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 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.10		
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10.1 DESCRIPTION

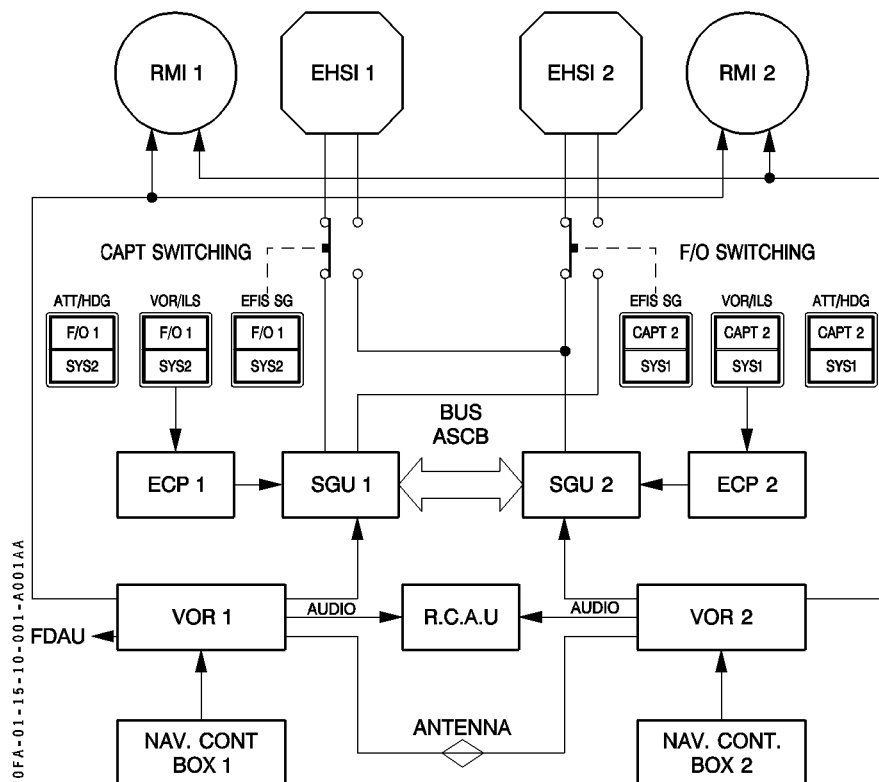
The aircraft is equipped with :

- Two VOR receivers,
- Two ILS receivers,
- One MKR receiver,
- One DME interrogator/receiver,
- One additional DME interrogator/receiver optional.

Note : VOR 1, ILS 1 and MKR are integrated in a common box, as are VOR 2 and ILS 2.

VOR

The two VOR receivers are independent, but use a common VOR antenna located on top of the vertical stabilizer. Each receiver is individually controlled by the associated NAV control box on the glareshield panel : VOR 1 on the LH side, VOR 2 on the RH side. The receivers are designed for reception of one of the 160 channels with 0,05 MHz spacing in the 108.00 to 117.95 MHz frequency range. The VOR audio signals are transmitted to the Remote Control Audio Unit.



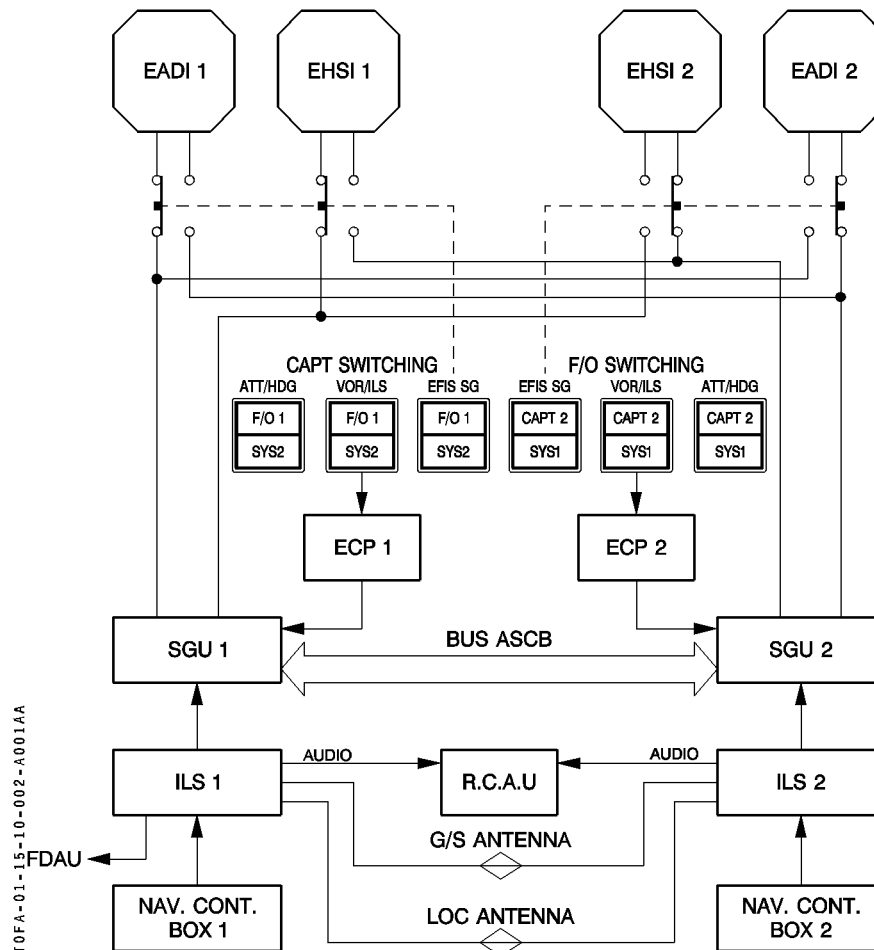
	NAVIGATION SYSTEM		1.15.10		
			P 2	001	
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ILS

The two ILS receivers are independent but use a common LOC antenna used for the VOR systems and a common G/S antenna. Each receiver is individually controlled by the associated NAV control box on the glareshield panel : ILS 1 on the LH side, ILS 2 on the RH side.

The receivers operate for localizer reception in the 108 MHZ to 112 MHZ VHF range and for glideslope reception in the 329 to 335 MHZ VHF range. Each of the 40 localizer channels is combined with a matched glideslope channel. The ILS audio signals are transmitted to the Remote Control Audio Unit.



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MARKER

The MARKER beacon receivers are connected to the marker antenna and are controlled by the NAV 1 and the NAV 2 control boxes. Outer, middle and inner or airways markers signals are received and processed for visual display and audio annunciation.

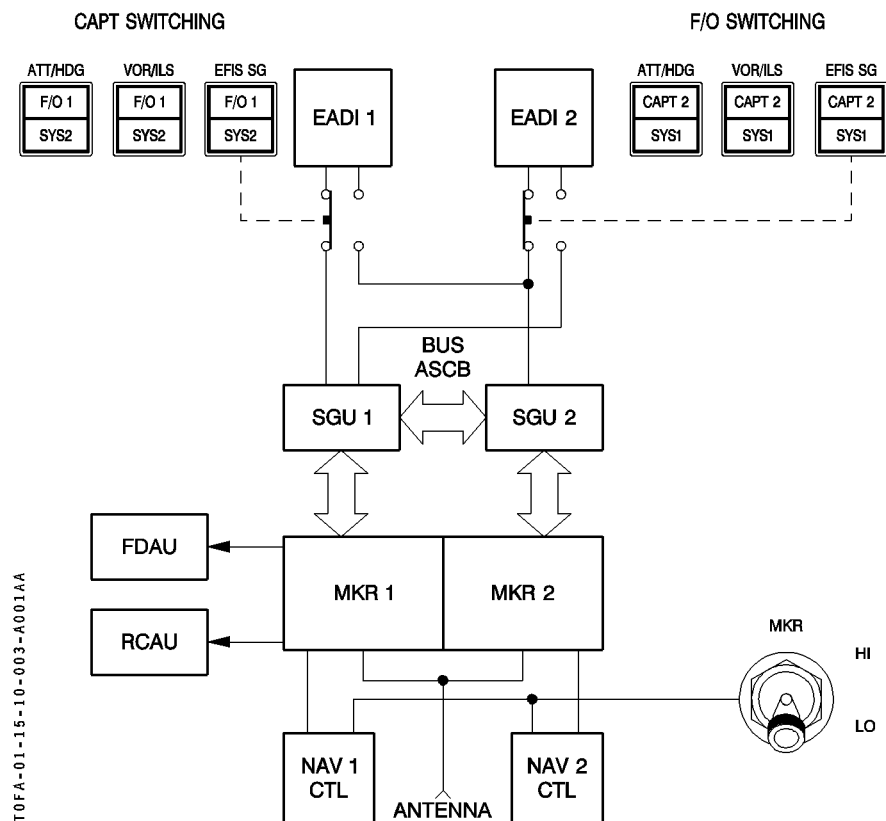
Information coming from VOR/ILS/MKR is digital.

The visual signal is displayed at the bottom right corner of the EADI.

Only MKR 1 audio signals are transmitted.

The marker audio signals are transmitted to the Remote Control Audio Unit.

On the captain's side panel, a switch allows selection of marker sensitivity (LO or HI).



