternate location

(A)



(B)



Global Positioning System (GPS) – Identification and location of components
Figure 1

14345700AABQVZ4000

3. DESCRIPTION

A. A78 COMM./VOR-ILS/GPS transceiver (Figure 2)

The A78 COMM./VOR-ILS/GPS transceiver can provide :

- permanent aircraft position-related information (longitude and latitude),
- guidance and navigation information display in relation to a flight plan defined by the pilot.

It also uses data stored in a data base card (1) inserted in the front panel of the equipment.

The A78 COMM./VOR-ILS/GPS is capable of tracking up to twelve satellites at the same time to compute a position.

The memory capacity of the GPS receiver can store :

- 1000 pilot-defined waypoints,
- 20 different flight plans of up to 31 waypoints each.

Mainly controlled by the two concentric knobs (8) at the R.H. of the front face, the A78 COMM./VOR-ILS/GPS transceiver can present a variety of information in a number of different page formats. One way to understand how the information are presented is to think of the transceiver various display types as chapters in a book, with numbered pages each.

The outer knob changes the chapters when the cursor function is disabled and is used to move the cursor when the function is enabled. The inner knob turns the pages when the cursor function is disabled and is used to modify the data in inverse video over the cursor when the function is enabled.

To change data in a page, use the cursor function. This function is an inverse video area on the display obtained by pressing momentarily the "PUSH CRSR" inner button. Rotate the outer knob to position the cursor and the inner knob to select the desired characters. Repeat this step as many times as necessary and validate ("ENT" pushbutton).

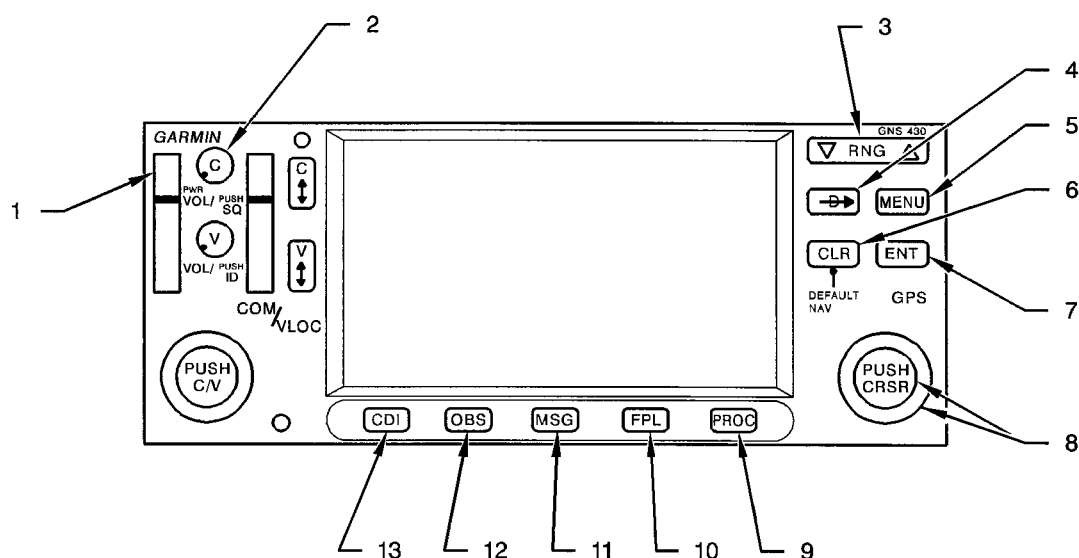
The outer knob is rotated to select the following chapters :

- NAV
- WPT
- AUX
- NRST

The other front face buttons have the following functions :

- the "RNG" pushbuttons (3) modify the scale of the card displayed on the screen,
- the "D➡" pushbutton (4) provides access to the "Direct to" navigation operation mode towards a waypoint.
- the "MENU" pushbutton (5) provides access to a list of options inside a page,
- the "CLR" pushbutton (6) enables the pilot to cancel the data displayed on the screen or to come back to NAV 1 page.

- 1 - Data base card
- 2 - ".C" ON/OFF button
- 3 - "RNG" (Range) pushbutton
- 4 - "→" (Direct to) pushbutton
- 5 - "MENU" pushbutton
- 6 - "CLR" (Clear) pushbutton
- 7 - "ENT" (Enter) pushbutton
- 8 - Concentric knobs
- 9 - "PROC" (Procedures) pushbutton
- 10 - "FPL" (Flight plan) pushbutton
- 11 - "MSG" (Message) pushbutton
- 12 - "OBS" pushbutton
- 13 - "CDI" pushbutton



Global Positioning System (GPS) - A78 COMM./VOR-ILS/GPS transceiver
Figure 2

I4231200AAARVZ14000

- the "ENT" pushbutton (7) enables the pilot to validate an operation or to store the data entered with the cursor function.
- the "PROC" pushbutton (9) enables the pilot to select and modify the loading of departure, approach or arrival procedures of the initiated flight plan,
- the "FLP" pushbutton (10) enables the pilot to create, edit and initiate flight plans,
- the "MSG" pushbutton (11), enables the pilot, when "MSG" message appears on the display, to access a consultation page.
- the "OBS" pushbutton (12) enables the selection of the manual mode (OBS of the course deviation indicator or of the HSI) or of the automatic mode (LEG) when sequencing the waypoints,
- the "CDI" pushbutton (13) enables the selected VOR/ILS or GPS information to be directed towards M81 course deviation indicator or towards the M73 HSI,
- the ".C" pushbutton (2) enables the energization of the system.

The A78 COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 1" bar via CB 87 "NAV GPS 1" circuit breaker.

The A78 COMM./VOR-ILS/GPS transceiver is mounted on PL30 radio rack.

B. E48 GPS antenna

E48 GPS antenna ensures the reception of the signals. It operates within the D band at the frequency of 1575.42 MHz.

It is a flat and small size antenna secured by means of four nuts.

The antenna is mounted on top of the fuselage between C3 and C4 frames.

4. OPERATION (Figure 3)

The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

The "CDI" pushbutton on the front panel of the COMM./VOR-ILS/ GPS transceiver enables the selected information of the VOR/ILS or GPS navigation source to be directed towards the course deviation indicator or towards the HSI. A "VLOC" or "GPS" message appears on the display above the "CDI" pushbutton to confirm the selection.

Aircraft with M81 course deviation indicator

The same message appears on the front face of the indicator.

Aircraft with M73 horizontal situation indicator (HSI)

"NAV1/GPS1" pushbutton of M6 advisory panel enables the selected information of VOR/ILS or GPS navigation source to be directed towards the horizontal situation indicator. The pushbutton indicator light relative to selection illuminates.

All

At energization, the equipment automatically performs a test and displays a page about the validity of the NAV data base card. To exit this page press momentarily the "ENT" pushbutton. The equipment shifts into satellite acquisition phase and then is ready for operation. If the satellite coverage is marginal, the equipment uses the altitude coding supplied by the encoding altimeter of the aircraft.

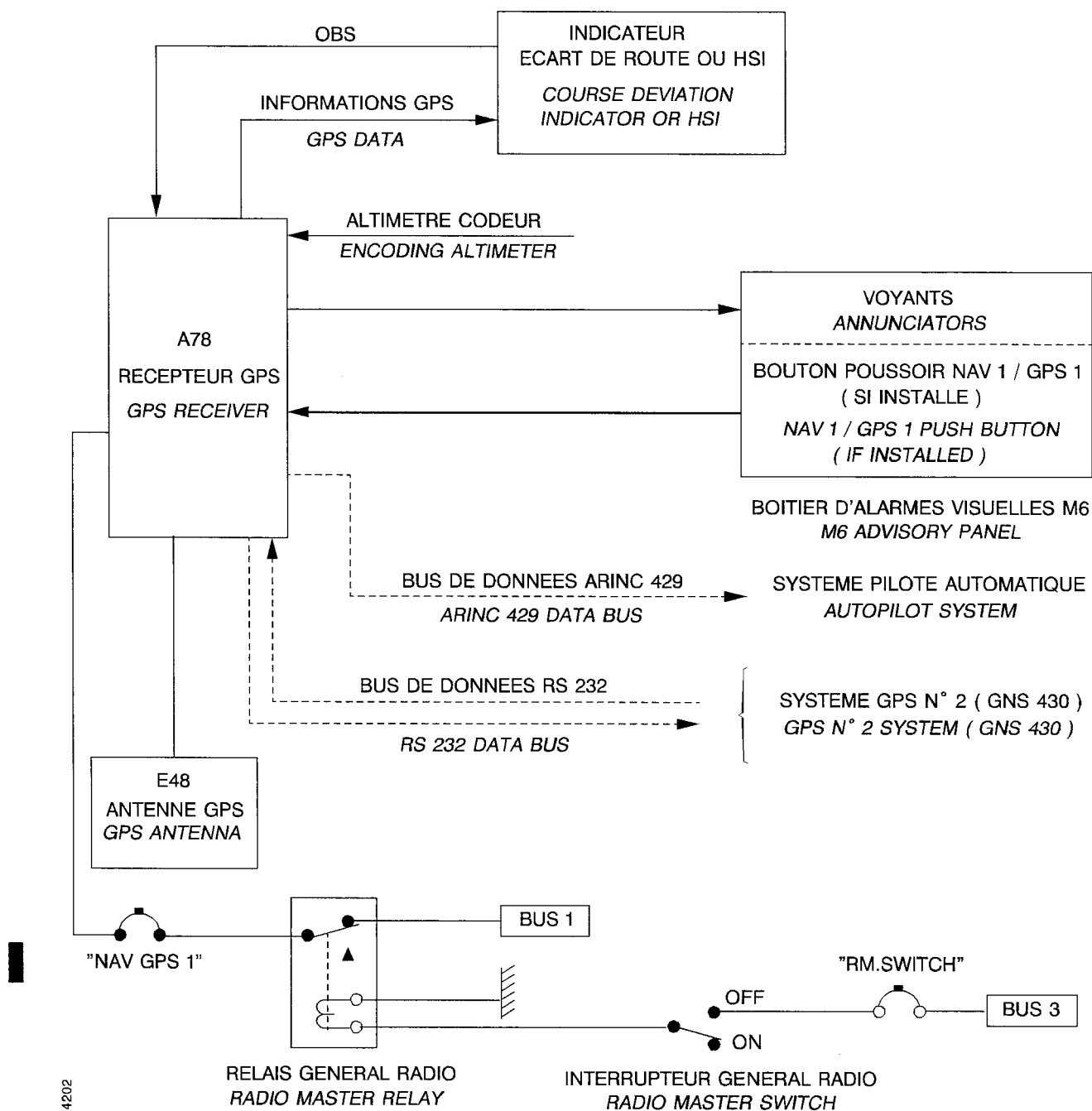
On the advisory panel, GPS function lights are directly controlled by the COMM./VOR-ILS/ GPS transceiver to inform or alert the pilot of a situation requiring his attention.

The COMM./VOR-ILS/ GPS transceiver converts GPS navigation information into DC signals, to actuate the vertical pointer, the "TO/FR" indicator and the warning flag of the course deviation indicator or of the HSI.

The COMM./VOR-ILS/ GPS transceiver connected to an equipment of the same type (GNS 430) of the GPS 2 enables, via a RS232 type link, flight plans to be transferred from station to station.

The A82 flight computer of the autopilot receives the GPS navigation data.

For the management of fuel pages, the COMM./VOR-ILS/ GPS transceiver exchanges, via a RS232 type link, data with the fuel flow system.



I4345700AABQVZ4202

Global Positioning System (GPS) – Schematic
Figure 3

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL

The GPS is a satellite-based radionavigation system which enables an aircraft to be located anywhere (tridimensional positioning : latitude, longitude and altitude).

The system consists of :

- the A77 COMM./VOR-ILS/GPS transceiver GNS 430
- the E49 GPS antenna GA 56

The system also uses :

- the M74 course deviation indicator to display VOR/ILS or GPS information - refer to 34-52-00,

The A77 COMM./VOR-ILS/GPS transceiver receives altitude information from the encoding altimeter - refer to 34-11-00.

The A77 COMM./VOR-ILS/GPS transceiver is connected, via RS232 type link to GPS 1 (400-series or 500-series GNS) system - refer to 34-57-00.

For the description of communication function of the A77 COMM./VOR-ILS/GPS transceiver - refer to 23-13-00.

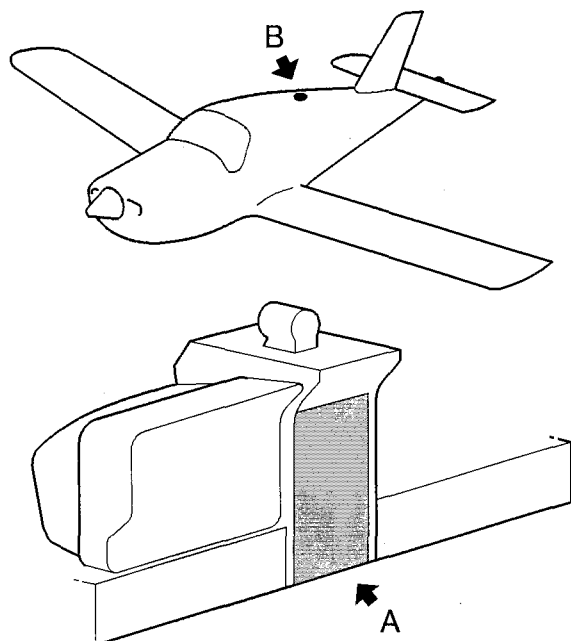
For the description of VOR/ILS function of the A77 COMM./VOR-ILS/GPS transceiver - refer to 34-52-00.

The A77 COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 3" bar.

2. LOCATION (Figure 1)

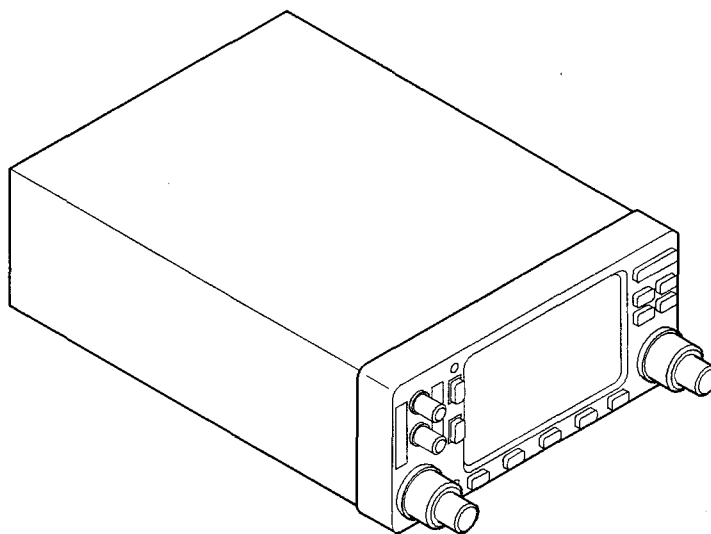
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A77 COMM./VOR-ILS/ GPS transceiver	1	PL30	/	34-50-00
E49 GPS antenna	1	240	/	34-57-02
M74 course deviation indicator	1	251L	/	34-52-00
Circuit breaker : - CB 194 "NAV GPS 2"	1	PL1	/	WM

- A - A77 COMM./VOR-ILS/GPS transceiver
- B - E49 GPS antenna

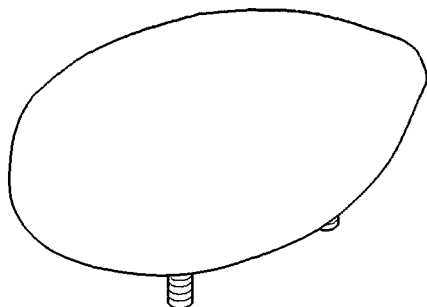


Variante de localisation
Alternate location

(A)



(B)



Global Positioning System (GPS) – Identification and location of components
Figure 1

I4345700AABQVZ4100

3. DESCRIPTION

A. A77 COMM./VOR-ILS/GPS transceiver (Figure 2)

The A77 COMM./VOR-ILS/GPS transceiver can provide :

- permanent aircraft position-related information (longitude and latitude),
- guidance and navigation information display in relation to a flight plan defined by the pilot.