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 ATR F.C.O.M.	NAVIGATION SYSTEM VOR/ILS/MKR/DME SYSTEM	1.15.10		
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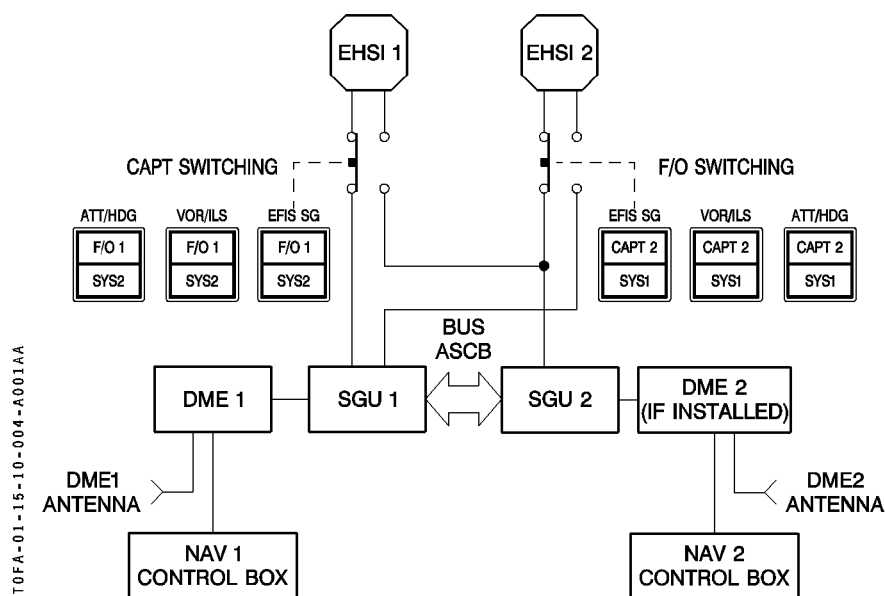
DME

The DME system operates in the 1025 to 1150 MHz frequency range with 1 MHz spacing. DME 1 channeling is accomplished through the NAV 1 control box and DME 2 (if installed) channeling through the NAV 2 control box. The frequency selection is automatically associated with the relative NAV frequency, as selected on the glareshield panel. The DME measures the slant range to the station when the selected NAV station is equipped with a DME.

DME audio signals are transmitted to the Remote Control Audio Unit.

R DME values are sent to the SGUs and displayed on the EHSI.

R When the DME is in "HOLD" mode, an amber "H" appears on top right corner of the affected EHSI. In this case, the affected DME will remain locked to the one previous frequency selected, allowing the NAV control box to be used for any other desired frequency.



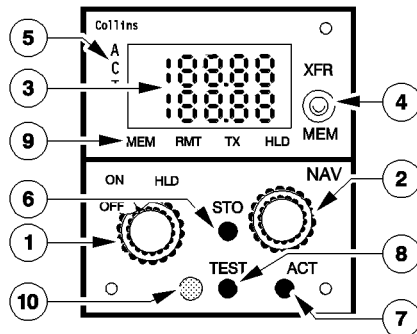
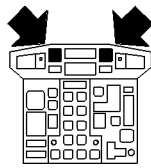
 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.10		
			P 5	001	
	VOR/ILS/MKR/DME SYSTEM				DEC 95

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10.2 CONTROLS

NAV CONTROL BOX

TOFA-01-15-10-005-A001AA



① Power, Mode and volume switches

- Outer knob enables to switch the system ON. The HLD position allows the NAV frequency to be changed, while holding the DME on the current active frequency.
- Inner knob enables to adjust the volume of reception.

② Frequency select knobs

Control the preset or active frequency display.

- Outer knob changes the three digits to the left of the decimal point.
- Inner knob changes the two digits to the right of the decimal point.

③ Frequencies display

- The active frequency is displayed in the upper window.
- The preset frequency is displayed in the lower window.

④ XFR/MEM switch

is spring loaded in neutral position.

XFR Exchanges active and preset frequency.

MEM One of the frequencies stored in the memory is loaded into the preset display. Successive actions cycle the four memory frequencies through the display.

⑤ Compare annunciator (ACT)

ACT flashes if the actual radio frequency is not identical to the frequency shown in the active frequency display.

	NAVIGATION SYSTEM	1.15.10		
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	VOR/ILS/MKR/DME SYSTEM			DEC 95

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⑥ STO button

Allows to enter the frequencies into the four memory positions.

- Preset the frequency to be stored.
- Push the STO button : upper window displays an available memory channel
- For 5 seconds, the MEM switch may be used to change the channel number.
- Push the STO button a second time : displayed frequency is stored in the displayed channel.
- After 5 seconds, the control returns to normal operation.

⑦ ACT button

In normal operation, frequency select knobs (2) changes the preset frequency display. After a 2 second push on the ACT button, bottom window displays dashes, the knobs directly act on the active frequency. A second push on the ACT button enables a return to normal operation.

⑧ TEST button

Is used to initiate the radio self-test diagnostic routine.

⑨ Annunciators

MEM (Memory) illuminates when a preset frequency is being displayed in the lower window.

RMT (Remote) illuminates when the NAV control box is being remotely controlled by an other system (FMS, NCS, etc...).

HLD (Hold) illuminates when the DME is held to the active frequency at time of selection. The upper window displays the NAV frequency and the lower window displays the held DME frequency.

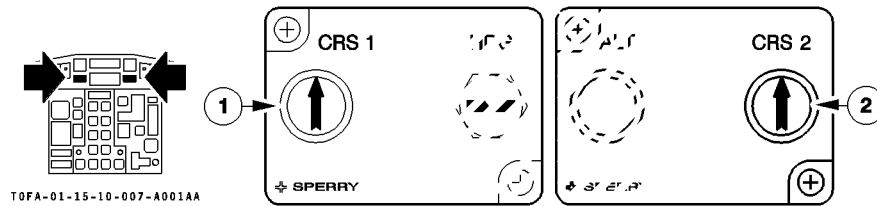
⑩ Light sensor

Automatically adjusts the display brightness.

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.10		
			P 7	001	
	VOR/ILS/MKR/DME SYSTEM				DEC 95

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CRS 1/HDG AND ALT/CRS 2 PANELS



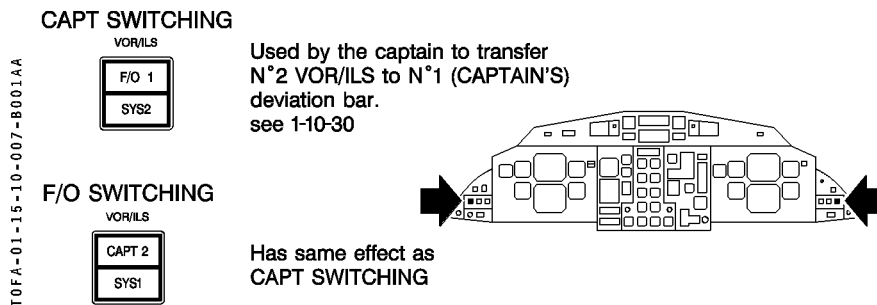
① CRS 1 knob

Selects course on CAPT EHSI.

② CRS 2 knob

Selects course on F/O EHSI.

CAPT SOURCE AND F/O SWITCHING

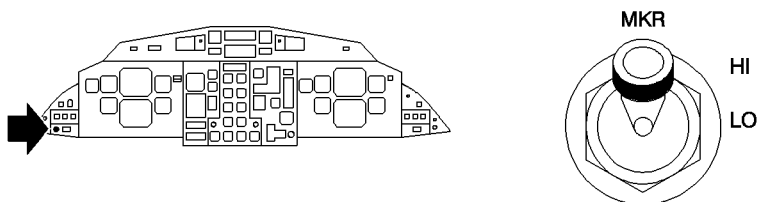


	NAVIGATION SYSTEM		1.15.10	
			P 8	001
	VOR/ILS/MKR/DME SYSTEM			DEC 95

AA

MKR SW

TOFA-01-15-10-008-A001AA



Is used to set marker sensitivity

10.3 ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)
NAV 1	DC STBY BUS (on overhead panel VOR 1)
NAV 2	DC BUS 2 (on overhead panel VOR 2)
DME 1	DC BUS 1 (on overhead panel DME 1)
DME 2 (if installed)	DC BUS 2 (on overhead panel DME 2)

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.20		
			P 1	001	
	ADF SYSTEM				DEC 95

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20.1 DESCRIPTION

The aircraft is equipped with an ADF system. It provides relative bearing indication to NDB'S or broadcast stations.

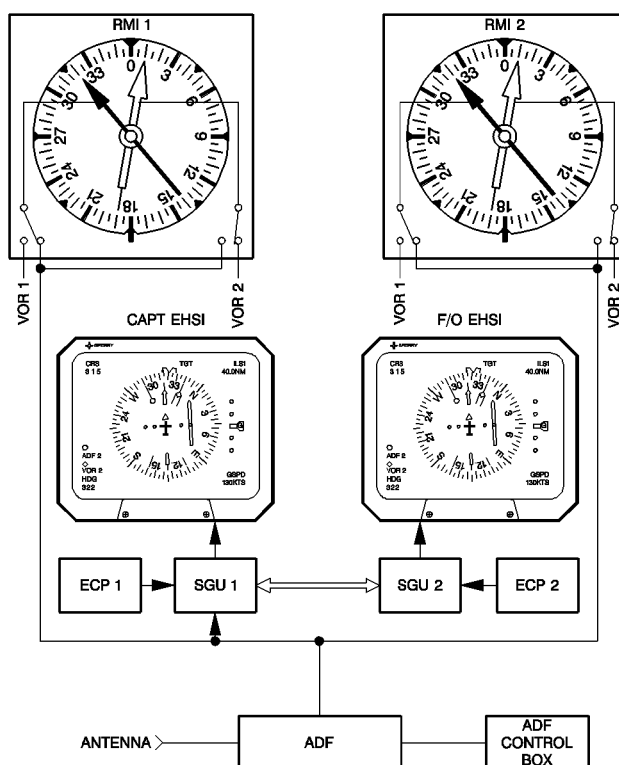
Bearing can be displayed on EHSI and/or on RMI.

The receiver frequency range is from 190 to 1799 KHz.

The ADF antenna is located on top of the fuselage.

The ADF audio signals are transmitted to the Remote Control Audio Unit.

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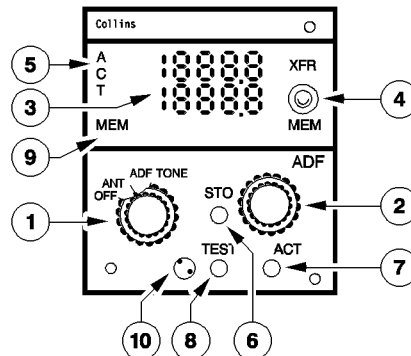
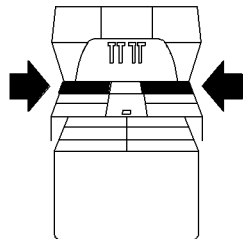
	NAVIGATION SYSTEM		1.15.20		
			P 2	001	
	ADF SYSTEM				DEC 95

AA

20.2 CONTROLS

ADF CONTROL BOX

T0FA-01-15-20-002-A001AA



① Power, mode and volume controls

- Outer knob enables to switch the system ON, and to choose ANT, ADF or TONE system mode of operation.
- Inner knob enables to adjust the volume of reception.

② Frequency select knobs

- The larger knob changes the 1000's and 100's KHz digits.
- The smaller knob changes the 10's, units and tenth KHz digits. Normal rotation changes the display in 1 KHz steps, except for the two steps backward following a rotation, which will change the display in a 0.5 KHz step.

③ Frequencies display

- Upper window displays the active frequency.
- Lower window displays the standby frequency.

④ XFR/MEM switch

This switch is a 3 position, spring loaded toggle switch.

XFR : Active frequency and standby frequency are exchanged.

MEM : One of the four stored memory frequencies is loaded into the standby display. When the switch is pushed several times, the four memory frequencies are cycled.

⑤ Compare annunciator (ACT)

ACT flashes if the actual radio frequency is not identical to the frequency shown in the active frequency display.

	NAVIGATION SYSTEM		1.15.20	
	ADF SYSTEM		P 3	001
				NOV 99

AA

⑥ STO button

Allows to enter frequencies into the four memory positions.

- Preset the frequency to be stored.
- Push the STO button : upper window displays an available memory channel.
- For 5 seconds, the MEM switch may be used to change the channel number.
- Push the STO button a second time : displayed frequency is stored in the displayed channel.
- After 5 seconds, the control returns to normal operation.

⑦ ACT button

In normal operation, frequency select knobs(2) change the preset frequency display. After a 2 second push on the ACT button the bottom, window displays dashes, the knobs directly act on the active frequency. A second push on the button enables return to normal operation.

⑧ TEST button

Is used to initiate the radio self test diagnostic routine.

⑨ Annonciators

MEM (Memory) : illuminates when a preset frequency is being displayed in the lower window.

RMT (Remote) : illuminates when the ADF control box is being remotely controlled by an other system (FMS, NCS, etc...).

⑩ Light sensor

Automatically adjusts the display brightness.

20.3 ELECTRICAL SUPPLY

R	EQUIPMENT	DC BUS SUPPLY (C/B)
	ADF 1	DC STBY BUS (on overhead panel ADF 1)
	ADF 2 (if installed)	DC BUS 2 (on overhead panel ADF 2)

	NAVIGATION SYSTEM	1.15.30		
		P 1	001	
	RADIO ALTIMETER			DEC 95

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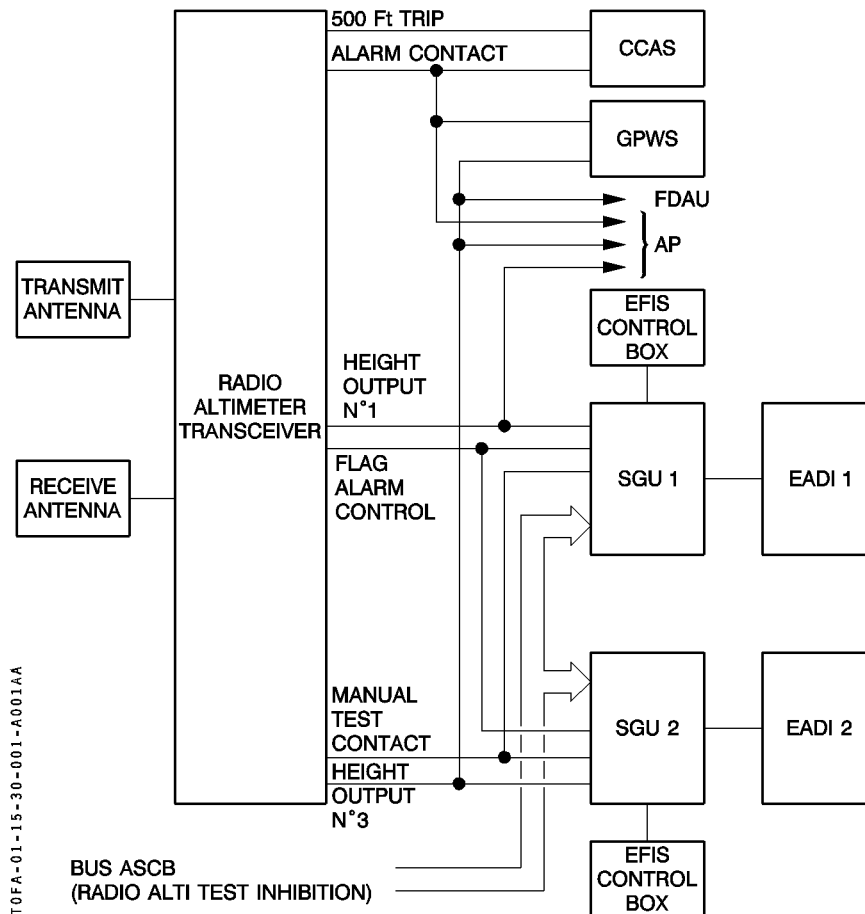
30.1 DESCRIPTION

The radio altimeter gives accurate height information when flying below 2500 ft and is particularly useful during the approach phase.

The radio altimeter system comprises one transceiver and two antennae.

The range of the display is from -20 to + 2500 ft. Radio altitude information is displayed on the bottom right of the EADI.

When radio altitude information is not valid, amber dashes are displayed and systems using this information may provide undue alarms.



	NAVIGATION SYSTEM	1.15.30		
		P 2	001	
	RADIO ALTIMETER			DEC 95

AA

30.2 ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)
Radio altimeter	DC BUS 1 (on overhead panel RAD ALT)

 ATR F.C.O.M.	NAVIGATION SYSTEM GPWS	1.15.40		
		P 1	001	
				DEC 95

AA

40.1 DESCRIPTION (See schematic p 9/10)

The Ground Proximity Warning System (GPWS) provides visual and aural alerts in case of dangerous flight path conditions which would result in inadvertent ground contact if maintained. The system generates alerts only between 50 ft and 2500 ft AGL.

Six alert modes are established with defined danger envelopes :

- Mode 1 excessive sink rate.
- Mode 2 excessive terrain closure rate.
- Mode 3 descent after take off.
- Mode 4 inadvertent proximity to terrain with landing gear or flaps not in landing configuration.
- Mode 5 descent below ILS glideslope.
- Mode 6 descent below minimums.

The GPWS includes :

- A GPWS computer.
- Two GPWS/GS lights.
- A GPWS FAULT amber light on CAP.
- A GPWS selector
- Several aural alert channels.

For operation, the system requires data supply from ADC 1, ILS 2, radio altimeter, flaps position transmitter and gear lever position transmitter.

Mode 5 is active whenever a valid ILS glideslope signal is supplied. If the ILS converter signals no computed data, mode 5 alert is inhibited. The mode 5 alert is also inhibited in back course operation.

Visual alert is provided :

- In mode 1, 2, 3, or 4 by illumination of the GPWS red lights, one on each pilots panel.
- In mode 5 by illumination of the GS amber lights, one on each pilots panel.

The aural alerts are voice alerts which segregate the various alert modes.

Mode 5 alerts may be inhibited by pressing one of the GPWS/GS pb below 1000 ft. The GPWS selector on the captain side panel is provided to avoid nuisance alerts in mode 4 caused by flap position when a landing has to be performed with reduced flap setting. In case of GPWS malfunction, all alerts can be inhibited by selection to OFF. The system can be tested on ground and in flight above 1000 ft radio height by pressing one of the GPWS/GS lt.