It also uses data stored in a data base card (1) inserted in the front panel of the equipment.

The A77 COMM./VOR-ILS/GPS receiver is capable of tracking up to twelve satellites at a time to compute a position.

The memory capacity of the GPS receiver can store :

- 1000 pilot-defined waypoints,
- 20 different flight plans of up to 31 waypoints each.

Mainly controlled by the two concentric knobs (8) at the R.H. of the front face, the COMM./VOR-ILS/GPS transceiver can present a variety of information in a number of different page formats. One way to understand how the information are presented is to think of the transceiver various display types as chapters in a book, with numbered pages each.

The outer knob changes the chapters when the cursor function is disabled and is used to move the cursor when the function is enabled. The inner knob turns the pages when the cursor function is disabled and is used to modify the data in inverse video over the cursor when the function is enabled.

To change data in a page, use the cursor function. This function is an inverse video area on the display obtained by pressing momentarily the "PUSH CRSR" inner button. Rotate the outer knob to position the cursor and the inner knob to select the desired characters. Repeat this step as many times as necessary and validate ("ENT" pushbutton).

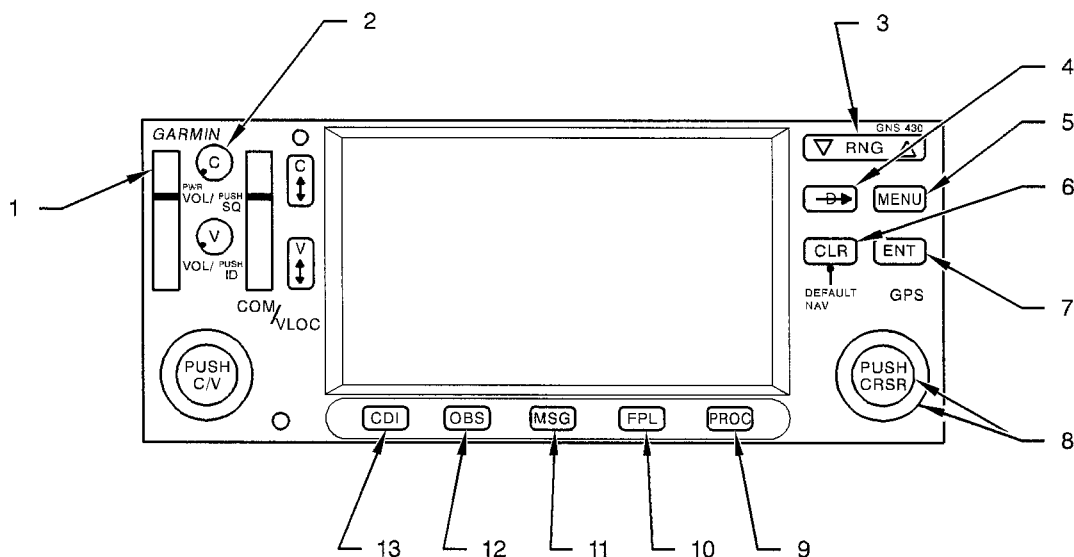
The outer knob is rotated to select the following chapters :

- NAV
- WPT
- AUX
- NRST

The other front face buttons have the following functions :

- the "RNG" pushbuttons (3) modify the scale of the card displayed on the screen,
- the "D➡" pushbutton (4) provides access to the "Direct to" navigation operation mode towards a waypoint.
- the "MENU" pushbutton (5) provides access to a list of options inside a page,
- the "CLR" pushbutton (6) enables the pilot to cancel the data displayed on the screen or to come back to NAV 1 page.

- 1 - Data base card
- 2 - ".C" button (ON/OFF)
- 3 - "RNG" (Range) pushbutton
- 4 - "→" (Direct to) pushbutton
- 5 - "MENU" pushbutton
- 6 - "CLR" (Clear) pushbutton
- 7 - "ENT" (Enter) pushbutton
- 8 - Concentric knobs
- 9 - "PROC" (Procedures) pushbutton
- 10 - "FPL" (Flight plan) pushbutton
- 11 - "MSG" (Message) pushbutton
- 12 - "OBS" pushbutton
- 13 - "CDI" pushbutton



Global Positioning System (GPS) - A77 COMM./VOR-ILS/GPS transceiver
Figure 2

14231200AAA RVZ14000

- the "ENT" pushbutton (7) enables the pilot to validate an operation or to store the data entered with the cursor function.
- the "PROC" pushbutton (9) enables the pilot to select and modify the loading of departure, approach or arrival procedures of the initiated flight plan,
- the "FLP" pushbutton (10) enables the pilot to create, edit and initiate flight plans,
- the "MSG" pushbutton (11), enables the pilot, when "MSG" message appears on the display, to access a consultation page.
- the "OBS" pushbutton (12) enables the selection of the manual mode (OBS of the course deviation indicator or of the HSI) or of the automatic mode (LEG) when sequencing the waypoints,
- the "CDI" pushbutton (13) enables the selected VOR/ILS or GPS information to be directed towards M74 course deviation indicator,
- the ".C" pushbutton (2) enables the energization of the system.

The COMM./VOR-ILS/GPS transceiver is electrically supplied by "BUS 3" bar via CB 194 "NAV GPS 2" circuit breaker.

The COMM./VOR-ILS/GPS transceiver is mounted on PL30 radio rack.

B. E49 GPS antenna

E49 GPS antenna ensures the reception of the signals. It operates within the D band at the frequency of 1575.42 MHz.

It is a flat and small size antenna secured by means of four nuts.

The antenna is mounted on top of the fuselage between C5 and C6 frames.

4. OPERATION (Figure 3)

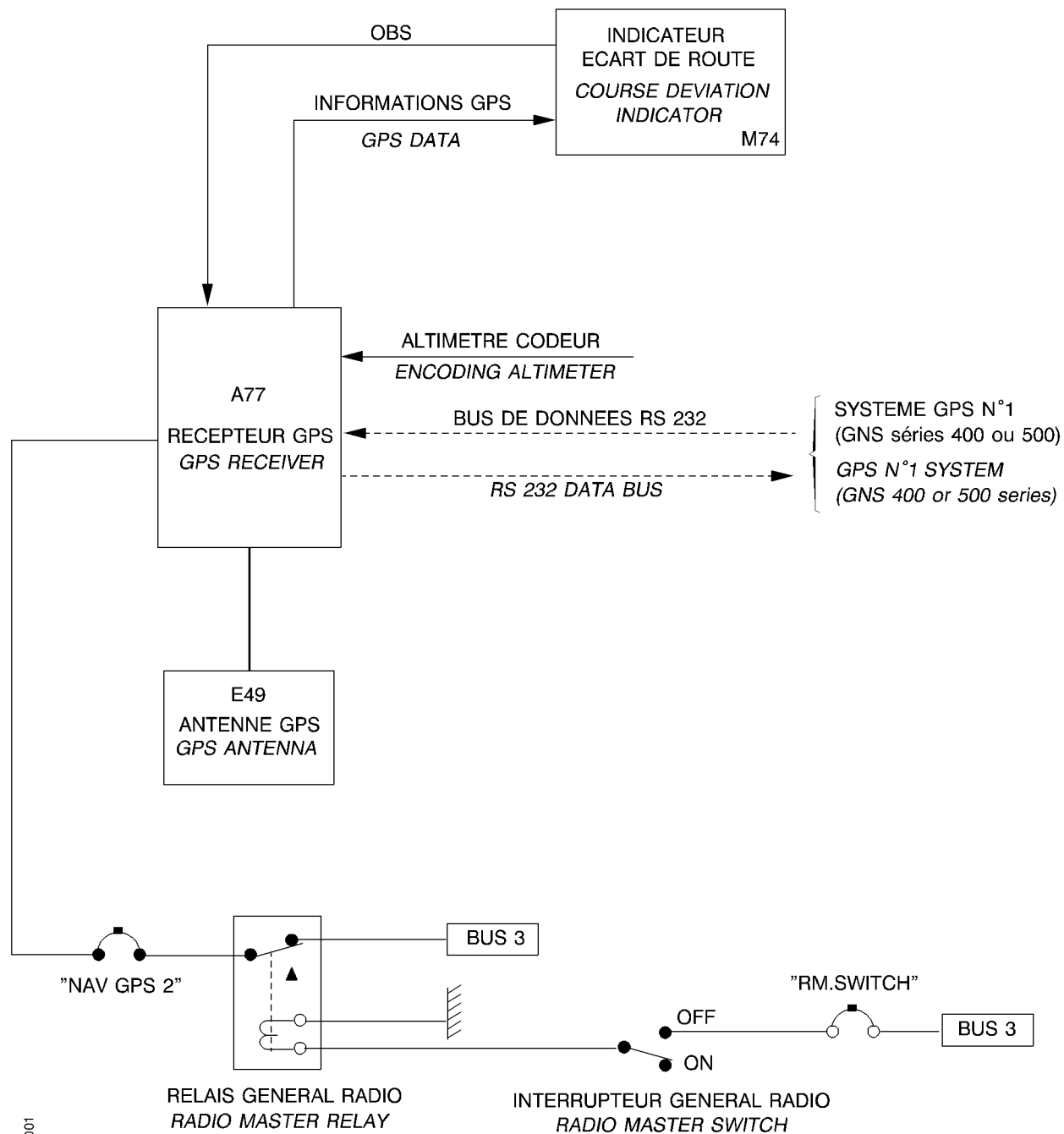
The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

The "CDI" pushbutton on the front panel of the COMM./VOR-ILS/ GPS transceiver enables the selected information of the VOR/ILS or GPS navigation source to be directed towards the course deviation indicator or towards the HSI. A "VLOC" or "GPS" message appears on the display above the "CDI" pushbutton to confirm the selection. The same message appears on the front face of the course deviation indicator.

At energization, the equipment automatically performs a test and displays a page about the validity of the NAV data base card. To exit this page press momentarily the "ENT" pushbutton. The equipment shifts into satellite acquisition phase and then is ready for operation. If the satellite coverage is marginal, the equipment uses the altitude coding supplied by the encoding altimeter of the aircraft.

The COMM./VOR-ILS/ GPS transceiver converts GPS navigation information into DC signals, to actuate the vertical pointer, the "TO/FR" indicator and the warning flag of the course deviation indicator.

The COMM./VOR-ILS/ GPS transceiver connected to an equipment of the same type (GNS 430) of the GPS 1 enables, via a RS232 type link, flight plans to be transferred from station to station.



14345700AABQVZ14001

Global Positioning System (GPS) – Schematic
Figure 3

GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which allows to solve the problem of an aircraft location anywhere (tridimensional positioning : latitude, longitude, altitude).

The optional system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- a J89 "data loader" jack,
- a removable data card (mounted in the front of the GPS receiver),
- an "MSG - WPT" annunciator of M6 advisory panel - refer to 31-50-01.

The GPS gets :

- altitude coding information from the encoding altimeter - refer to 34-11-00,
- data from the optional SHADIN fuel flow system - refer to 73-30-00.

The GPS sends an altitude - alert audio signal to the audio control box - refer to 23-11-00.

The GPS also uses :

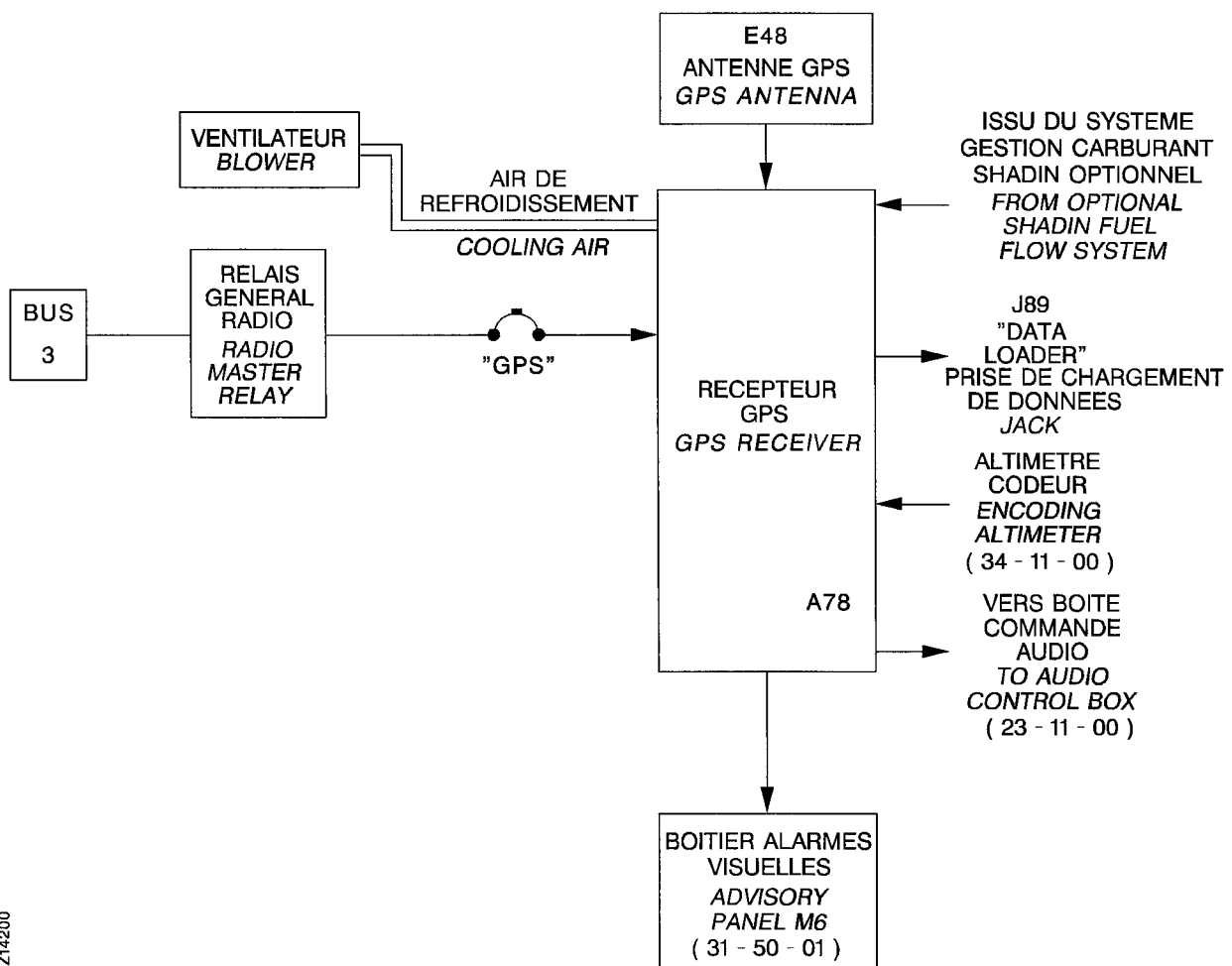
- an interface kit used to load the database from a personal computer via the data loader jack,
- the blower of the radio air cooling system.

VHF transmissions may affect GPS signal reception. Optional filters may be inserted in coaxial line which links transceiver and antenna of COM 1 and COM 2 systems.

The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.

S / N 1806

The GPS system is electrically supplied by "BUS 1" bar via the "GPS" circuit breaker.