	NAVIGATION SYSTEM		1.15.40		
			P 2	001	
	GPWS				DEC 95

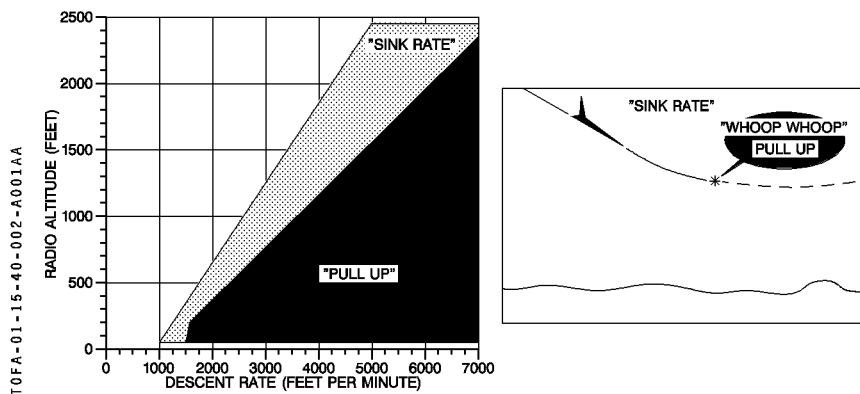
AA

ALERT MODES

MODE 1 : EXCESSIVE SINK RATE

When the aircraft penetrates the outer envelope, the "SINK RATE" voice alert is given and the red GPWS warning light illuminates.

If the inner envelope is penetrated, the "WHOO WHOO PULL UP" alert is given. This mode does not depend on the aircraft configuration.

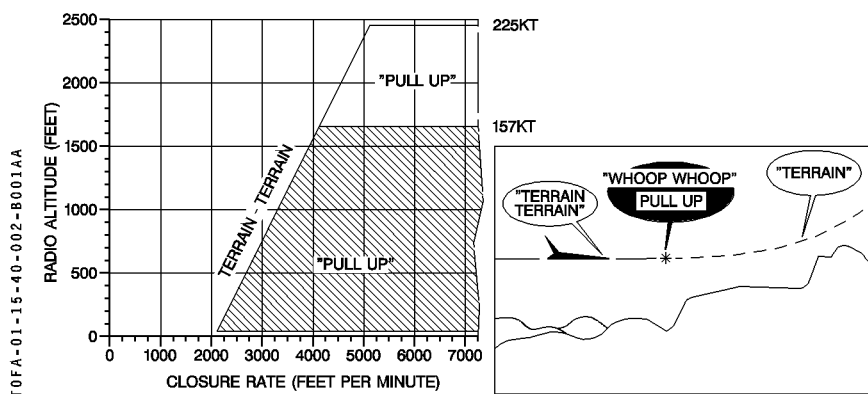


MODE 2 : EXCESSIVE TERRAIN CLOSURE RATE

- FLAPS NOT IN LANDING CONFIGURATION.

When the aircraft penetrates the envelope, the "TERRAIN" voice alert is given twice and the red GPWS warning light illuminates.

As long as the aircraft remains in the envelope, the "WHOO WHOO PULL UP" warning is given. When the warning conditions no longer exist, the "TERRAIN-TERRAIN" aural message is heard until the aircraft pressure altitude has increased by 300 ft of altitude.



	NAVIGATION SYSTEM GPWS	1.15.40		
		P 1	100	
				NOV 01

AA

40.1 DESCRIPTION (See schematic p 9/10)

The Ground Proximity Warning System (GPWS) provides visual and aural alerts in case of dangerous flight path conditions which would result in inadvertent ground contact if maintained. The system generates alerts only between 50 ft and 2500 ft AGL.

Six alert modes are established with defined danger envelopes :

- Mode 1 excessive sink rate.
- Mode 2 excessive terrain closure rate.
- Mode 3 descent after take off.
- Mode 4 inadvertent proximity to terrain with landing gear or flaps not in landing configuration.
- Mode 5 descent below ILS glideslope.
- Mode 6 descent below minimums.

The GPWS includes :

- A GPWS computer.
- Two GPWS/GS lights.
- A GPWS FAULT amber light on CAP.
- A GPWS selector
- Several aural alert channels.
- STEEP APP pb (Sink rate alert inhibition)

For operation, the system requires data supply from ADC 1, ILS 2, radio altimeter, flaps position transmitter and gear lever position transmitter.

Mode 5 is active whenever a valid ILS glideslope signal is supplied. If the ILS converter signals no computed data, mode 5 alert is inhibited. The mode 5 alert is also inhibited in back course operation.

Visual alert is provided :

- In mode 1, 2, 3, or 4 by illumination of the GPWS red lights, one on each pilots panel
- In mode 5 by illumination of the GS amber lights, one on each pilots panel.

The aural alerts are voice alerts which segregate the various alert modes.

Mode 5 alerts may be inhibited by pressing one of the GPWS/GS pb below 1000 ft.

The GPWS selector on the captain side panel is provided to avoid nuisance alerts in mode 4 caused by flap position when a landing has to be performed with reduced flap setting. In case of GPWS malfunction, all alerts can be inhibited by selection to OFF. The system can be tested on ground and in flight above 1000 ft radio height by pressing one of the GPWS/GS lt.

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.40		
			P 2	100	
	GPWS				NOV 01

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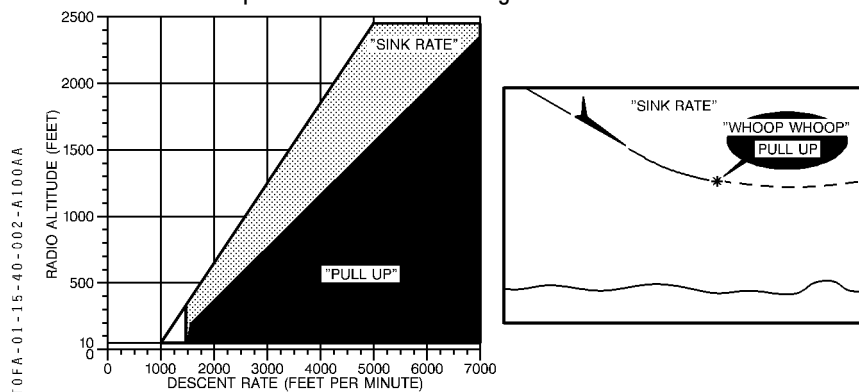
ALERT MODES

MODE 1 : EXCESSIVE SINK RATE

- When the aircraft penetrates the outer envelope, the "SINK RATE" voice alert is given and the red GPWS warning lights illuminate.

Note : For descent rate below 1450 ft/mn, the sink rate envelope is cut off when :

- STEEP APP pb is pressed in, and,
- GLIDE/ILS 2 deviation is below 2 points or not applicable, or,
- BACK COURSE mode is selected.
- If the inner envelope is penetrated, the "WHOO WHOO PULL UP" alert is given. This mode does not depend on the aircraft configuration.

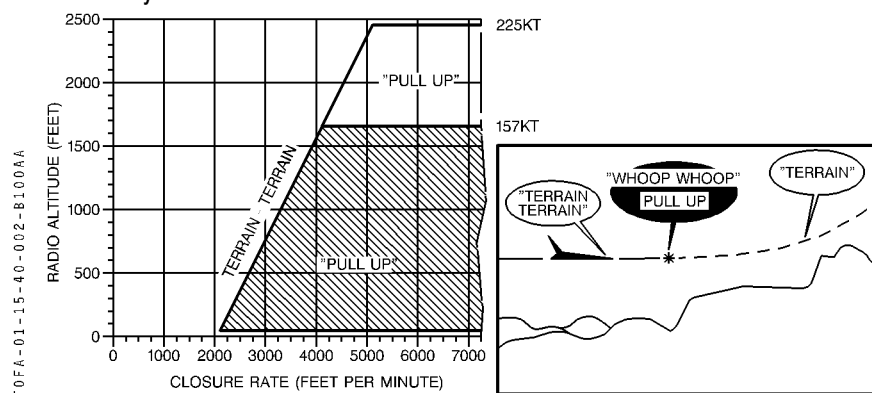


MODE 2 : EXCESSIVE TERRAIN CLOSURE RATE

● FLAPS NOT IN LANDING CONFIGURATION.

When the aircraft penetrates the envelope, the "TERRAIN" voice alert is given twice and the red GPWS warning lights illuminate.

As long as the aircraft remains in the envelope, the "WHOO WHOO PULL UP" warning is given. When the warning conditions no longer exist, the "TERRAIN-TERRAIN" aural message is heard until the aircraft pressure altitude has increased by 300 ft of altitude.