I4345700AABPWZ14200

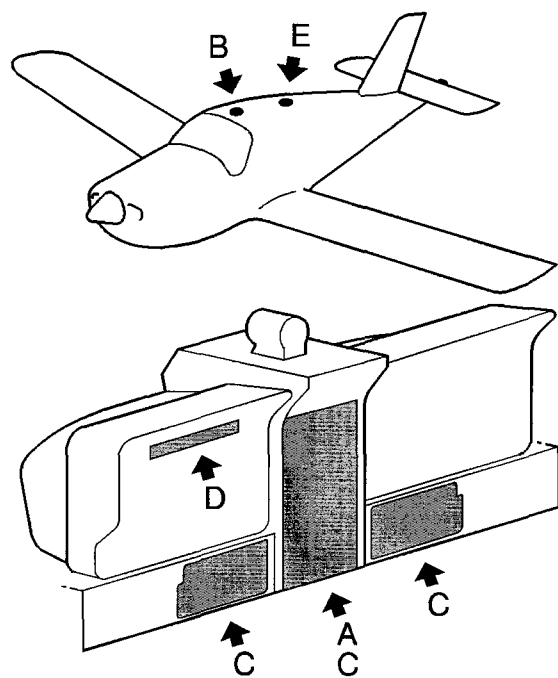
Global Positioning System (GPS) - Electrical schematic
Figure 1

2. LOCATION (Figures 2 and 3)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-50-00
E48 GPS antenna	1	210	/	34-57-02
J89 "data loader" jack	1	250	/	34-57-00
Filter (option)	2	230	251L	34-57-00
Blower	1	230	211R	34-57-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

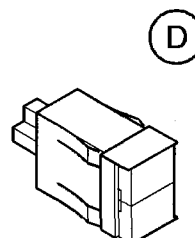
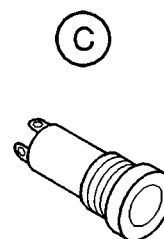
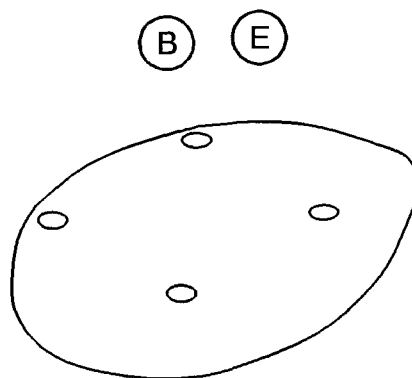
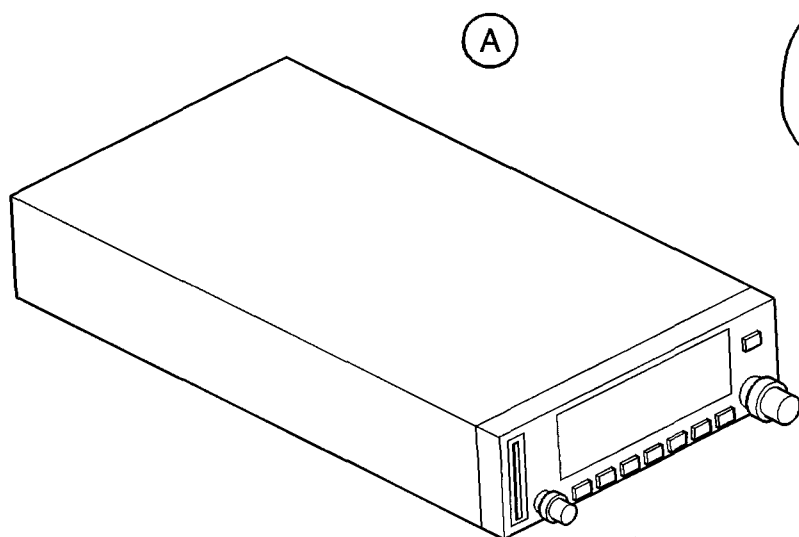
3. OPERATION

NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.

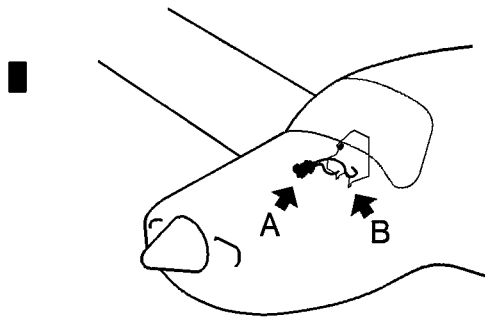


- A - A78 GPS receiver
- B - E48 GPS antenna (Pre-MOD. 151)
- C - J89 "data loader" jack
- D - "MSG / WPT" annunciator
- E - E48 GPS antenna (Post-MOD. 151)

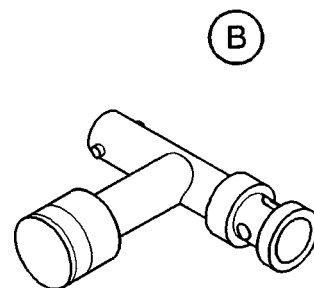
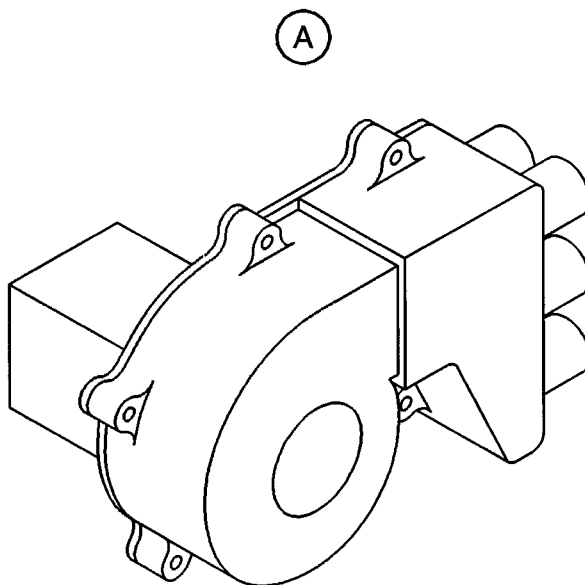
 Variante de localisation
Alternate location



Global Positioning System (GPS) - Identification and location of components
Figure 2



A - Blower
B - Filter (option)



14345700AAAPVZ4000

Global Positioning System (GPS) - Identification and location of components
Figure 3

AKAK
Validity : KLN 89B Stand alone

34-57-00 (EA)

Page 5
NOV 01

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GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL (Figure 1)

The GPS is a system of radio-navigation by satellites which allows to solve the problem of an aircraft location anywhere (tridimensional positioning : latitude, longitude, altitude).

The optional system consists of :

- an A78 GPS receiver,
- an E48 GPS antenna,
- an E023 relay box,
- an A92 relay box,
- a J89 "data loader" jack,
- a removable data card (mounted in the front of the GPS receiver).

The GPS also uses components of M6 advisory panel - refer to 31-50-01 :

- the switch / annunciator "NAV 1 - GPS",
- the switch / annunciator "GPS APR ARM - GPS APR ACTV",
- the annunciator "MSG - WPT",
- the K1 relay,
- two load resistors for NAV 1 receiver's OBS resolver.

The GPS also uses the "RADIO MASTER" switch.

The GPS gets :

- altitude coding information from the encoding altimeter - refer to 34-11-00,
- data from the optional SHADIN fuel flow system - refer to 73-30-00.

The GPS sends :

- an altitude - alert audio signal to the audio control box - refer to 23-11-00,
- guidance information to the optional autopilot system - refer to 22-12-00.

The GPS also uses :

- an interface kit used to load the database from a personal computer via the data loader jack,
- the blower of the radio air cooling system.

VHF transmissions may affect GPS signal reception. Filters are inserted in line with each VHF transmission line.

Using the switch / annunciator "NAV 1 - GPS" of M6 advisory panel, the remote relay boxes E023 and E92 provide switching of NAV 1 or GPS information to the horizontal situation indicator of the heading reference system - refer to 34-21-00.

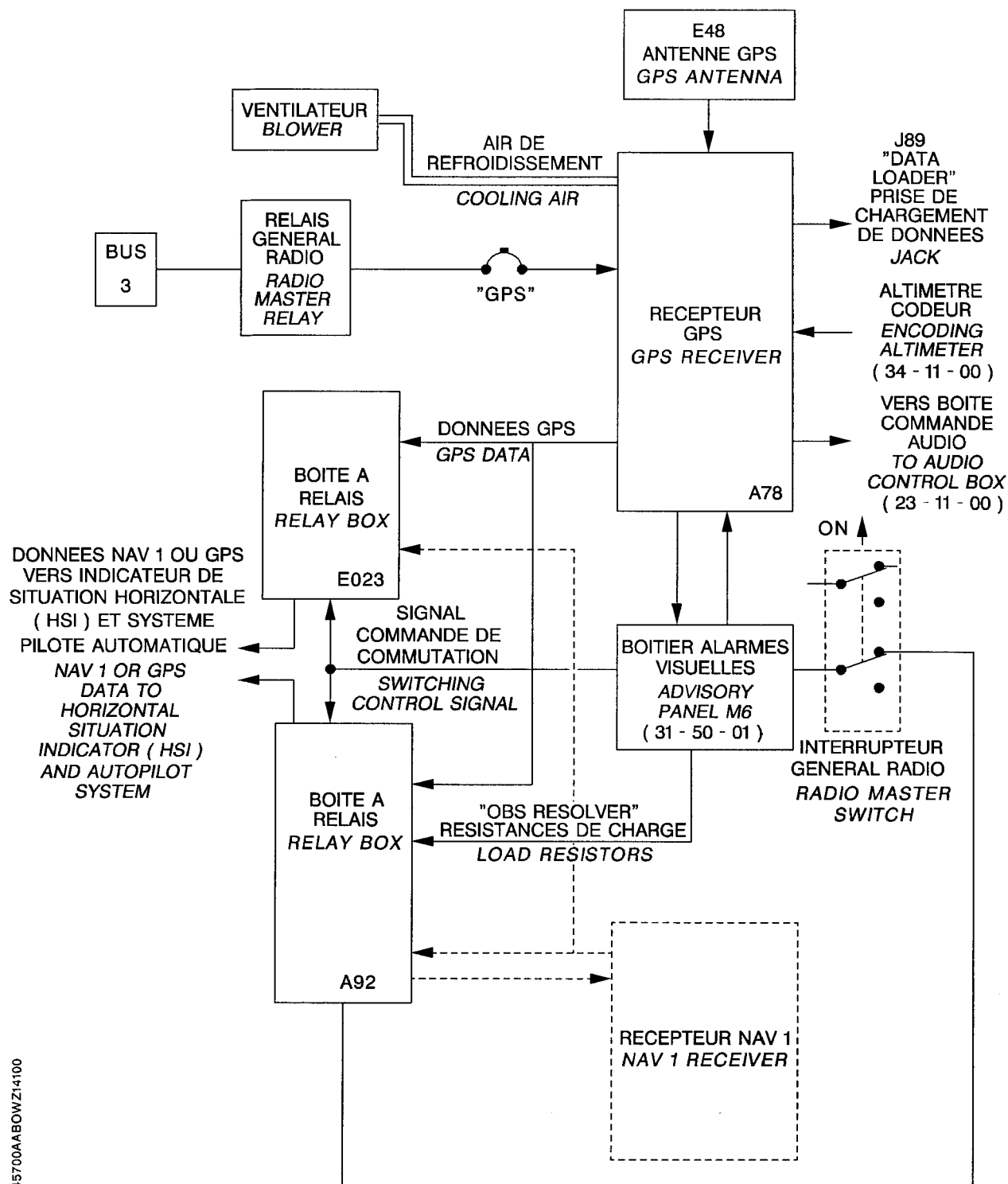
The GPS system is electrically supplied by "BUS 3" bar via the "GPS" circuit breaker.

ALAL

Validity : KLN 89B with HSI
NAV 1 / GPS switching

34-57-00 (EE)

Page 1
FEB 00



Global Positioning System (GPS) - Electrical schematic
Figure 1

ALAL

Validity : KLN 89B with HSI
NAV 1 / GPS switching

34-57-00 (EE)

Page 2
FEB 00

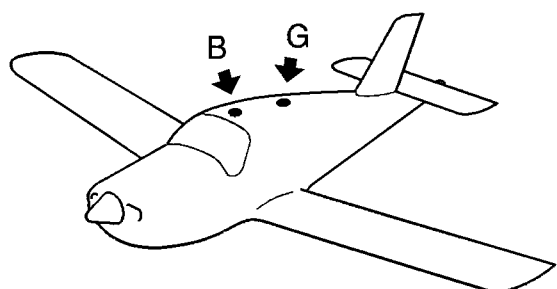
14345700AABOW/Z14100

2. LOCATION (Figures 2 and 3)

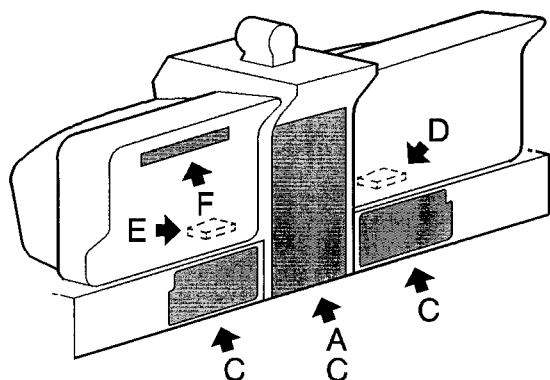
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-50-00
E48 GPS antenna	1	210	/	34-57-02
E023 relay box	1	250	Behind the R.H. instrument panel	34-57-05
A92 relay box	1	250	Behind the L.H. instrument panel	34-57-05
Filter	2	230	251L	34-57-00
Blower	1	230	211R	34-57-00
J89 "data loader" jack	1	254L or 254R or 251C	/	34-57-00
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - "GPS"	1	230	232L	WM

3. OPERATION

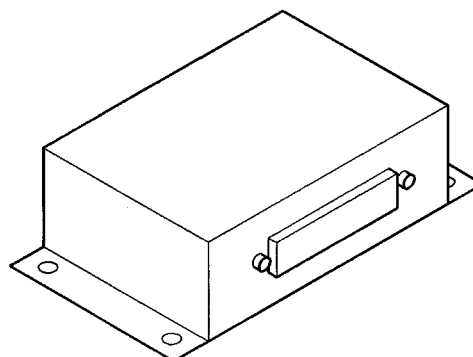
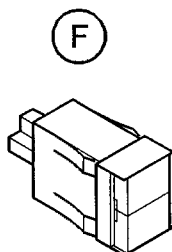
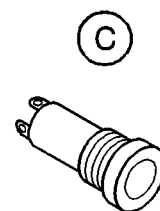
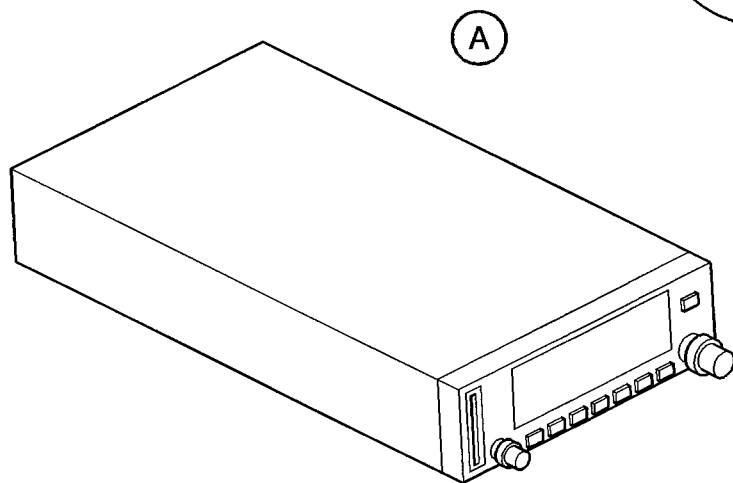
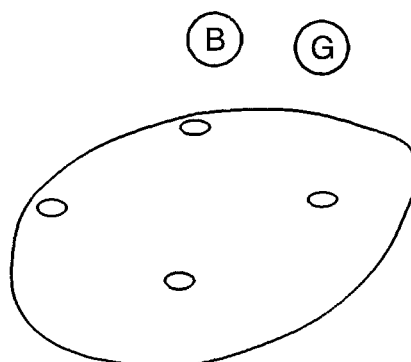
NOTE : For equipment operation and maintenance, refer to the supplier's Maintenance Manual.