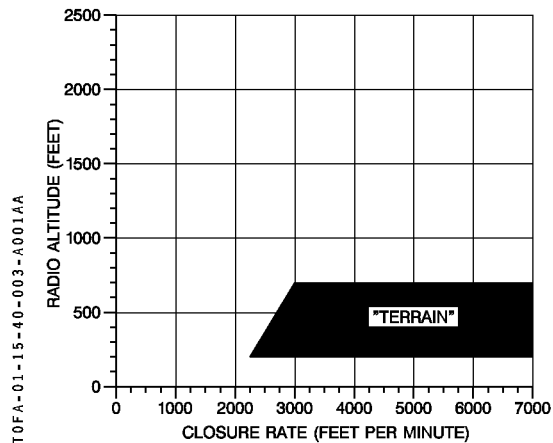


	NAVIGATION SYSTEM GPWS	1.15.40		
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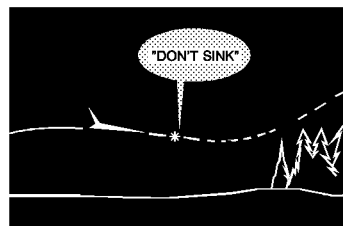
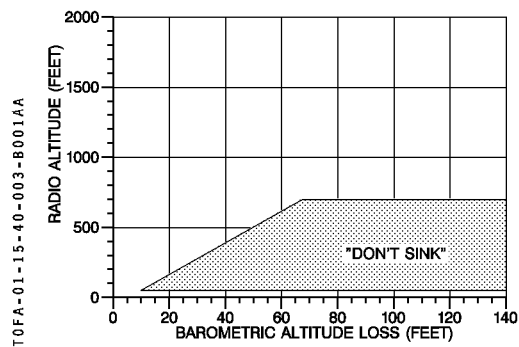
- FLAPS IN LANDING CONFIGURATION

When the aircraft penetrates the envelope, the "TERRAIN" voice alert is given twice and the red GPWS warning lights illuminate.



MODE 3 : DESCENT AFTER TAKE-OFF

This mode is active between 75 and 700 ft. When the aircraft penetrates the envelope, a "DON'T SINK" voice alert is given and the red GPWS warning lights illuminate.



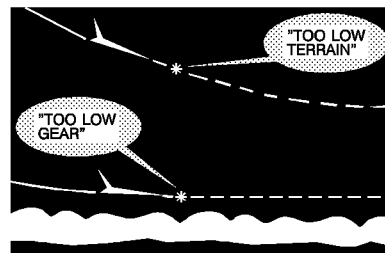
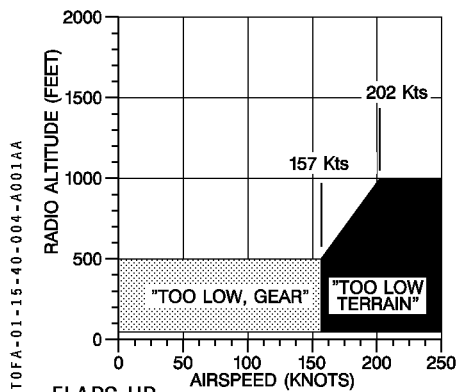
 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.40		
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MODE 4 : PROXIMITY TO TERRAIN

• GEAR UP

This mode is active as soon as the aircraft reaches 700 ft AGL after take-off. When the aircraft penetrates the envelope at a speed higher than 157 kt with gear not down and locked, a « TOO LOW TERRAIN » voice alert is given and the red GPWS warning lights illuminate. If penetration is made at a speed lower than 157 kt with gear not down and locked, a « TOO LOW GEAR » voice alert is given and the red GPWS warning lights illuminate.

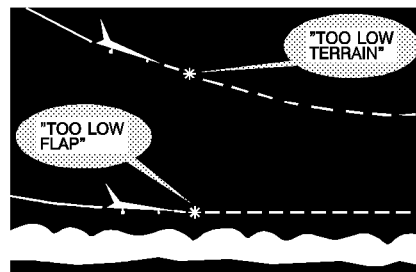
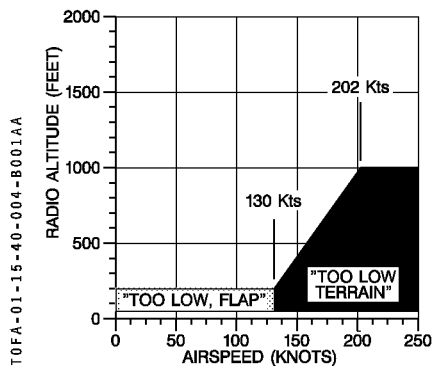


• FLAPS UP

This mode is active when the gear is down and locked but with the flaps not in landing configuration. When the aircraft penetrates the envelope at a speed higher than 130 kt, a "TOO LOW TERRAIN" voice alert is given and the red GPWS warning lights illuminate.

If penetration is made at a speed lower than 130 kt, a "TOO LOW FLAP" voice alert is given and the red GPWS warning lights illuminate.

The GPWS selector enables a landing with flaps not in the landing configuration without incurring a warning.



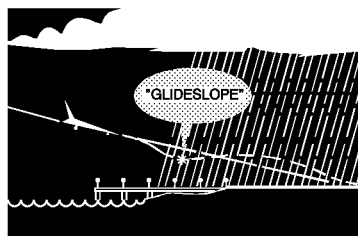
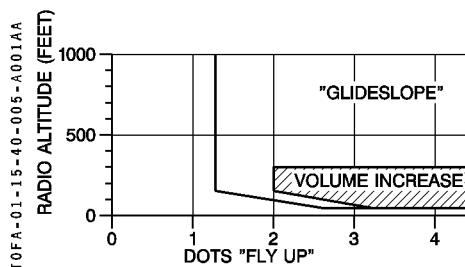
	NAVIGATION SYSTEM GPWS	1.15.40		
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MODE 5 : DESCENT BELOW GLIDESLOPE

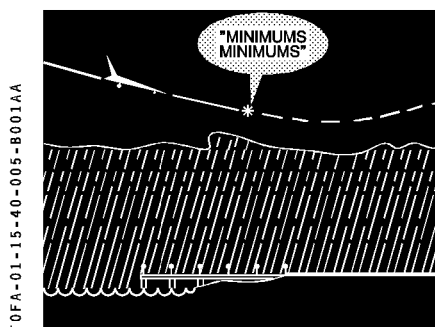
When the aircraft penetrates the outer envelope while on an ILS approach, a "GLIDE SLOPE" voice alert is given softly. If the inner envelope is penetrated, the same voice alert repeats faster and at a higher volume. In both cases, the amber GS caution lights illuminate.

These alerts can be inhibited below 1000 ft AGL in either the hard or soft alert region by depressing one of the GPWS/GS switches. The mode automatically rearms after a missed approach, landing or climb above 1000 ft AGL.



MODE 6 : DESCENT BELOW MINIMUMS

A "MINIMUMS MINIMUMS" voice alert is given when the aircraft passes with gear down through the selected decision height (between 50 and 1000 ft)



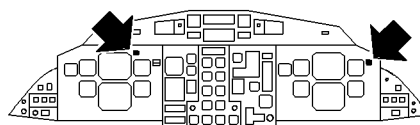
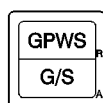
	NAVIGATION SYSTEM GPWS	1.15.40		
		P 6	001	
				DEC 95

AA

40.2 CONTROLS

GPWS – G/S PB

TOFA-01-15-40-006-A001AA



The pbs on CAPT and F/O panel are identical and connected in parallel. GPWS and G/S indications are integrated into the pbs.

GPWS Illuminates red as long as any mode 1-2-3-4 alert is activated. The illumination is accompanied by the voice alert for the particular mode.

G/S Illuminates amber as long as a mode 5 alert is activated. The illumination is accompanied by the voice alert for this particular mode.

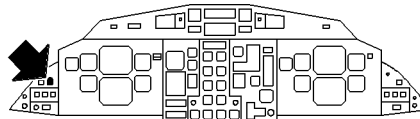
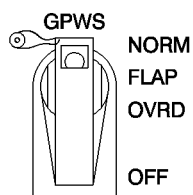
Pressed * On ground, or above 1000 ft with gear up, will perform the system test

- GPWS FAULT amber It illuminates on CAP.
- G/S amber lights illuminate on both pilots panels.
- Voice alert "GLIDE SLOPE" is given.
- One second time delay.
- GPWS red lights illuminate on both pilots panels.
- Voice alert "WHOOPE WHOOPE PULL UP" is given several times.
- GPWS red lights extinguish.
- G/S lights and GPWS FAULT light will extinguish as soon as the pb is released.

* below 1000 ft, will inhibit the mode 5 alerts (aural and visual).

GPWS SELECTOR

TOFA-01-15-40-006-B001AA



The selector is guarded in the NORM position

NORM All alerts are operative.

FLAP OVRD Mode 4 alert caused by flap extension, at less than landing configuration is inhibited to avoid nuisance warnings in case of landing with reduced flap setting.

OFF All mode alerts are inhibited.

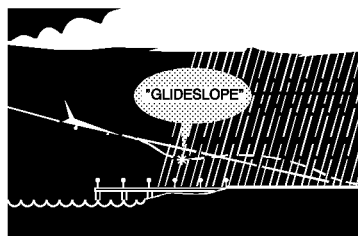
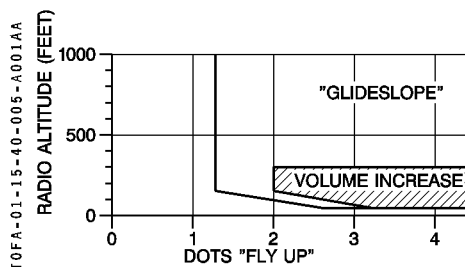
	NAVIGATION SYSTEM GPWS	1.15.40		
		P 5	001	
				DEC 95

AA

MODE 5 : DESCENT BELOW GLIDESLOPE

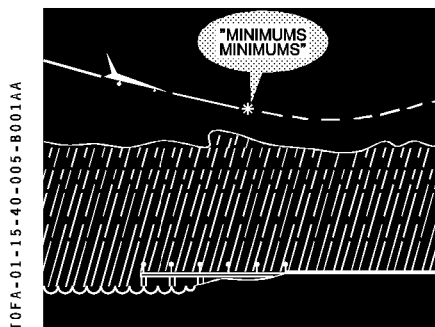
When the aircraft penetrates the outer envelope while on an ILS approach, a "GLIDE SLOPE" voice alert is given softly. If the inner envelope is penetrated, the same voice alert repeats faster and at a higher volume. In both cases, the amber GS caution lights illuminate.

These alerts can be inhibited below 1000 ft AGL in either the hard or soft alert region by depressing one of the GPWS/GS switches. The mode automatically rearms after a missed approach, landing or climb above 1000 ft AGL.



MODE 6 : DESCENT BELOW MINIMUMS

A "MINIMUMS MINIMUMS" voice alert is given when the aircraft passes with gear down through the selected decision height (between 50 and 1000 ft)

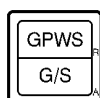


 ATR F.C.O.M.	NAVIGATION SYSTEM GPWS	1.15.40		
		P 6	100	
				NOV 00

AA

40.2 CONTROLS

GPWS - G/S PB



TOFA-01-15-40-006-A100AA



The pbs on CAPT and F/O panel are identical and connected in parallel. GPWS and G/S indications are integrated into the pbs.

GPWS Illuminates red as long as any mode 1-2-3-4 alert is activated.

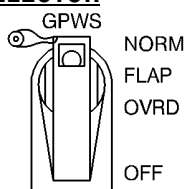
The illumination is accompanied by the voice alert for the particular mode.

G/S Illuminates amber as long as a mode 5 alert is activated. The illumination is accompanied by the voice alert for this particular mode.

Pressed * On ground, or above 1000 ft with gear up, will perform the system test

- GPWS FAULT amber It illuminates on CAP.
 - G/S amber lights illuminate on both pilots panels.
 - Voice alert "GLIDE SLOPE" is given.
 - One second time delay.
 - GPWS red lights illuminate on both pilots panels.
 - Voice alert "WHOOH WHOOH PULL UP" is given several times.
 - GPWS red lights extinguish.
 - G/S lights and GPWS FAULT light will extinguish as soon as the pb is released.
- * Below 1000 ft, will inhibit the mode 5 alerts (aural and visual).

GPWS SELECTOR



TOFA-01-15-40-006-B100AA



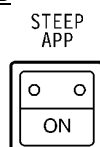
The selector is guarded in the NORM position

NORM All alerts are operative.

FLAP OVRD Mode 4 alert caused by flap extension, at less than landing configuration is inhibited to avoid nuisance warnings in case of landing with reduced flap setting.

OFF All mode alerts are inhibited.

STEEP APP PB



TOFA-01-15-40-006-C100AA



R Modifies the SINK RATE envelope, illuminates blue when pressed in.

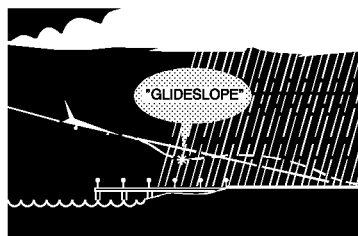
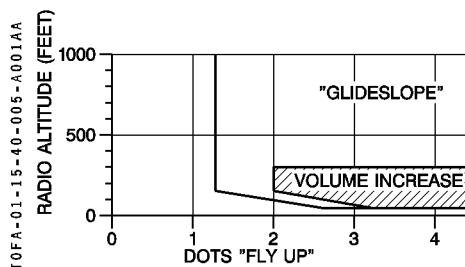
	NAVIGATION SYSTEM GPWS	1.15.40		
		P 5	001	
				DEC 95

AA

MODE 5 : DESCENT BELOW GLIDESLOPE

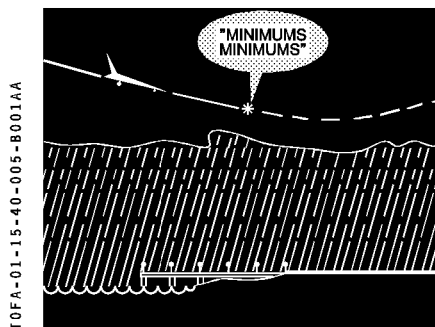
When the aircraft penetrates the outer envelope while on an ILS approach, a "GLIDE SLOPE" voice alert is given softly. If the inner envelope is penetrated, the same voice alert repeats faster and at a higher volume. In both cases, the amber GS caution lights illuminate.

These alerts can be inhibited below 1000 ft AGL in either the hard or soft alert region by depressing one of the GPWS/GS switches. The mode automatically rearms after a missed approach, landing or climb above 1000 ft AGL.



MODE 6 : DESCENT BELOW MINIMUMS

A "MINIMUMS MINIMUMS" voice alert is given when the aircraft passes with gear down through the selected decision height (between 50 and 1000 ft)

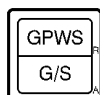


 ATR F.C.O.M.	NAVIGATION SYSTEM GPWS	1.15.40		
		P 6	120	
				NOV 01

AA

40.2 CONTROLS

GPWS - G/S PB



TOFA-01-15-40-006-A100AA

The pbs on CAPT and F/O panel are identical and connected in parallel. GPWS and G/S indications are integrated into the pbs.

GPWS Illuminates red as long as any mode 1-2-3-4 alert is activated.

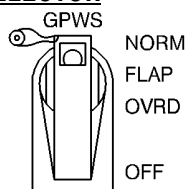
The illumination is accompanied by the voice alert for the particular mode.

G/S Illuminates amber as long as a mode 5 alert is activated. The illumination is accompanied by the voice alert for this particular mode.

Pressed * On ground, or above 1000 ft with gear up, will perform the system test

- GPWS FAULT amber It illuminates on CAP.
 - G/S amber lights illuminate on both pilots panels.
 - Voice alert "GLIDE SLOPE" is given.
 - One second time delay.
 - GPWS red lights illuminate on both pilots panels.
 - Voice alert "WHOOH WHOOH PULL UP" is given several times.
 - GPWS red lights extinguish.
 - G/S lights and GPWS FAULT light will extinguish as soon as the pb is released.
- * Below 1000 ft, will inhibit the mode 5 alerts (aural and visual).

GPWS SELECTOR



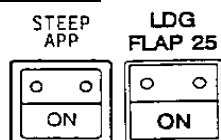
The selector is guarded in the NORM position

NORM All alerts are operative.

FLAP OVRD Mode 4 alert caused by flap extension, at less than landing configuration is inhibited to avoid nuisance warnings in case of landing with reduced flap setting.

OFF All mode alerts are inhibited.

STEAP APP PB



The STEAP APP pb modifies the SINK RATE envelope, illuminates blue when pressed in. Each time the "STEAP APP" pb is selected, the "LDG FLAP 25" pb is released if already selected.

It is impossible to select both functions at the same time.

 ATR F.C.O.M.	NAVIGATION SYSTEM GPWS	1.15.40		
		P 7/8	001	
				DEC 95

AA

40.3 ELECTRICAL SUPPLY/SYSTEM MONITORING

ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)	AC BUS SUPPLY (C/B)
GPWS computer	– Nil –	115 VAC BUS 2 (on overhead panel CMPTR)
GPWS alerts	DC BUS 1 (on overhead panel WARN)	– Nil –
GPWS FAULT IND	DC BUS 2 (on overhead panel)	– Nil –