- A - A78 GPS receiver
- B - E48 GPS antenna (Pre-MOD. 151)
- C - J89 "data loader" jack
- D - E023 relay box
- E - A92 relay box
- F - Switch / annunciators or annunciators
- G - E48 GPS antenna (Post-MOD. 151)



 Variante de localisation
Alternate location



M345700AAADWZ14001

Global Positioning System (GPS) - Identification and location of components
Figure 2

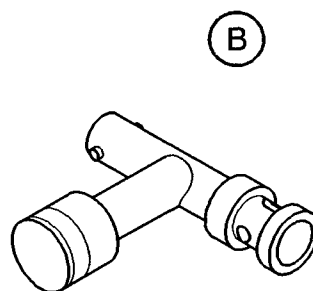
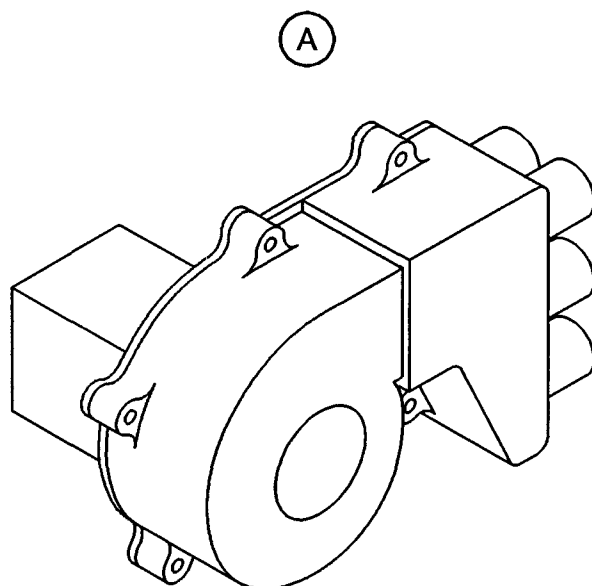
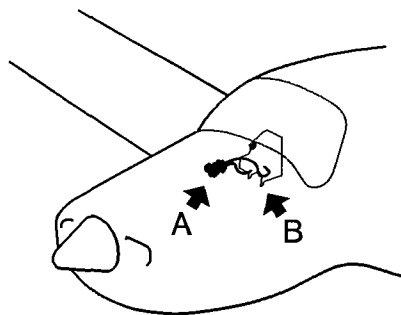
ALAL

Validity : KLN 89B with HSI
NAV 1 / GPS switching

34-57-00 (EE)

Page 4
NOV 01

A - Blower
B - Filter



14345700AAAPVZ4000

Global Positioning System (GPS) - Identification and location of components
Figure 3

ALAL

Validity : KLN 89B with HSI
NAV 1 / GPS switching

34-57-00 (EE)

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FEB 00

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ALAL

Validity : KLN 89B with HSI
NAV 1 / GPS switching

34-57-00 (EE) Page 6
FEB 00

GLOBAL POSITIONING SYSTEM (GPS)

DESCRIPTION AND OPERATION

1. GENERAL

The GPS is a satellite-based radionavigation system which enables an aircraft to be located anywhere (tridimensional positioning : latitude, longitude and altitude).

The system consists of :

- the A78 GPS receiver,
- the E48 GPS antenna,
- the configuration module (if installed),

Interfaced-with-HSI version

- the A92 relay box,
- the A93 relay box.

The system uses the horizontal situation indicator (HSI) of the heading reference system - refer to 34-21-00.

All

The system also uses annunciators/switches or indicator lights of M6 advisory panel - refer to 31-50-00.

The GPS receiver receives information from the following equipment :

- the fuel flow system (option) - refer to 73-30-00,
- the encoding altimeter (option) - refer to 34-11-00.

The GPS sends information to the following equipment :

- the A50 audio control panel - refer to 23-11-00,
- the M63 multifunction display (option) - refer to 34-62-00,
- the VHF NAV/COMM. (KX 155A or KX 165A) transceiver of NAV1 installation or NAV2 installation (option) - refer to 34-51-00 or 34-52-00.

The system is electrically supplied by "BUS 3" bar.

2. LOCATION (Figure 1)

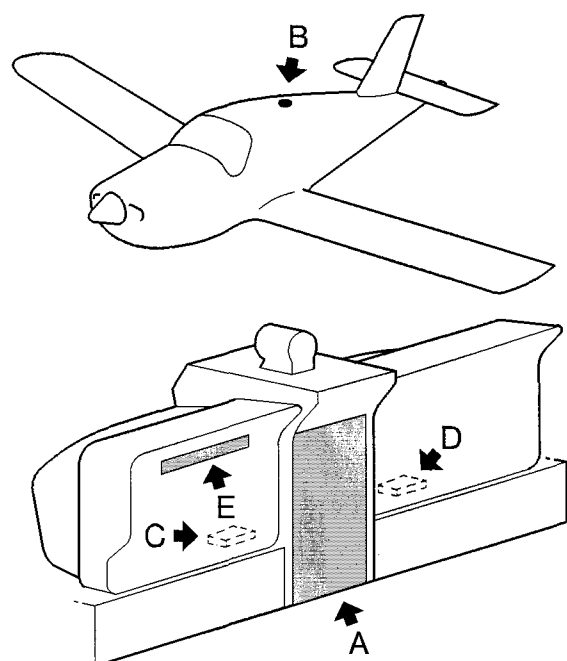
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
A78 GPS receiver	1	251C	/	34-50-00
E48 GPS antenna	1	240	/	34-57-02
A92 relay box (option)	1	250	/	34-57-05
A93 relay box (option)	1	250	/	34-57-05
Configuration module (if installed)	1	250	/	34-57-00

APAP

Validity : KLN 94 - Stand alone or
Interfaced with HSI

34-57-00 (EI)

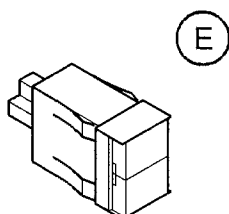
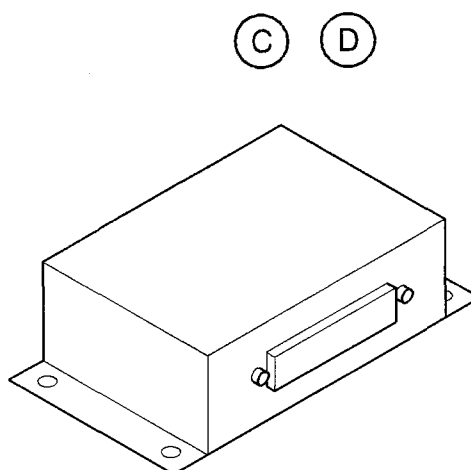
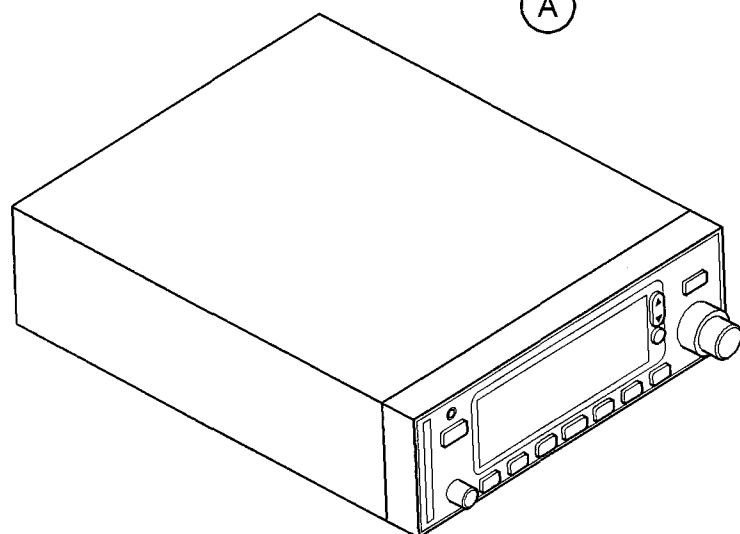
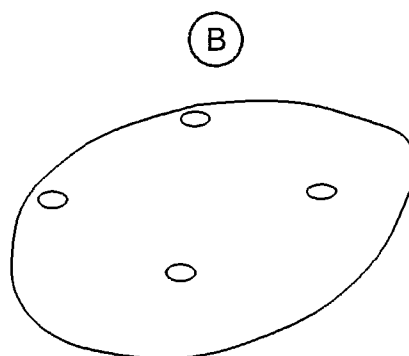
Page 1
JUN 04



- A - A78 GPS receiver
- B - E48 GPS antenna
- C - A92 relay box (option)
- D - A93 relay box (option)
- E - Annunciators/switches or indicator lights



Variante de localisation
Alternate location



Global Positioning System (GPS) - Identification and location of components
Figure 1

APAP

Validity : KLN 94 - Stand alone or
Interfaced with HSI

34-57-00 (EI)

Page 2
JUN 04

14345700AABRVZ4000

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M6 advisory panel	1	251L	/	31-50-01
Circuit breaker : - CB 194 "GPS" or "GPS1"	1	PL1	/	WM

3. DESCRIPTION

A. A78 GPS receiver (Figure 2)

The A78 GPS receiver can provide :

- permanent aircraft position-related information (longitude and latitude),
- guidance and navigation information display in relation to a flight plan defined by the pilot.

It also uses data stored in a database located in a data base card (1) inserted in the front panel of the equipment.

Mainly controlled by the two concentric knobs (7), the A78 GPS receiver can present a variety of information in a number of different page formats. One way to understand how the information are presented is to think of the receiver various display types as chapters in a book, with numbered pages each.

The outer knob changes the chapters when the cursor function is disabled and is used to move the cursor when the function is enabled. The inner knob turns the pages when the cursor function is disabled and is used to modify the data in inverse video over the cursor when the function is enabled.

To change data in a page, use the cursor function. This function is an inverse video area on the display obtained by pressing momentarily the "CRSR" pushbutton. Rotate the outer knob to position the cursor and the inner knob to select the desired characters. Repeat this step as many times as necessary and validate ("ENT" pushbutton).

The other front face buttons have the main following functions :

- the "RNG" pushbuttons (5) to modify the scale of the card displayed on the screen,
- the "D➔" pushbutton (10) provides access to the "Direct to" navigation operation mode towards a waypoint.
- the "MNU" pushbutton (4) provides access to a list of options inside MAP page
- the "CLR" pushbutton (9) enables the pilot to cancel the data displayed on the screen.
- the "ENT" pushbutton (8) enables the pilot to validate an operation or to store the data entered with the cursor function.
- the "PROC" pushbutton (3) enables the pilot to initiate the loading of departure, approach or arrival procedures,
- the "ALT" pushbutton (12) enables the pilot to select the two Altitude pages,
- the "MSG" pushbutton (14) enables the pilot, when "MSG" message appears on the display, to access a consultation page.
- the "OBS" pushbutton (13) enables the selection of the manual mode [OBS of the horizontal situation indicator (interfaced-with-HSI version)] or of the automatic mode (LEG) when sequencing the waypoints,

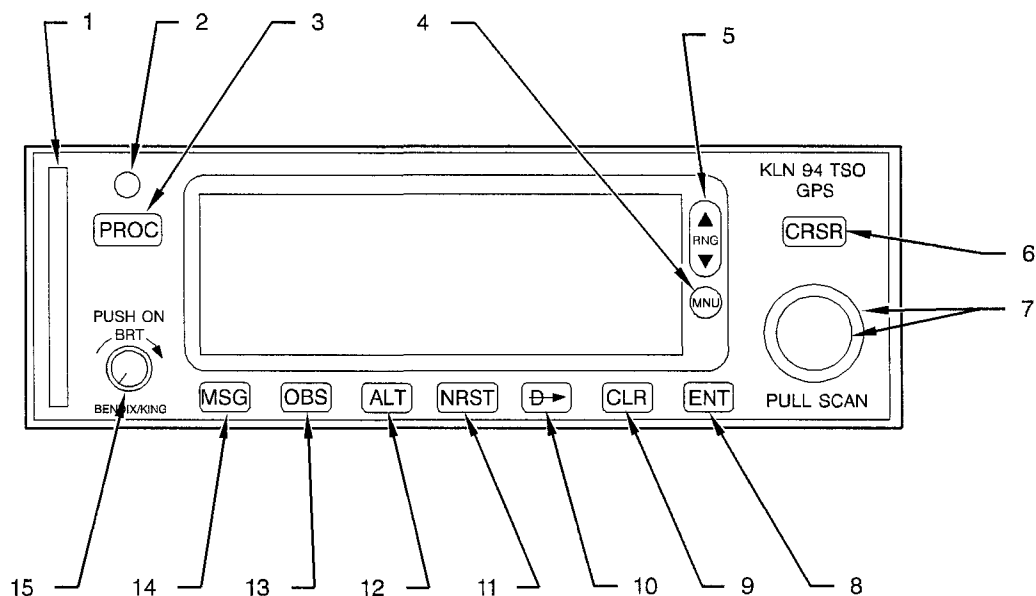
APAP

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- 1 - Data base card
- 2 - Connection jack
- 3 - "PROC" pushbutton
- 4 - "MNU" pushbutton
- 5 - "RNG" pushbutton
- 6 - "CRSR" pushbutton
- 7 - Concentric knobs
- 8 - "ENT" (Enter) pushbutton
- 9 - "CLR" (Clear) pushbutton
- 10 - "D→" (Direct to) pushbutton
- 11 - "NRST" (Nearest) pushbutton
- 12 - "ALT" (Altitude) pushbutton
- 13 - "OBS" pushbutton
- 14 - "MSG" (Message) pushbutton
- 15 - "PUSH ON" button



Global Positioning System (GPS) - A78 GPS receiver
Figure 2

14345700AABRVZ4100

APAP

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- the "NRST" pushbutton (11) is used to bring up a menu of the nearest functions (Airports, VORs, NDBs, Intersections,...) that may be selected.
- the "PUSH-ON" button (15) is used to energize the system and adjust the display brightness.
- the connection jack (2) enables to update the navigation database from a laptop computer.

The A78 GPS receiver is electrically supplied by "BUS 3" bar via CB 194 "GPS" or "GPS1" circuit breaker.

The A78 GPS receiver is mounted in the PL30 radio rack.

B. E48 GPS antenna

The E48 GPS antenna ensures the reception of the signals. It operates within the D band at the frequency of 1575.42 MHz.

It is a flat and small size antenna secured by means of four nuts.

The antenna is mounted on top of the fuselage between C3 and C4 frames.

C. A92, A93 relay boxes (option)

The A92, A93 relay boxes enable, by commutation, the NAV or GPS information to be displayed on the M73 Horizontal Situation Indicator.

Relay boxes are electrically supplied by "BUS 3" bar via the "NAV GPS" or "NAV1 GPS1" annunciator/switch of the advisory panel and protected by CB 194 "GPS" or "GPS1" circuit breaker.

Relay boxes are mounted on the front panel.

S/N 2207-9999

D. Configuration module

The configuration module enables to store the configuration data defined during the installation of the system on the aircraft. Data of configuration module are automatically used if the data contained in the internal memory of A78 GPS receiver are different from the module's data.

The configuration module is secured to the rear plate of GPS-receiver attachment rack.

4. OPERATION

The "RADIO MASTER" switch controls the energization of the whole radionavigation system.

At energization, the system automatically performs an internal test and displays a test page showing a course deviation indicator and other data. With the concentric knobs and the "ENT" pushbutton, fill in and/ or confirm successively the different displayed pages.

Interfaced-with-HSI version

The "NAV GPS" or "NAV1 GPS1" annunciator/switch of the advisory panel enables to select NAV or GPS information displayed on the M73 horizontal situation indicator. The indicator lights paired with the annunciator/switch identify the type of information displayed by the indicator. The GPS receiver converts GPS navigation information into DC signals, to actuate the vertical pointer, the "TO/FR" indicator and the warning flag of the indicator. If installed, the autopilot also receives the navigation information.

APAP

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■ All

On the advisory panel, the GPS dedicated indicator lights are directly controlled by the receiver to inform or alert the pilot of a situation requiring his attention.

When the GPS receiver operates in Altitude mode, it generates an aural alert which is transmitted to A50 audio control panel.

The fuel management pages of the GPS receiver use data from the fuel flow system (if installed). Data are transmitted in RS 232 format.

A multifunction display (if installed) enables, via a RS232 type link, the GPS flight management to be displayed.

Via a RS232 type link, the GPS receiver, when it is connected to compatible VHF NAV/COMM. transceivers (KX 155A, KX 165A) can provide a selection of NAV and COMM. frequencies to directly control these equipment.

GLOBAL POSITIONING SYSTEM (GPS)

ADJUSTMENT / TEST

1. OPERATIONAL TEST OF THE GLOBAL POSITIONING SYSTEM

A. Tools and consumable material

- Ground power unit

B. Procedure

- 1) If the COMM./NAV-ILS/GPS transceiver has been replaced, program first the global positioning system.
- 2) Park the aircraft on a clear area.
- 3) Make sure that the main switch-breaker is open.
- 4) Connect the ground power unit – refer to 24-40-00.
- 5) Make sure that the COMM./NAV-ILS/GPS transceiver is not energized (turn ".C" button counterclockwise to the stop).
- 6) Close main switch-breaker.
- 7) Set the radio master switch to "ON".
- 8) Perform the following tests :

ACTION	RESULT
(1) Energize the COMM./NAV-ILS/GPS transceiver (turn ".C" button clockwise)	(a) The welcome display page appears. The equipment performs an automatic test. (b) Another display page about the validity of the database card appears.
(2) Momentarily press the "ENT" pushbutton.	(a) The display page on the database card disappears. (b) A display page about the situation of satellites appears. NOTE : The page displays the received identification numbers of satellites and the relative amplitude of signals. NOTE : When the acquisition of satellites requires more time, "Searching Sky" annunciation appears on the display and "MSG" indicator light flashes.
(3) If "MSG" indicator light flashes, momentarily press the "MSG" pushbutton.	(a) A page of messages appears, which displays information about the situation or alert information about the operation in progress.

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ACTION

RESULT

(4) If the page of messages is displayed, momentarily press "ENT" pushbutton.

(a) The previous page appears.

(5) De-energize the COMM./NAV-ILS/GPS transceiver (turn ".C" button counterclockwise to the stop).

9) Set the radio master switch to "OFF".

10) Open main switch-breaker.

11) Disconnect the ground power unit – refer to 24-40-00.

2. CONFIGURATION OF THE GLOBAL POSITIONING SYSTEM

A. Tools and consumable material

- Ground power unit

B. Procedure

- 1) To configure the COMM./NAV-ILS/GPS transceiver, refer to installation manual "400 SERIES INSTALLATION MANUAL" Reference 190-00140-02 at the latest revision.
- 2) The following tables define the parameters programmed in the equipment at the aircraft delivery depending on the installed option.

NOTE : In a table, for the blank cell, leave by default the existing data.

MAIN ARINC 429 CONFIG page		
	SPEED	DATA
IN 1	/	OFF
IN 2	/	OFF
OUT	/	OFF
SDI	/	OFF

MAIN RS 232 CONFIG page		
	INPUT	OUTPUT
CHAN 1	OFF	OFF
CHAN 2	OFF	OFF
CHAN 3	OFF	OFF
CHAN 4	OFF	OFF

MAIN LIGHTING page		
	DISPLAY	KEY
LIGHTING	XXXX	XXXX
SOURCE	PHOTO	28V DC
RESPONSE TIME	4	4
SLOPE	50	50
MINIMUM	080	080
OFFSET	50	50

DATE/TIME SETUP page	
UTC DATE	UTC TIME
Enter UTC (Universal Time Coordinated) date	Enter UTC time

MAIN DISCRETE INPUTS page
Make sure the displayed decoded altitude is correct

MAIN CDI/OBS CONFIG page
Perform OBS calibration of the CDI/HSI with the "SELECTED COURSE" field

COM SETUP page	
SPACING	25.0 KHz
Store Calibration ?	Select the field and press "ENT"

VOR/LOC/GS CDI page
Perform CDI calibration with the "SELECTED COURSE" field

Pages configuration – OPT10-23-003-A
Table 501

MAIN ARINC 429 CONFIG page		
	SPEED	DATA
IN 1	/	OFF
IN 2	/	OFF
OUT	/	OFF
SDI	/	

MAIN RS 232 CONFIG page		
	INPUT	OUTPUT
CHAN 1	OFF	OFF
CHAN 2	OFF	OFF
CHAN 3	CROSSFILL (IF GPS#1 400-series or 500-series GNS)	CROSSFILL (IF GPS#1 400-series or 500-series GNS)
CHAN 4	OFF	OFF

MAIN LIGHTING page		
	DISPLAY	KEY
LIGHTING	XXXX	XXXX
SOURCE	PHOTO	28V DC
RESPONSE TIME	4	4
SLOPE	50	50
MINIMUM	080	040
OFFSET	50	50

DATE/TIME SETUP page	
UTC DATE	UTC TIME
Enter UTC (Universal Time Coordinated) date	Enter UTC time

MAIN DISCRETE INPUTS page
Make sure the decoded altitude displayed on display is correct

MAIN CDI/OBS CONFIG page
Perform OBS calibration of CDI/HSI with the "SELECTED COURSE" field

COM SETUP page	
SPACING	25,0 KHz
Store Calibration ?	Select the field and press "ENT"

VOR/LOC/GS CDI page
Perform CDI calibration with the "SELECTED COURSE" field

Pages configuration – OPT10-23-004 -A
Table 501A

MAIN ARINC 429 CONFIG page		
	SPEED	DATA
IN 1	LOW	OFF
IN 2	LOW	OFF
OUT	LOW	OFF or GAMA 429 (1)
SDI	COMMON	

MAIN RS 232 CONFIG page		
	INPUT	OUTPUT
CHAN 1	OFF or SHADIN FUEL (2)	OFF or AVIATION (2)
CHAN 2	OFF	OFF
CHAN 3	OFF or CROSSFILL (3)	OFF or CROSSFILL (3)
CHAN 4	OFF	OFF

MAIN LIGHTING page		
	DISPLAY	KEY
LIGHTING	XXXX	XXXX
SOURCE	PHOTO	28V DC
RESPONSE TIME	4	4
SLOPE	50	50
MINIMUM	080	040
OFFSET	50	50

DATE/TIME SETUP page	
UTC DATE	UTC TIME
Enter UTC (Universal Time Coordinated) date	Enter UTC time

MAIN DISCRETE INPUTS page
Make sure the displayed decoded altitude is correct

MAIN DISCRETE OUTPUTS page
Check the relevant indicator lights for correct operation

MAIN CDI/OBS CONFIG page
Perform OBS calibration of CDI/HSI with the "SELECTED COURSE" field

COM SETUP page	
SPACING	25,0 KHz
Store Calibration ?	Select the field and press "ENT"

VOR/LOC/GS CDI page	
Perform CDI calibration with the "SELECTED COURSE" field	
DME CHNL MODE	King Serial

Pages configuration – OPT10-23-006-A

Table 501B

- (1) "GAMA 429" with A/P KFC225.
- (2) "Shadin Fuel - Aviation" with OPT. SHADIN (Microflo-L) and/or OPT. KMD 550.
- (3) "CROSSFILL - CROSSFILL" with OPT. GNS430 # 2.

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GLOBAL POSITIONING SYSTEM (GPS)

ADJUSTMENT / TEST

1. OPERATIONAL TEST OF THE GLOBAL POSITIONING SYSTEM

A. Tools and consumable material

- Ground power unit

B. Procedure

- 1) Park the aircraft on a clear area.
- 2) Make sure that the main switch-breaker is open.
- 3) Connect the ground power unit – refer to 24-40-00.
- 4) Make sure the A78 GPS receiver is not energized ("PUSH-ON" button in pulled-out position).
- 5) Close the main switch-breaker.
- 6) Set the radio master switch to "ON".

Interfaced-with-HSI version

- 7) If necessary, select GPS function on the HSI indicator with the "NAV GPS" or "NAV1 GPS1" annunciator/switch of the advisory panel.

All

- 8) Press "PUSH-ON" button of GPS receiver to energize it.

NOTE : The GPS receiver performs a complete internal test and displays a test page.

- 9) Turn "PUSH-ON" button to adjust the display brightness to the desired level.
- 10) On the test page, make sure that :
 - the distance field displays 34.5 NM,
 - the "OBS" field displays 180° ,
 - the "RMI" field displays 130° ,
 - the "ANNUN ON" message appears,
 - the course deviation indicator shows a half-scale deviation to the right,
- 11) On the advisory panel, make sure all GPS dedicated indicator lights are on.

Interfaced-with-HSI version

- 12) With the "NAV GPS" or "NAV1 GPS1" annunciator/switch of the advisory panel, select NAV function on HSI indicator. Make sure "NAV" or "NAV1" annunciation is illuminated on the annunciator/switch.
- 13) Select again the GPS function on the HSI indicator. Make sure "GPS" or "GPS1" annunciation is illuminated on the annunciator/switch.
- 14) On the Horizontal Situation Indicator, make sure that :
 - the deviation bar shows a half-scale deviation to the right,
 - the TO/FR indicator shows FROM.

ABAB

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Interfaced with HSI

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■ All

- 15) To exit the test page, use if necessary the concentric knobs to position the cursor on "OK?" of "PASS" field and momentarily press the "ENT" pushbutton.
- 16) De-energize the GPS receiver.
- 17) Set the radio master switch to "OFF".
- 18) Open the main switch-breaker.
- 19) Disconnect the ground power unit - refer to 24-40-00.

2. CONFIGURATION OF THE GLOBAL POSITIONING SYSTEM

A. Tools and consumable material

- None

B. Procedure

To configure the GPS receiver, refer to HONEYWELL Installation Manual, Reference 006-10599-0001 "KLN 94 GPS navigation system" at the latest revision.

■ Tables 501 define the parameters programmed in the equipment at the aircraft delivery depending on the installed option.

First MNT1 maintenance page	
IFR/VFR	IFR
IFR Apr/Enr	Enr
ALT alt	Disable (if A/P option installed)

Second MNT1 maintenance page (if Fuel Management option)	
Fuel Mgt Sys	Yes
Fuel Mgt Ind	Yes
Full Fuel	Blank

Third MNT1 maintenance page	
232 Air Data	No
Emerg Bat	No
Use Bat	Blank

MNT2 maintenance page	
Not configurable	

MNT3 maintenance page	
Refer to Installation Manual to adjust the OBS of the HSI or of the indicator	

MNT4 maintenance page	
Alert Volt	22V
Alert Delay	30S

MNT5 maintenance page	
Configure the "Quicktune" output towards COM/NAV 1 installation (If compatible with KX 155A or KX 165A)	

MNT6 maintenance page "Choice 2"	
Annun :	TERM
	APR

MNT7 maintenance page	
Select the "RS232 standard " serial output (with SHADIN flowmeter)	

Page configuration – OPT10-34-301-A
Table 501

First MNT1 maintenance page	
IFR/VFR	VFR
IFR Apr/Enr	--
ALT alt	Disable (if A/P option installed)

Second MNT1 maintenance page (if Fuel Management option)	
Fuel Mgt Sys	Yes
Fuel Mgt Ind	Yes
Full Fuel	Blank

Third MNT1 maintenance page	
232 Air Data	No
Emerg Bat	No
Use Bat	Blank

MNT2 maintenance page	
Not configurable	

MNT3 maintenance page	
Not configurable	

MNT4 maintenance page	
Alert Volt	22V
Alert Delay	30S

MNT5 maintenance page	
Configure the "Quicktune" output towards COM/NAV 1 installation (If compatible with KX 155A or KX 165A)	

MNT6 maintenance page "Choice 2"	
Not configurable	

MNT7 maintenance page	
Select the "RS232 standard" serial output (with SHADIN flowmeter)	

Page configuration – OPT10-34-306-A
Table 501A

GLOBAL POSITIONING SYSTEM (GPS)

ADJUSTMENT / TEST

1. OPERATIONAL TEST OF THE GLOBAL POSITIONING SYSTEM

A. Tools and consumable material

- Ground power unit

B. Procedure

- 1) If the COMM./NAV-ILS/GPS transceiver has been replaced, program first the global positioning system.
- 2) Park the aircraft on a clear area.
- 3) Make sure that the main switch-breaker is open.
- 4) Connect the ground power unit - refer to 24-40-00.
- 5) Make sure that the COMM./NAV-ILS/GPS transceiver is not energized (turn ".C" button counterclockwise to the stop).
- 6) Close main switch-breaker.
- 7) Set the radio master switch to "ON".
- 8) Perform the following tests :

ACTION

RESULT

- (1) Energize the COMM./NAV-ILS/GPS transceiver (turn ".C" button clockwise).

- (a) The welcome display page appears.
The equipment performs an automatic test.
- (b) Another display page about the validity of the database card appears.

- (2) Momentarily press the "ENT" pushbutton to enable the display page.

- (a) The display page "Instrument Panel Self-test" appears.

NOTE : Compare the indications on the display page "Instrument Panel Self-Test" to the indications displayed on the instruments connected to COMM./NAV-ILS/GPS transceiver (CDI, HSI, annunciators...).

ACTION

RESULT

- (3) Momentarily press the "ENT" pushbutton to enable the display page.

- (a) A display page about the situation of satellites appears.

NOTE : The page displays the received identification numbers of satellites and the relative amplitude of signals.

NOTE : When the acquisition of satellites requires more time, "Searching Sky" annunciation appears on the display and "MSG" indicator light flashes.

- (4) If "MSG" indicator light flashes, momentarily press the "MSG" pushbutton.

- (a) A page of messages appears, which displays information about the situation or alert information about the operation in progress.

- (5) If the page of messages is displayed, momentarily press "ENT" pushbutton.

- (a) The previous page appears.

- (6) De-energize the COMM./NAV-ILS/GPS transceiver (turn ".C" button counterclockwise to the stop).

- 9) Set the radio master switch to "OFF".
10) Open main switch-breaker.
11) Disconnect the ground power unit - refer to 24-40-00.

2. CONFIGURATION OF THE GLOBAL POSITIONING SYSTEM

A. Tools and consumable material

- Ground power unit

B. Procedure

- 1) To configure the COMM./NAV-ILS/GPS transceiver, refer to installation manual "500 SERIES INSTALLATION MANUAL" Reference 190-00181-02 at the latest revision.
- 2) Table 501 hereafter defines the parameters programmed in the equipment at the aircraft delivery depending on the installed option.

NOTE : In a table, for the blank cells, leave by default the existing data.