SYSTEM MONITORING

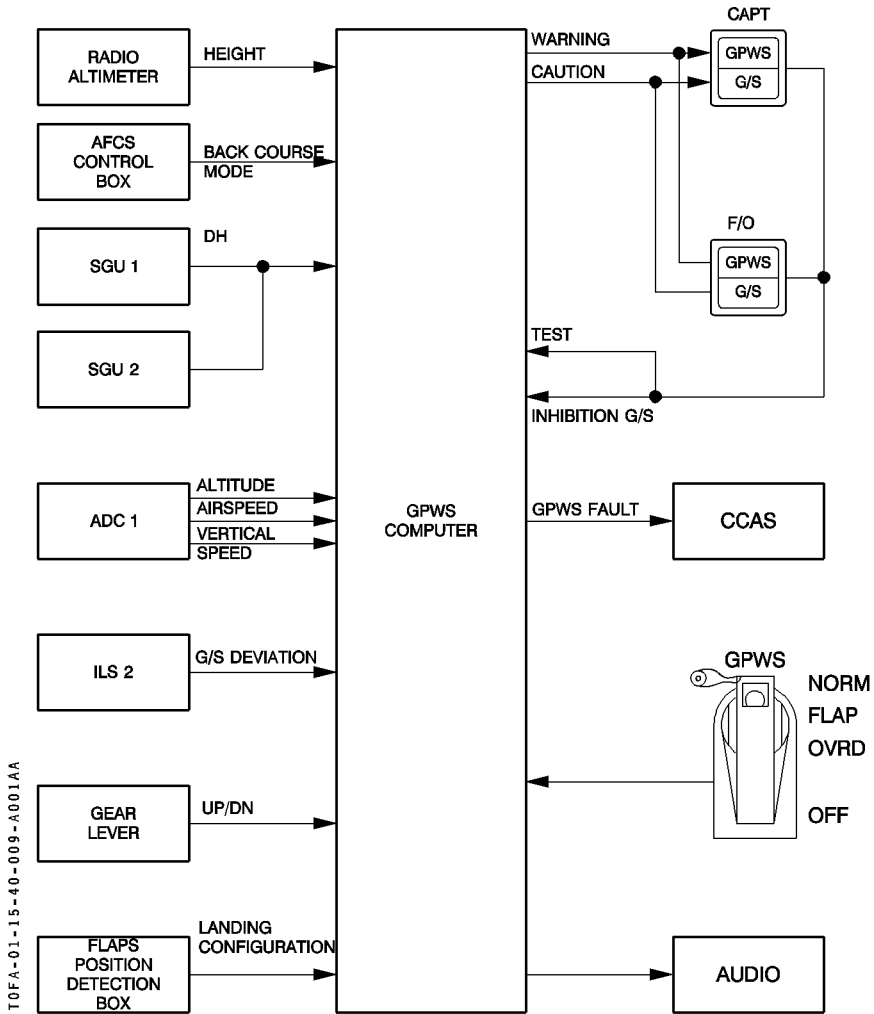
The following conditions are monitored by visual alert :

- GPWS Computer internal failure or power supply loss or input supply loss.
 - GPWS FAULT amber light illuminates on CAP.

 ATR F.C.O.M.	NAVIGATION SYSTEM	1.15.40		
		P 9/10	001	
				DEC 95

AA

40.4 SCHEMATIC



 ATR F.C.O.M.	NAVIGATION SYSTEM	1.15.50		
		P 1	001	
	WEATHER RADAR			DEC 95

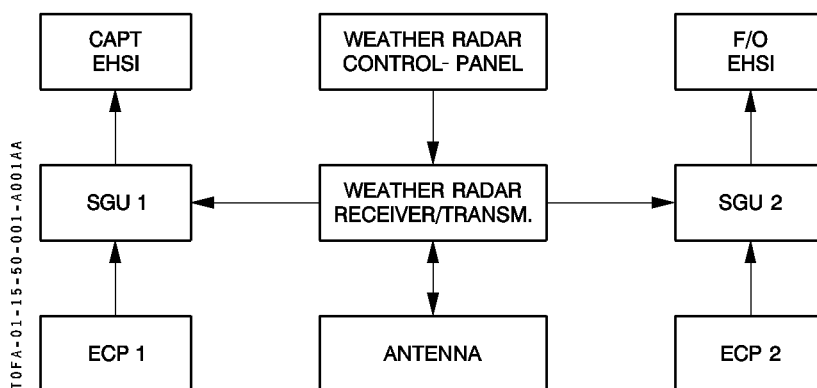
AA

50.1 DESCRIPTION

Weather radar system is designed for weather impediments detection, up to 300 NM in a 45 degree sector on each side of aircraft path.

Weather impediments are displayed on the EHSI(S) in ARC mode, in 4 colors according to the intensity of rain detected.

Weather radar can also be used in MAP mode to display ground obstacles.



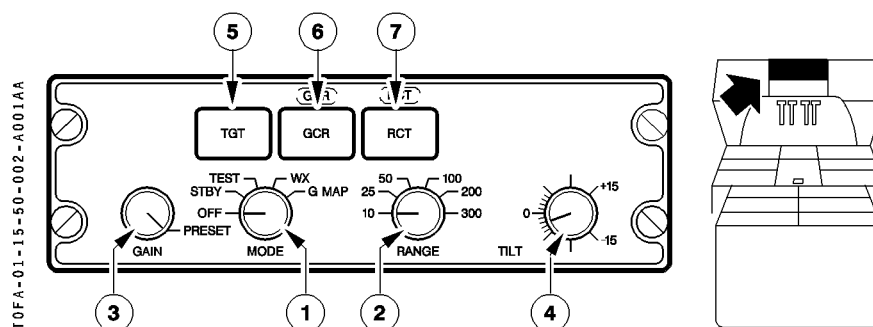
System is controlled with the weather radar control panel. Modes selected on this panel are displayed on top of the EHSI.

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.50	
			P 2	001
	WEATHER RADAR			DEC 95

AA

50.2 CONTROLS

WEATHER RADAR CONTROL PANEL



① Mode selector

Enables selection of radar functioning mode.

OFF position : Radar receiver/transmitter is switched off.

STBY position : Radar receiver/transmitter is switched on, but no pulse is sent by antenna.

TEST : Enables a check of radar operation.

– Range is automatically selected on 100 NM

– Three arcs of circle appear on EHSI, with green, yellow and red colors + an arc predominantly green between 85 and 95 NM

– Selected mode appears on top left of EHSI (STBY, TEST, WX, G MAP)

WX position : Normal operating position.

Intensity of weather obstacles is displayed by different colors.

Level 0 : Black No detectable cloud

Level 1 : Green normal cloud

Level 2 : Yellow Dense cloud

Level 3 : Red Severe storm

G MAP position : Enables to display ground obstacles.

Another color scale is used for this mode.

Level 0 : Black

Level 1 : Pale blue

Level 2 : Yellow

Level 3 : Magenta

R

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.50		
	WEATHER RADAR		P 1	010	
					NOV 99

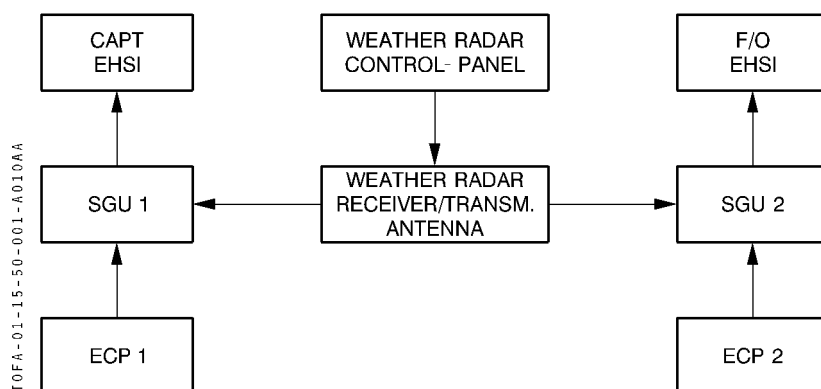
AA

50.1 DESCRIPTION

Weather radar system is designed for weather impediments detection, up to 300 NM in a 45 degree sector on each side of aircraft path.

Weather impediments are displayed on the EHSI(S) in ARC mode, in 4 colors according to the intensity of rain detected.

Weather radar can also be used in MAP mode to display ground obstacles.



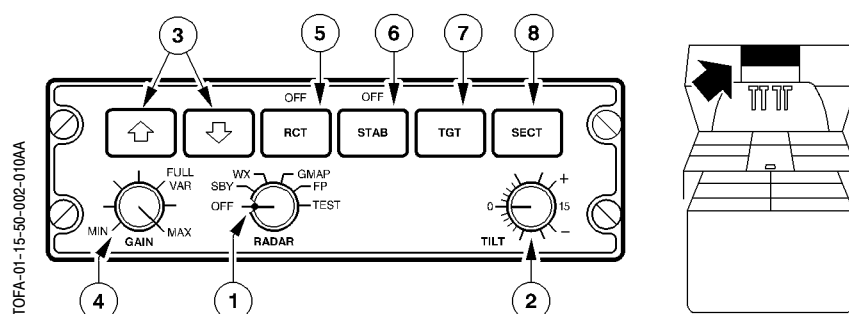
System is controlled with the weather radar control panel. Modes selected on this panel are displayed on the EHSI.

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.50	
	WEATHER RADAR		P 2	010
				NOV 99

AA

50.2 CONTROLS

WEATHER RADAR CONTROL PANEL



① Mode selector

Enables the selection of the operating mode.

OFF position : The radar system is turned off (WX displayed amber on the EFIS).

SBY position : (STBY displayed green on the EFIS) Places the radar in a ready state with the antenna scan stopped and the transmitter inhibited.

WX position : (WX displayed green on the EFIS) Selects the weather detection mode, displaying five different levels.

Level 0 : Black No detectable cloud

Level 1 : Green Moderate storm

Level 2 : Yellow Less severe storm

Level 3 : Red Strong storm

Level 4 : Magenta Intense storm

On the ground, the system is automatically forced in SBY position for safety. If needed, it is possible to restore the active WX mode by pushing the STAB button four times in three seconds.

GMAP position : (GMAP displayed green on the EFIS) Selects the ground mapping mode using four different levels.

Level 0 : Black No return

Level 1 : Cyan Least reflective return

Level 2 : Yellow Moderate return

Level 3 : Magenta Strong return

FP position : (FPLN displayed green on the EFIS). Clears the screen of radar data and put it in the flight plan mode. The target alert mode (TGT) can be used in FP mode.

TST position : (TEST displayed on the EFIS) displays a test pattern to verify the system.