MAIN ARINC 429 CONFIG page		
	SPEED	DATA
IN 1	LOW	OFF
IN 2	LOW	OFF
OUT Without autopilot option If autopilot option KFC225 If autopilot option KAP150-KFC150	LOW LOW LOW	OFF GAMA 429 OFF
SDI	COMMON	

MAIN RS 232 CONFIG page		
	INPUT	OUTPUT
CHAN 1 Without SHADIN flowmeter With SHADIN flowmeter	OFF SHADIN Fuel	OFF Aviation
CHAN 2	OFF	OFF
CHAN 3 Without GNS#2 option With GNS#2 option	OFF CROSSFILL	OFF CROSSFILL
CHAN 4 Without WX500 option With WX500 option	OFF WX-500	OFF WX-500
CHAN 5	OFF	OFF
CHAN 6	OFF	OFF

Pages configuration – OPT10-23-007-A
Table 501

MAIN LIGHTING CONFIG page		
	DISPLAY	KEY
LIGHTING	XXXX	XXXX
SOURCE	PHOTO	28V DC
RESPONSE TIME / MIN	4 / 080	4 / 040
SLOPE / OFFSET	50 / 50	50 / 50

DATE/TIME SETUP page	
UTC DATE	UTC TIME
Enter UTC (Universal Time Coordinated) date	Enter UTC time

MAIN DISCRETE I (inputs) page
Make sure the displayed decoded altitude is correct

MAIN DISCRETE O (outputs) page
Make sure the related annunciators are serviceable

MAIN CDI/OBS CONFIG page
Perform OBS calibration of the CDI/HSI with the "SELECTED COURSE" field

COM SETUP page	
SPACING	25.0 KHz
Store Calibration ?	Select the field and press "ENT"

VOR/LOC/GS CDI page	
DME CHANNEL CODE	KING SERIAL

Pages configuration – OPT10-23-007-A
Table 501

E48 GPS ANTENNA MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - GPS ANTENNA (Figures 201 and 201A)

A. Tools and consumable materials

- Sealant (TB 09-903)
- Plastic scraper
- Cleaning agent (TB 11-912)
- Clean lintfree cloths

B. Removal of GPS antenna

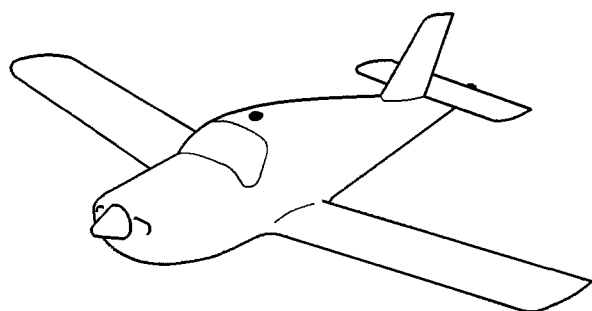
- 1) Make sure that the main switch-breaker is open.
- 2) Remove the sealant ensuring tightness around screws (4).
- 3) Using a plastic scraper, remove the sealant bead applied around the antenna.
- 4) Remove screws (4).
- 5) Sufficiently clear GPS antenna (1) to reach connector (2).

NOTE : Keep the antenna cable outside the fuselage when the antenna is removed.

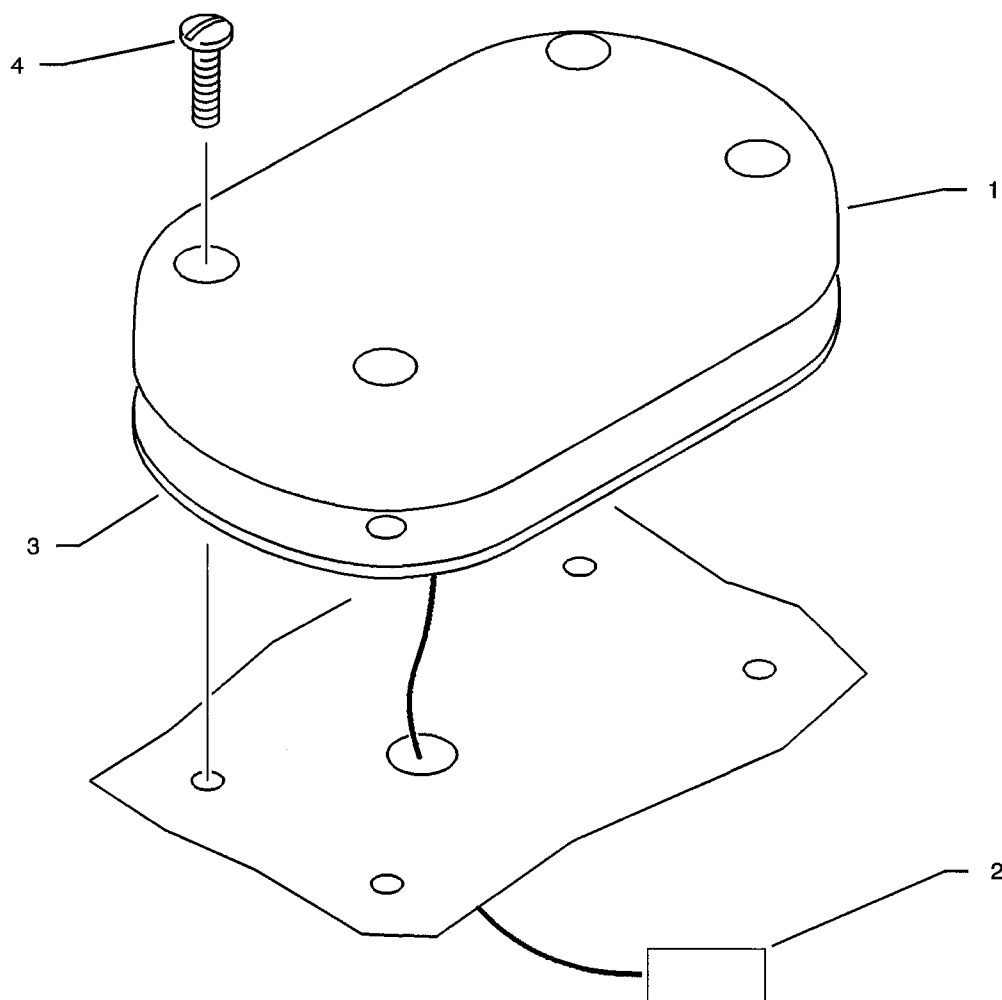
- 6) Disconnect connector (2).
- 7) Remove GPS antenna (1) and gasket (3).
- 8) Remove any sealant residues on the fuselage.
- 9) Remove any sealant residues from inside the holes of screws (4).

C. Installation of GPS antenna

- 1) Make sure that the main switch-breaker is open.
- 2) Clean the aircraft skin in contact with GPS antenna (1) base with a clean lintfree cloth moistened with cleaning agent (TB 11-912). Wipe with a dry cloth.
- 3) Position gasket (3) on GPS antenna (1).
- 4) Connect connector (2).
- 5) Position and secure GPS antenna (1) equipped with the gasket with screws (4).
- 6) Seal the four passage holes of screws (4) with sealant (TB 09-903).
- 7) Apply a bead of sealant (TB 09-903) around the antenna / fuselage junction.
- 8) Perform an operational test of the GPS system.

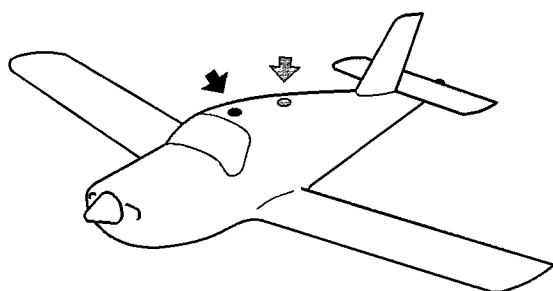


- 1 - GPS antenna
- 2 - Connector
- 3 - Gasket
- 4 - Screw



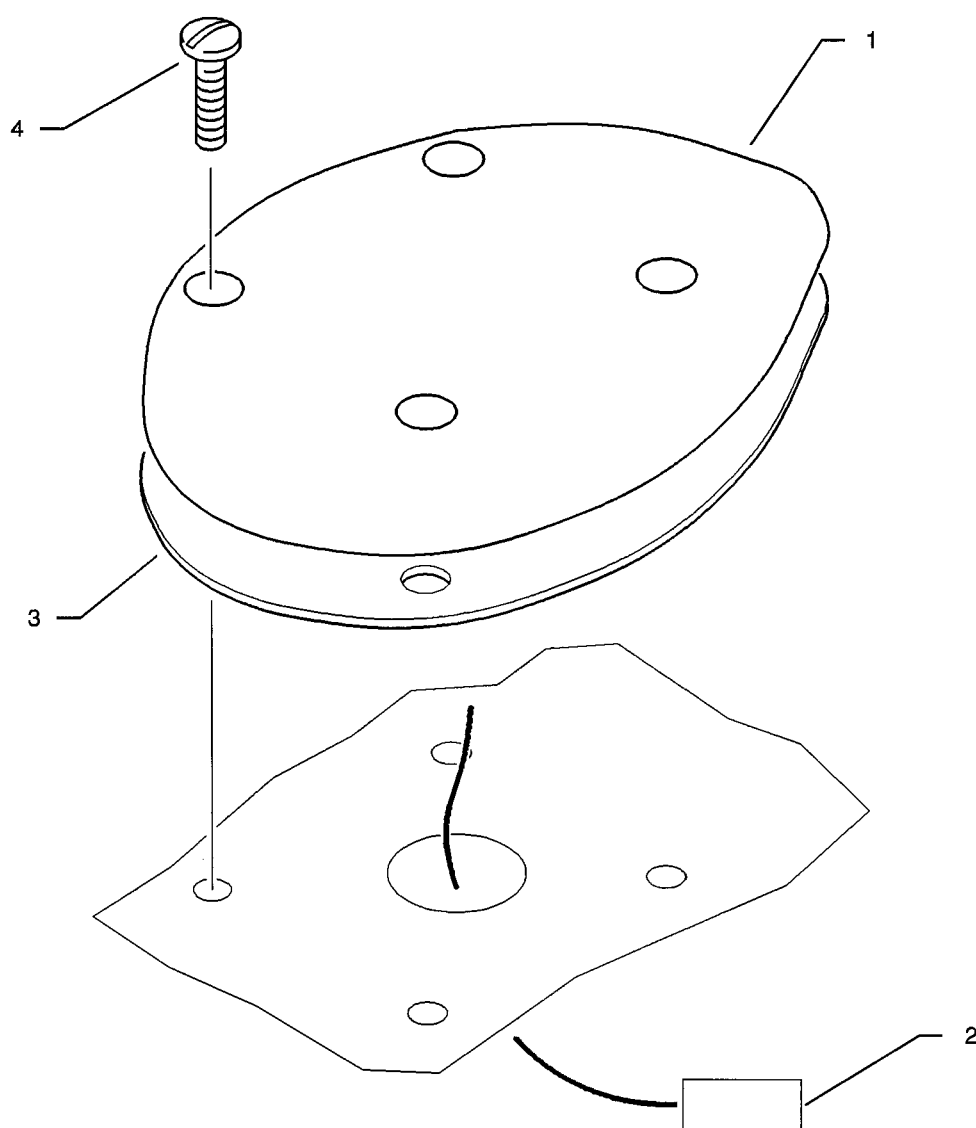
E48 GPS antenna - Removal / Installation
Figure 201 - KA 91

I4345702AAAABVZ4000



- 1 - GPS antenna
- 2 - Connector
- 3 - Gasket
- 4 - Screw

 Variante de localisation
Alternate location



I4345702AAABVZ4101

E48 GPS antenna - Removal / Installation
Figure 201A - KA 92

AAAA
Validity : All KLN 89/90/94

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E48 GPS ANTENNA

MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - GPS ANTENNA (Figures 201 and 201A)

A. Tools and consumable materials

- Sealant (TB 09-903)
- Plastic scraper
- Cleaning agent (TB 11-003)
- Clean lintfree cloths

B. Removal of GPS antenna

- 1) Make sure that the main switch-breaker is open.

Aircraft equipped with upper duct upholstery 241

- 2) Remove the radio loudspeaker grille.
- 3) Remove the radio loudspeaker to gain access to the upper duct central attachment.
- 4) Remove the screw and the washer of the upper duct central attachment.
- 5) Hold the upper duct upholstery and remove the front and rear attachment screws and washers.
- 6) Sufficiently clear the upper duct upholstery to gain access to connector (3).

NOTE : For the remaining operations, hold the upper duct upholstery suspended by an appropriate means to avoid overstressing the electrical wires.

Aircraft not equipped with upper duct upholstery 241

- 2) If antenna cover upholstery (6) is installed, remove screws (7), washers (8) and antenna cover upholstery (6).
- 3) Remove screws (9), washers (10) and GPS antenna cover (5).

All

- 7) Using a plastic scraper, remove the sealant bead applied around the antenna.
- 8) Disconnect connector (3).
- 9) Remove and discard nuts (4).
- 10) Remove GPS antenna (1) and gasket (2).
- 11) Remove any sealant residues on the fuselage and on GPS antenna (1).

C. Installation of GPS antenna

- 1) Make sure that the main switch-breaker is open.
- 2) Using a clean lintfree cloth soaked with cleaning agent (TB 11-003), clean the skin area in contact with the base of GPS antenna (1). Wipe with a dry cloth.

- 3) Position gasket (2) on GPS antenna (1).
- 4) Position and secure GPS antenna (1) equipped with the gasket with new nuts (4).
- 5) Connect connector (3).

Aircraft equipped with upper duct upholstery 241

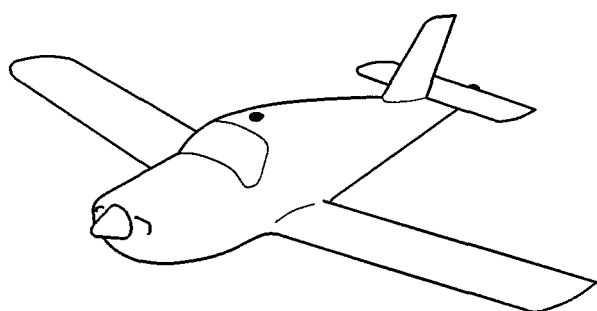
- 6) Position and secure upper duct upholstery.
- 7) Connect and secure the radio loudspeaker.
- 8) Install the grille of the radio loudspeaker.

Aircraft not equipped with upper duct upholstery 241

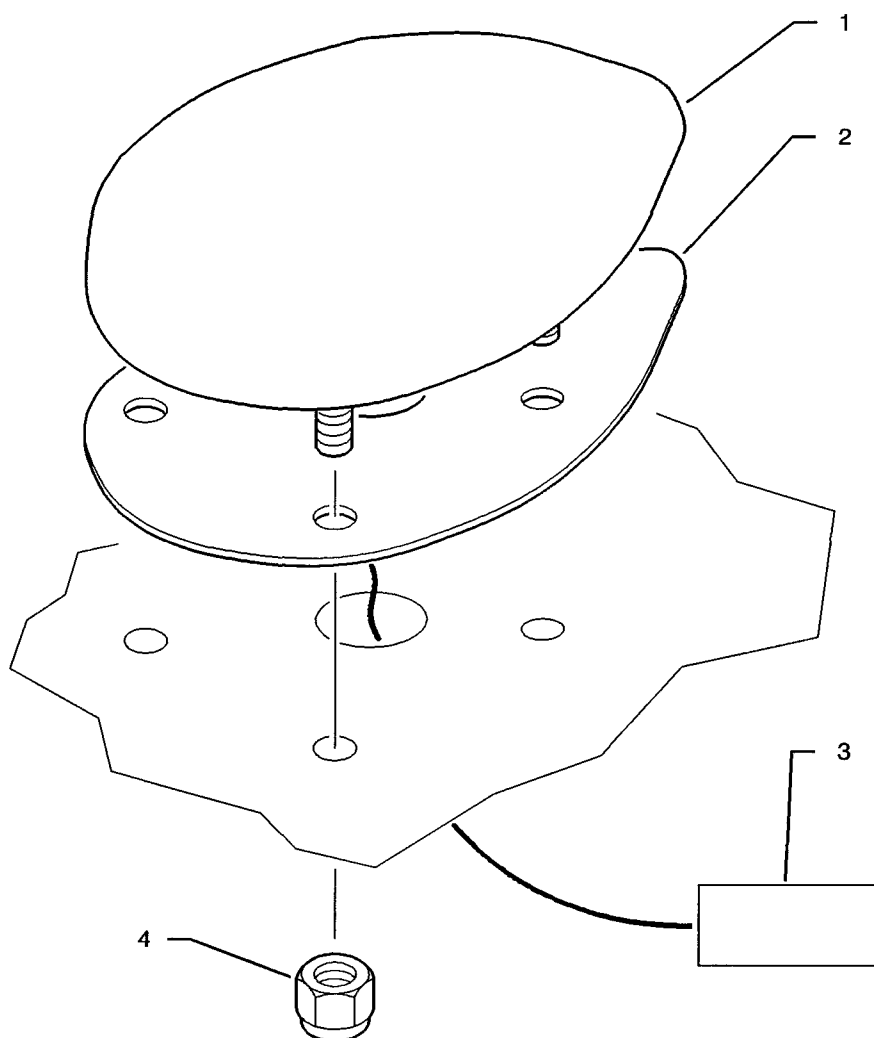
- 6) Position and secure GPS antenna cover (5) with screws (9) and washers (10).
- 7) If removed, position and secure antenna cover upholstery (6) with screws (7) and washers (8).

All

- 9) Apply a bead of sealant (TB 09-903) around the antenna / fuselage junction.
- 10) Perform an operational test of the GPS system.

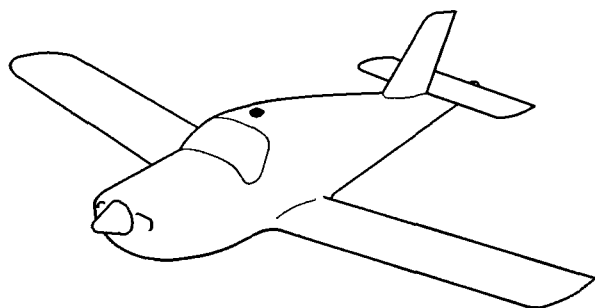


- 1 - GPS antenna
- 2 - Gasket
- 3 - Connector
- 4 - Nut

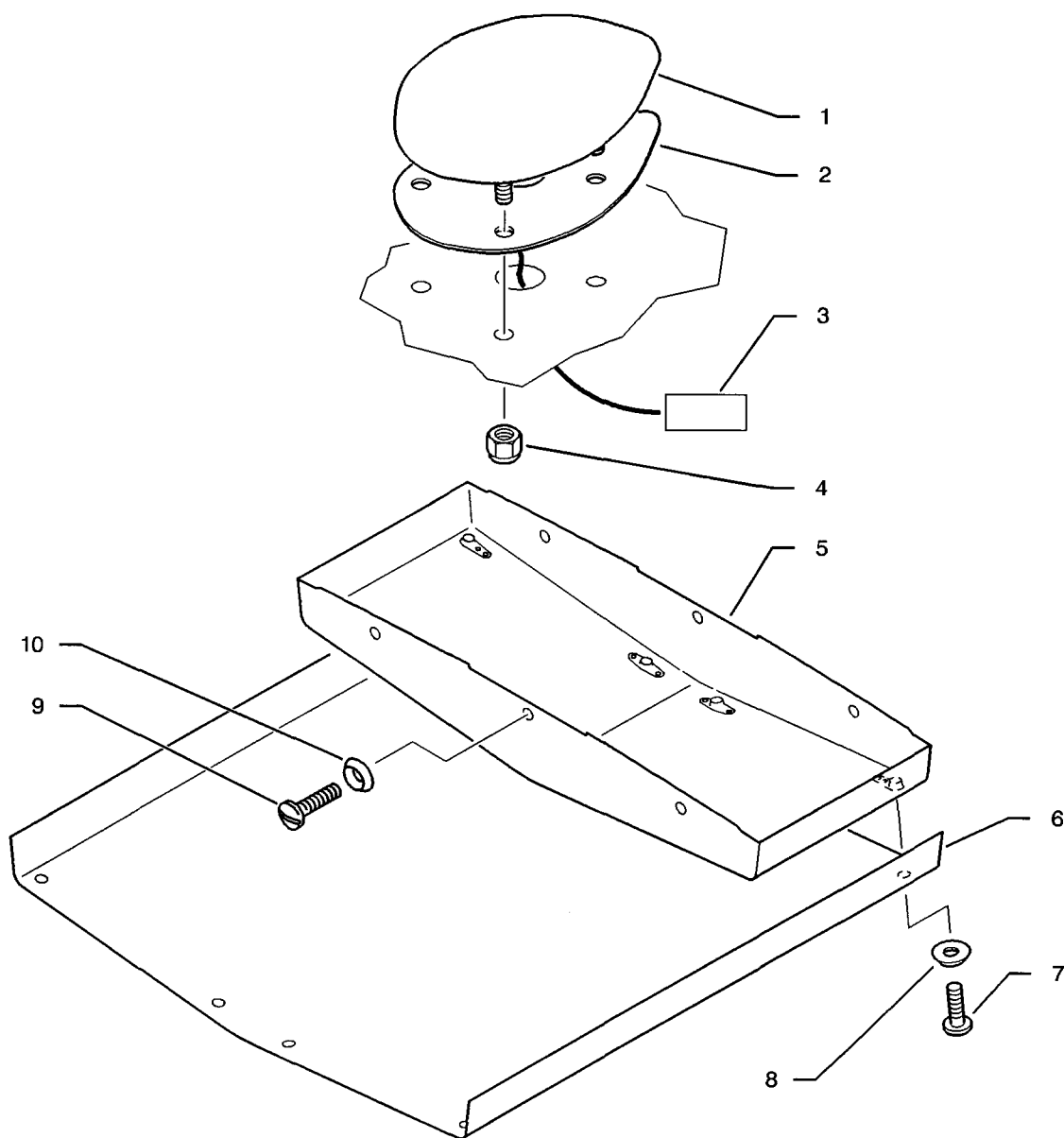


I4345702AAABVZ4200

GPS antenna - Removal / Installation
Figure 201 - With upper duct upholstery



- 1 - GPS antenna
- 2 - Gasket
- 3 - Connector
- 4 - Nut
- 5 - GPS antenna cover
- 6 - Antenna cover upholstery
- 7 - Screw
- 8 - Washer
- 9 - Screw
- 10 - Washer



14345702AAABVZ14000

GPS antenna - Removal / Installation
Figure 201A - Without upper duct upholstery

E48 / E49 GPS ANTENNA

MAINTENANCE PRACTICES

1. SERVICING

None

2. REMOVAL / INSTALLATION - GPS ANTENNA (Figure 201)

A. Tools and consumable materials

- Sealant (TB 09-903)
- Plastic scraper
- Cleaning agent (TB 11-912)
- Clean lintfree cloths

B. Removal of GPS antenna

- 1) Make sure that the main switch-breaker is open.
- 2) Using a plastic scraper, remove the sealant bead applied around the antenna.

E49 GPS antenna

- 3) Remove 241A rear overhead panel.

E48 GPS antenna

- 3) Hold 241F overhead panel and remove the front and rear attachment screws and washers.
- 4) Sufficiently clear the overhead panel to gain access to connector (3).

NOTE : For the remaining operations, hold the overhead panel suspended by an appropriate means to avoid overstressing the electrical wires.

All

- 5) Disconnect connector (3).
- 6) Remove and discard nuts (4).
- 7) Remove GPS antenna (1) and gasket (2).
- 8) Remove any sealant residues on the fuselage and on GPS antenna (1).

C. Installation of GPS antenna

- 1) Make sure that the main switch-breaker is open.
- 2) Using a clean lintfree cloth soaked with cleaning agent (TB 11-912), clean the skin area in contact with the base of GPS antenna (1). Wipe with a dry cloth.
- 3) Position gasket (2) on GPS antenna (1).
- 4) Position and secure GPS antenna (1) equipped with the gasket with new nuts (4).
- 5) Connect connector (3).

E49 GPS antenna

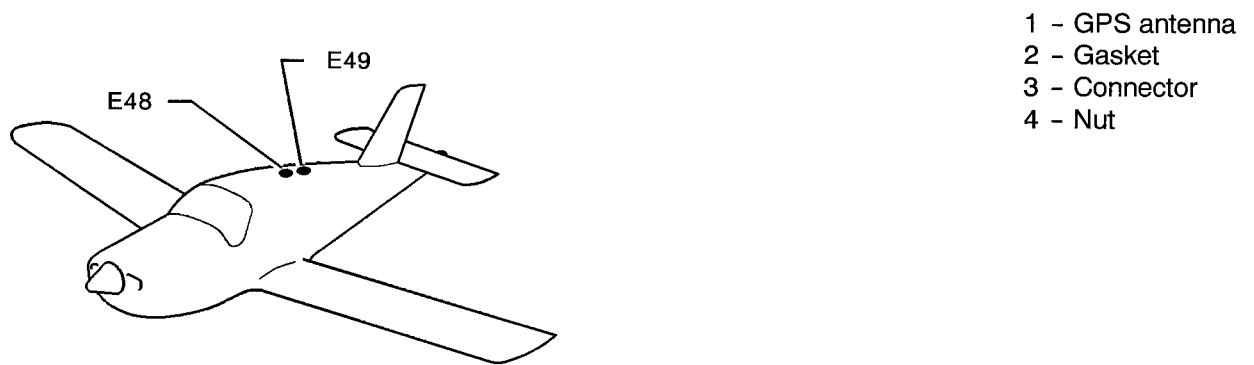
- 6) Install 241A rear overhead panel.

E48 GPS antenna

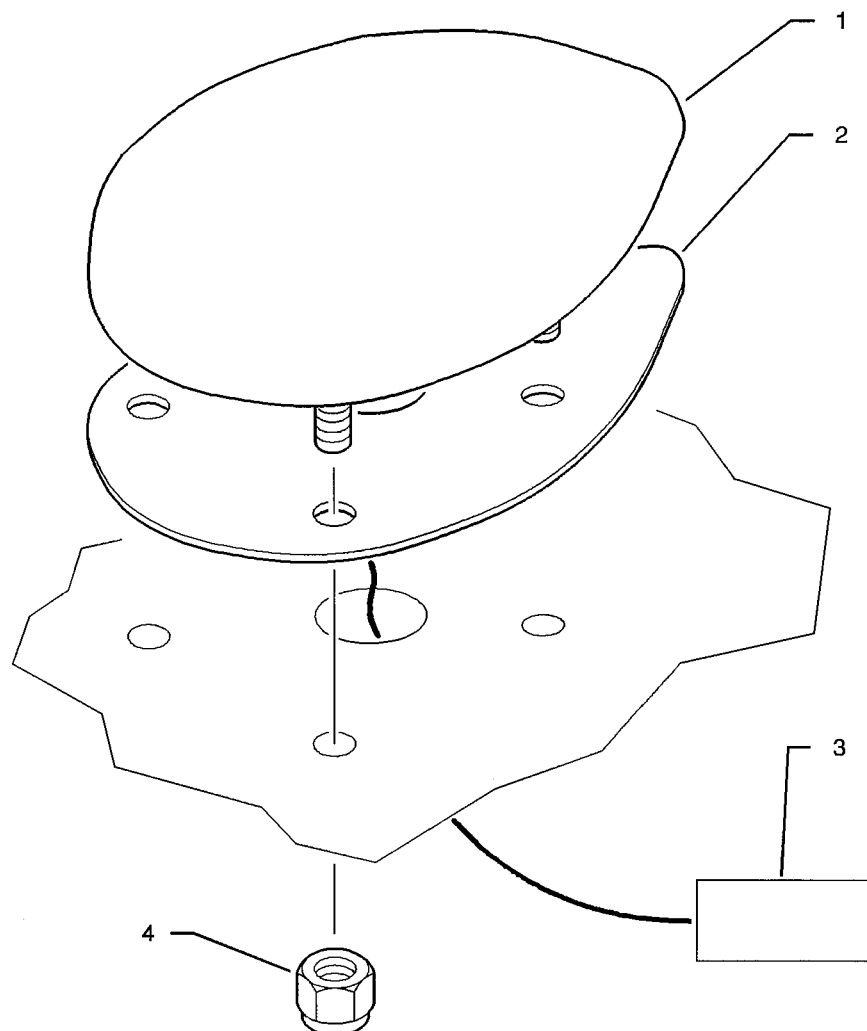
- 6) Position and secure 241F overhead panel.

All

- 7) Apply a bead of sealant (TB 09-903) around the antenna / fuselage junction.
- 8) Perform an operational test of the GPS system.



- 1 - GPS antenna
- 2 - Gasket
- 3 - Connector
- 4 - Nut



14345702AAA BVZ14100

GPS antenna - Removal / Installation
Figure 201

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E023 / E92 / E93 RELAY BOX

MAINTENANCE PRACTICES

NOTE : This procedure is applicable to L.H. and R.H. installations. Information specific to R.H. installation are given in square brackets.

1. SERVICING

None

2. REMOVAL / INSTALLATION - RELAY BOX (Figure 201)

A. Tools and consumable materials

- Stainless steel bonding brush
- Alodine (TB 13-002)
- Petrolatum (TB 04-012)
- Abrasive cloth (TB 05-916C)
- Varnish (TB 07-906)
- Cleaning agent (TB 11-912)
- Clean lintfree cloths

B. Removal of the relay box

- 1) Make sure that the main switch-breaker is open.
- 2) Remove inspection door 211L [211R].
- 3) Disconnect connector (3) from relay box (1).
- 4) Remove bolts (8) and washers (7).
- 5) Remove relay box (1).

C. Installation of the relay box

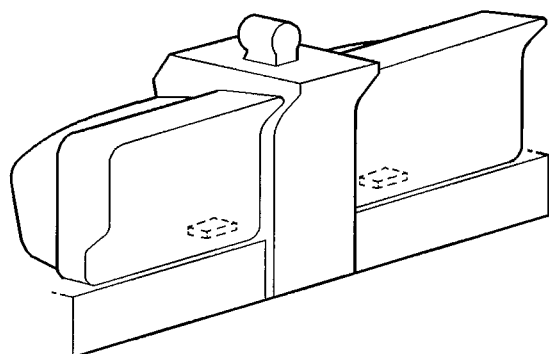
- 1) Make sure that the main switch-breaker is open.
- 2) On front table (2), if the areas to be bonded (6) are alodine-coated, clean the areas with a cloth moistened with cleaning agent (TB 11-912) and wipe with a dry cloth. Moderately coat the alodine-coated surface with petrolatum (TB 04-012).
- 3) If the areas to be bonded (6) are not alodine-coated, perform the bonding of the areas - refer to 20-00-12.
- 4) On relay box (1), clean and, if necessary, recondition the areas (5) facing those bonded on the front table.
- 5) If grounding lug (4) has to be reconnected, clean and, if necessary, recondition the contact area on the relay box.
- 6) Position and secure the relay box with bolts (8) and washers (7).

NOTE : If installed, secure lug (4) with bolt (8) and washer (7).

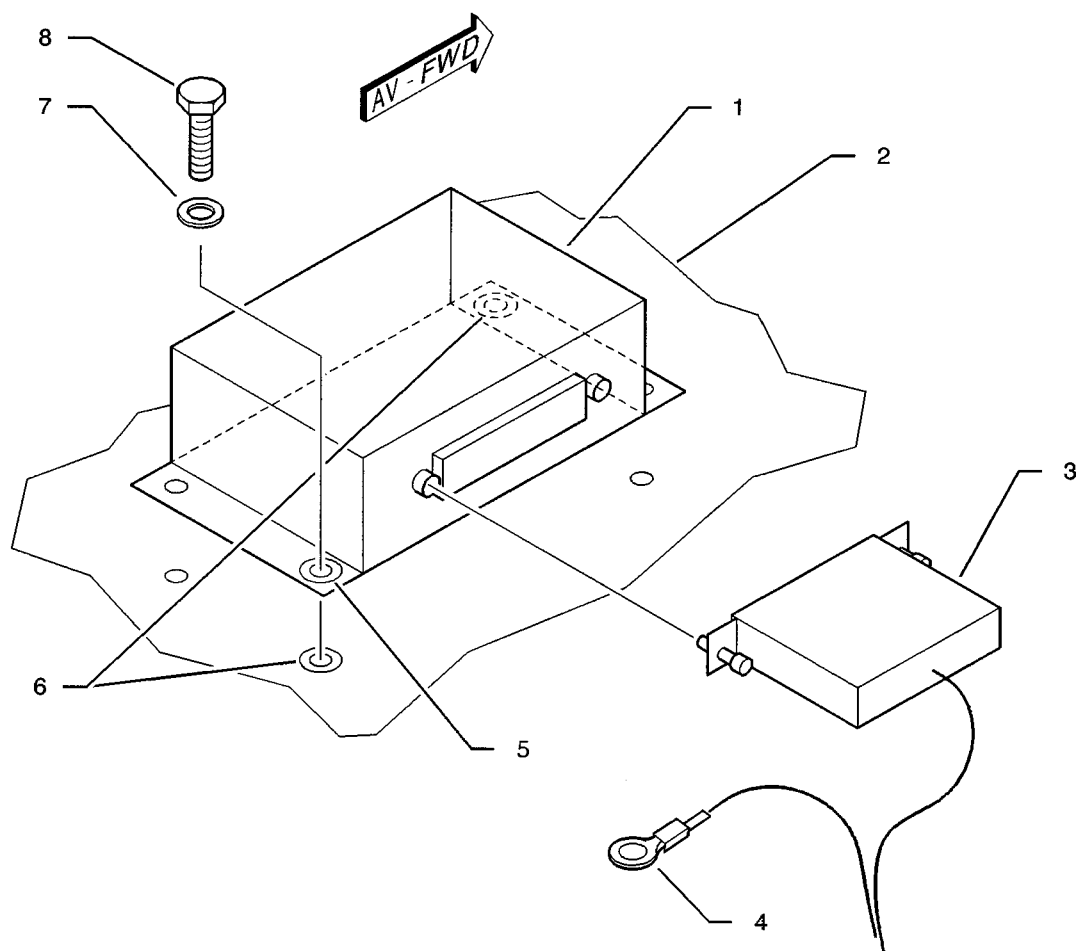
AAAA

Validity : GPS with HSI

- 7) Carefully clean excess petrolatum (TB 04-012) with a clean cloth slightly moistened with cleaning agent (TB 11-912).
- 8) Coat the relay box attachment hardware with varnish (TB 07-906) beyond the alodine-coated area.
- 9) Connect connector (3).
- 10) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 11) Close inspection door 211L [211R].
- 12) Perform an operational test of the GPS system.



- 1 - Relay box
- 2 - Front table
- 3 - Connector
- 4 - Lug
- 5 - Areas to be bonded
- 6 - Areas to be bonded
- 7 - Washer
- 8 - Bolt



E023 / E92 / E93 relay box - Removal / Installation
Figure 201

14345000AAAEWZ4100

AAAA
Validity : GPS with HSI

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FLIGHT MANAGEMENT COMPUTING

DESCRIPTION AND OPERATION

1. GENERAL

This section describes the systems which combine navigation data to compute or manage the aircraft geographical position or to determine its theoretical flight path.

The installation includes the multifunction display option.

2. DESCRIPTION

A. Multifunction display – refer to 34-62-00

The multifunction display enables navigation charts and information provided by other systems to be displayed.

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MULTIFUNCTION DISPLAY

DESCRIPTION AND OPERATION

1. GENERAL

The multifunction display provides a visual reference of the aircraft position depending on ground facilities and gives a navigation aid.

The system consists of :

- the M63 multifunction display,
- the data base card.

The multifunction display receives information from :

- the Global Positioning System (GPS) - refer to 34-57-00,
- the Stormscope system (option) - refer to 34-41-00.

The multifunction display is electrically supplied by "BUS 3" bar.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
M63 multifunction display	1	251C	/	34-50-00
Circuit breaker : - CB 99 "MFD"	1	PL1	/	WM

3. DESCRIPTION

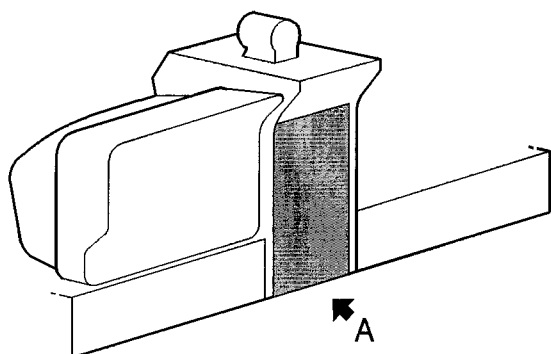
A. M63 multifunction display (Figure 2)

The multifunction display allows to display topographical data (rivers, roads, ...), aeronautical data (VOR, Airport, NDB, ...) and the active flight management provided by a GPS. Topographical and aeronautical data are stored in a data base card. It also allows storm data to be displayed when it is interfaced with a Stormscope system.

The front face of the multifunction display features :

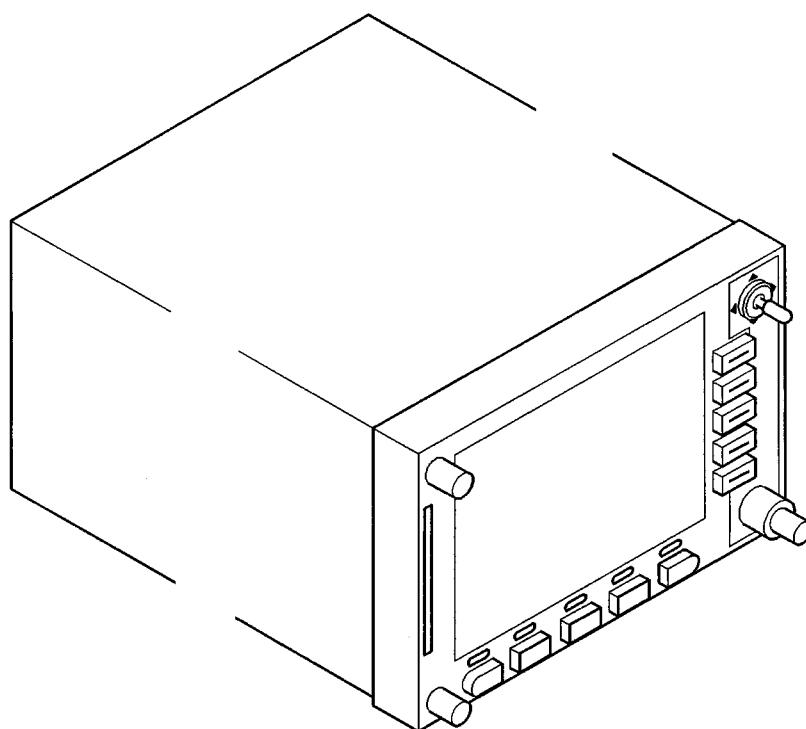
- a color graphic display (1),
- a button (2) to adjust brightness of the color graphic display,
- a cartridge (3) containing the removable data base card,
- an "OFF-ON" button (4) to energize the multifunction display,
- five pushbuttons (5) to select the different available data sources to be displayed. An indicator light located above each pushbutton allows the selection to be confirmed,
- two concentric buttons (6) with various functions. If necessary, a message appears on the graphic display to indicate the button function,

A - M63 multifunction display



 Variante de localisation
Alternate location

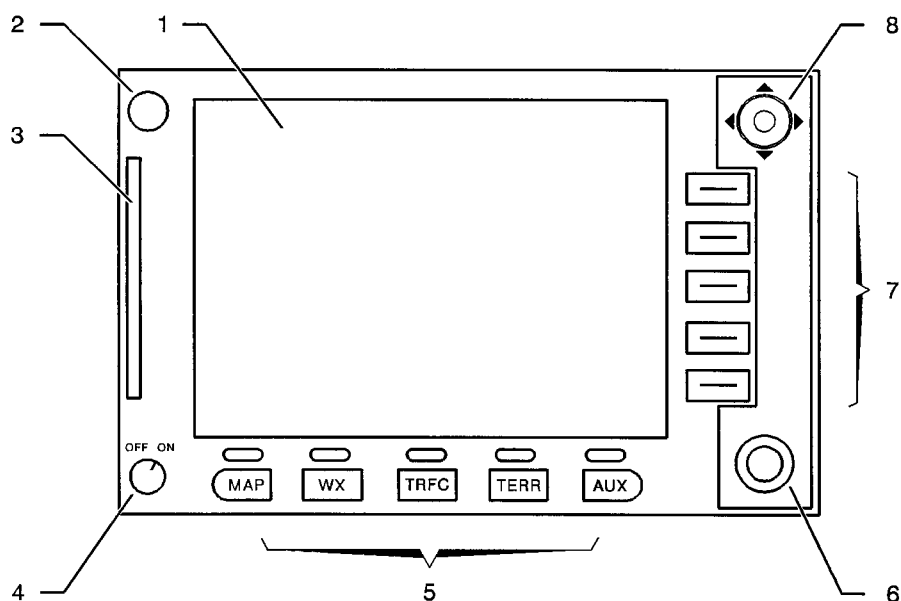
(A)



Multifunction display – Identification and location of components
Figure 1

14346200AAAAATY4200

- 1 - Color graphic display
- 2 - Button
- 3 - Cartridge
- 4 - "OFF-ON" button
- 5 - Pushbuttons (to select data sources)
- 6 - Concentric buttons
- 7 - Pushbuttons
- 8 - Joystick



Multifunction display – M63 multifunction display
Figure 2

I4346200AAAA TY14000

- five pushbuttons (7) to act on the pages displayed. Their functions are described in a message which appears on the graphic display in front of each pushbutton or in an illuminated message which appears to the right of each pushbutton,
- a joystick (8).

The multifunction display is electrically supplied by the "BUS 3" bar via a master radio relay and protected by the "CB 99" circuit breaker.

M63 multifunction display is installed in the radio rack.

4. OPERATION

The "RADIO MASTER" switch energizes the radionavigation system. Make sure the data base card is installed and serviceable as the system cannot operate if the board is not installed. Energize the multifunction display via the "OFF-ON" button and adjust the display brightness.

Momentarily press the pushbutton identified on the display by "OK" message to validate the test page and the page of the data base card. Then, the equipment is operated via the joystick and the pushbuttons.

A. MAP mode

The function enables to display the topography of the area flown over superimposed on aeronautical data and/or a flight management provided by the GPS, on the graphic display.

The joystick allows to point particular points on the map for additional information and measure the distance and bearing of specific points.

The multifunction display receives data from the GPS via a RS 232 link.

B. WX mode

The function allows data on electric phenomena caused by storms to be displayed on the graphic display. The data are provided by the optional Stormscope system.

The joystick enables to cancel the data already displayed and to generate new data on the display.

C. AUX mode

The function enables to gain access to setup pages.

The joystick enables to modify the parameters in setup pages.

D. TRFC and TERR modes

These modes are inoperative.

MULTIFUNCTION DISPLAY

ADJUSTMENT / TEST

1. OPERATIONAL TEST OF THE MULTIFUNCTION DISPLAY

A. Tools and consumable materials

- Ground power unit

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Connect the ground power unit – refer to 24-40-00.
- 3) Close main switch-breaker.
- 4) Set radio master switch to "ON".
- 5) Perform the following test :

ACTION

RESULT

- (1) Press "OFF-ON" pushbutton to energize the multifunction display.

- (a) The multifunction display performs an automatic test.
- (b) A test page appears on the multifunction display.

NOTE : The test page lists the optional modules installed on the equipment.

- (2) If necessary, momentarily press the pushbutton identified on the display by "OK" message to validate the test page.

- (a) A page relating to the validity of Jeppesen "Data Base" appears on the multifunction display.

- (3) Momentarily press the pushbutton identified on the display by "OK" message to validate the "Data Base" page.

- (a) A "TOPO ON MAP" page (display of topographical map) appears on the multifunction display.

- (4) Momentarily press "MAP" pushbutton.

- (a) A "TOPO OFF MAP" page (suppression of topographical map) appears on the multifunction display.

- (5) Press and release "MAP" pushbutton several times.

- (a) "TOPO ON MAP" page and then "TOPO OFF MAP" page appear on the multifunction display.

- (6) De-energize the multifunction display.

- 6) Set radio master switch to "OFF".
- 7) Open main switch-breaker.
- 8) Disconnect the ground power unit – refer to 24-40-00.

ABAB

Validity : KMD 550

34-62-00 (BE)

Page 501
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2. CONFIGURATION OF MULTIFUNCTION DISPLAY/STORMSCOPE

NOTE : This procedure is carried out only when the multifunction display is replaced and when it must be interfaced with a stormscope system. First, do the configuration of the multifunction display.

A. Tools and consumable materials

- Ground power unit

B. Procedure

- 1) Make sure that the main switch-breaker is open.
- 2) Connect the ground power unit - refer to 24-40-00.
- 3) Close main switch-breaker.
- 4) Set radio master switch to "ON".
- 5) Perform the following test :

ACTION	RESULT
(1) Press "OFF-ON" pushbutton to energize the multifunction display.	(a) The multifunction display performs an automatic test. (b) A test page appears on the multifunction display. NOTE : The test page lists the optional modules installed on the equipment.
(2) If necessary, momentarily press the pushbutton identified on the display by "OK" message to validate the test page.	(a) A page relating to the validity of Jeppesen "Data Base" appears on the multifunction display.
(3) Momentarily press the pushbutton identified on the display by "OK" message to validate the "Data Base" page.	(a) A "TOPO ON MAP" page (display of topographical map) appears on the multifunction display.
(4) Momentarily press "AUX" pushbutton.	(a) "AUXILIARY MODE COVER PAGE" page appears on the multifunction display.
(5) Momentarily press the pushbutton identified on the display by "SYSTEM CONFIG" message.	(a) "Password" page appears on the multifunction display. □
(6) Enter "3333" code with the pushbutton identified on the display by "3" message.	(a) "SYSTEM CONFIGURATION PAGE" page appears on the multifunction display.
(7) Momentarily press the pushbutton identified on the display by "DATA I/O" message.	(a) "DATA I/O PAGE" page appears on the multifunction display.

ACTION

RESULT

(8) With the joystick, confirm that the multifunction display is interfaced with the stormscope system.

(a) "ENABLED" message appears in front of "STORMSCOPE" field.

(9) Momentarily press "MAP" pushbutton.

6) De-energize the multifunction display.

7) Set radio master switch to "OFF".

8) Open main switch-breaker.

9) Disconnect the ground power unit - refer to 24-40-00.

3. CONFIGURATION OF MULTIFUNCTION DISPLAY

A. Tools and consumable materials

- Ground power unit

B. Procedure

To configure the multifunction display, refer to HONEYWELL Installation Manual "KMD 550/850 Multi-function display system", Reference 006-10608-0003, at the latest revision.

The following tables define the parameters programmed in the equipment at the aircraft delivery depending on the installed option.

SYSTEM CONFIGURATION PAGE		
SLOT	BOARD FUNCTION	
1	MAP PROCESSOR	X
2	EMPTY	
3	EMPTY	
4	EMPTY	
5	EMPTY	
6	PWR SUPPLY	X
7	IFACE PROCESSOR	X
-	FRONT PANEL	X

DATA I/O PAGE		
EXTERNAL GPS		ENABLE
STORMSCOPE		ENABLE*

LIGHTING PAGE	
DISPLAY LIGHTING CURVE	SEE TABLE 502
INDICATOR LIGHTING CURVE	
BACK LIGHTING CURVE SELECT L. BUS Voltage : 28VDC	

NOTE : 1 - * If installed

NOTE : 2 - In "MAP SETUP" SELECT : "TRACK UP".

Configuration pages – OPT10-34-304-A
Table 501

N° point	Display Lighting curve	Indicator lighting curve	Backlighting curve
1	28.2	0	0
2	30.9	0	4.3
3	31.3	9.8	4.3
4	31.7	16.0	4.3
5	34.9	21.5	4.3
6	37.2	25.8	4.3
7	40.3	32.1	4.3
8	43.1	38.8	4.3
9	46.2	39.6	4.3
10	49.8	52.1	17.2
11	52.9	58.8	30.1
12	56.0	65.4	43.5
13	59.2	65.4	55.6
14	63.5	65.4	79.2
15	67.4	65.4	85.4
16	76.0	65.4	93.3
17	100	65.4	100

Configuration pages – OPT10-34-304-A
Table 502

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