	NAVIGATION SYSTEM	1.15.50		
		P 3	001	
	WEATHER RADAR			DEC 95

AA

- ② Range selector
Enables to select the distance scale. Two concentric arcs of circle are displayed on the EHSI. Large one represents the selected distance scale. Small one is half scale, with corresponding distance displayed along this arc.
- ③ GAIN setting
Is used to set receiving amplification. According to this setting, the color distribution changes.
A PRESET position may be selected, on which the gain is automatically set.
- ④ TILT control
Is used to adjust radar antenna in pitch axis from 15° down to 15° UP.
- ⑤ TGT pb
Activates target (TGT) alert
This button is only used in weather mode (WX) with the gain setting in the PRESET position.
- ⑥ GCR pb
Activates Ground Clutter Reduction (GCR) function.
This mode may be used up to 100 NM range to discriminate echoes usually coming from the ground.
When selected, the weather radar display appears dimmed, and an amber "GCR" on the top left of EHSI, and the GCR legend located above the GCR pb illuminate.
- ⑦ RCT pb
Activates Rain Echo Attenuation Compensation Technique (RCT) function, in WX mode, on any range.
This function allows to more precisely display the weather situation behind storms (red zones).
Gain is automatically set according to level of return pulses.
When the weather situation in considered zones cannot be determined, they are displayed in blue.
If weather obstacles are seen, they are displayed in red.
When operated, a green "RCT" comes on top left of EHSI and the RCT legend located above the RCT pb illuminates.

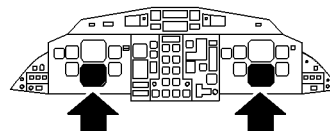
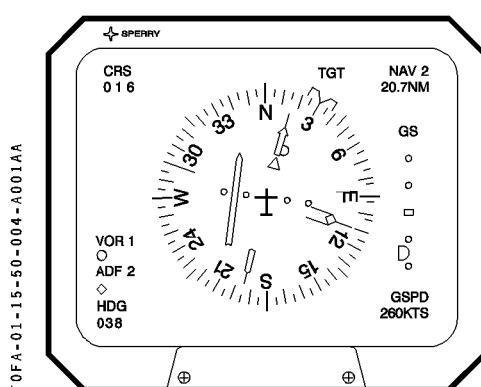
	NAVIGATION SYSTEM		1.15.50		
			P 4	001	
	WEATHER RADAR				DEC 95

AA

EHSI DISPLAY

TGT ALERT

Available in FULL or ARC mode.



TGT or VAR annunciator

- TGT illuminates green when the target mode is selected and turns amber when a weather level 3 obstacle is detected within the target alert sector (range from 60 to 120 Nm and within ± 7.5 degrees of aircraft heading).
- VAR illuminates amber when the gain setting is not in the PRESET position.

WEATHER MODE

Weather radar display is only available in ARC mode.

	NAVIGATION SYSTEM		1.15.50	
	WEATHER RADAR		P 3	010
				NOV 99

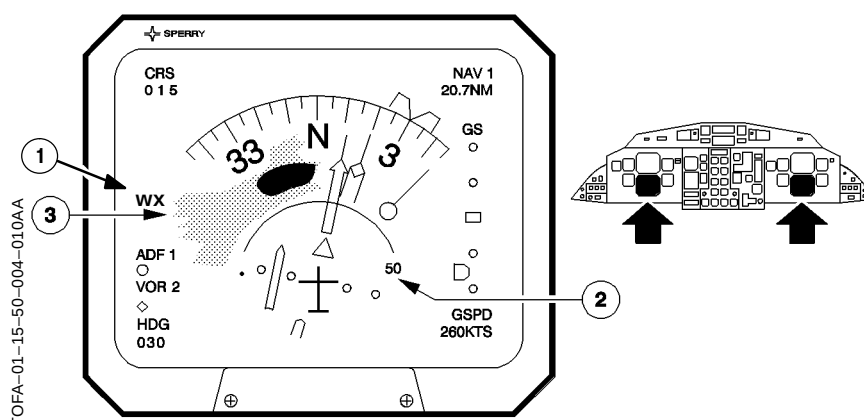
AA

- ② TILT control
Is used to adjust the antenna pitch from 15° down to 15° up.
- ③ RANGE push buttons
Select the different operating ranges from 5 to 300 NM. In the FP mode, additional ranges of 500 and 1000 miles are available.
- ④ GAIN rotary control and push/pull switch
When the switch is pushed, the system enters the preset, calibrated gain mode, in this mode, the rotary control does nothing.
When the switch is pulled, the system enters the variable gain mode, adjustable by the rotary control (VAR is displayed amber on the EFIS).
- ⑤ RCT push button
Activates or deactivates the REACT mode which compensates for attenuation of the radar signal as it passes through rain fall.
The cyan field indicates areas where further compensation is not possible. Any target detected in these areas will be displayed in magenta and should be considered dangerous.
- ⑥ STAB push button
Turns the pitch and roll stability ON and OFF.
- ⑦ TGT push button
Activates and deactivates the radar target alert mode. When activated, TGT is displayed green on the EFIS and the system monitors beyond the selected range and 7.5° on each side of the aircraft heading.
If a characteristic return is detected in the monitored area, the TGT legend on the EFIS changes from green to amber. TGT alert can only be selected in the WX and FP modes.
- ⑧ SECT push button
Is used to select either the normal 12 looks/mn 120° scan or the faster update 24 looks/mn 60° sector scan.

	NAVIGATION SYSTEM		1.15.50	
	WEATHER RADAR		P 4	010
				NOV 99

AA

EHSI DISPLAY



① Radar Mode Annunciator

Appears as soon as the weather radar is switched on.

- WAIT (green) : corresponds to the radar unit warning up time (is illuminated during 90 seconds)
- STBY (green) : radar is in STBY mode.
- TEST (green) : illuminates green when a test is initiated
- WX :
 - illuminates green when radar is operative
 - illuminates amber to indicate that radar is not working when it is either :
 - . selected ON on EFIS Control Panel (ECP) but OFF on Radar Control box.
 - . or selected ON on both ECP and Radar Control box but antenna is not scanning.
- G MAP (green) : enables to display the ground obstacles
- RCT (green) : Rain Echo Attenuation Compensation Technique mode is engaged.
- TX (magenta) : illuminates when radar operates with the screen dimmed.

② Distance indication (white)

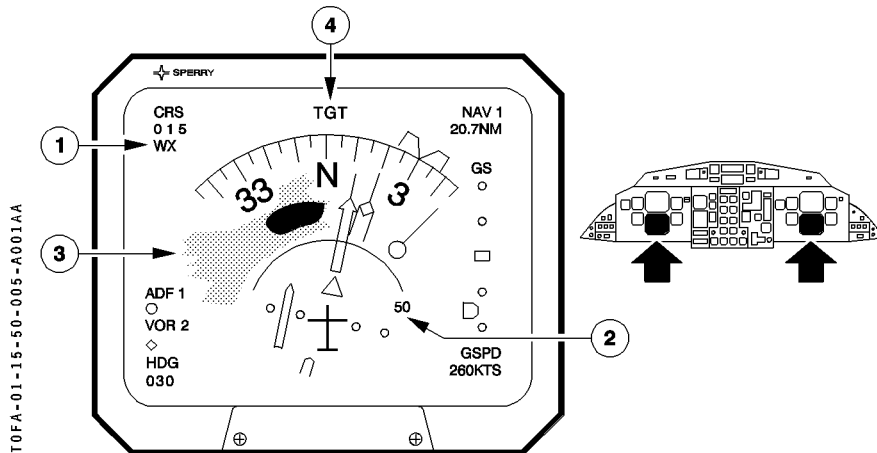
Appears as soon as ARC mode is selected on EHSI.

③ Weather indication

Is displayed in four colors.

	NAVIGATION SYSTEM		1.15.50	
			P 5	001
	WEATHER RADAR			DEC 95

AA



① Radar Mode Annunciator

Appears as soon as the weather radar is switched on.

- WAIT (green) : Corresponds to the radar unit warning up time.
- STBY (green) : Radar is in STBY mode.
- TEST (green) : Illuminates when a test is initiated :
- WX :
 - illuminates green when radar is operative,
 - illuminates amber to indicate that radar is not working when it is either :
 - selected ON on EFIS Control Panel (ECP) but OFF on Radar Control box,
 - or selected ON on both ECP and Radar Control box but antenna is not scanning.
- G MAP (green) : Enables to display the ground obstacles.
- RCT (green) : Rain Echo Compensation Technique mode is engaged.
- GCR (amber) : Ground Clutter Reduction mode is engaged.
- CR/R (amber) : Both RCT and GCR modes are engaged.
- FAIL (amber) : Failure indication.
- TX (magenta) : Illuminates when radar operates with the screen dimmed.

② Distance indication (white)

Appears as soon as ARC mode is selected on EHSI.

③ Weather indication

Is displayed in four colors.

④ TGT or VAR annunciators

	NAVIGATION SYSTEM	1.15.50		
		P 6	001	
	WEATHER RADAR			DEC 95

AA

50.3 ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)	AC BUS SUPPLY (C/B)
Weather radar	DC BUS 1 (on overhead panel 28 VDC)	115 VAC BUS 1 (on overhead panel 115 VAC)

	NAVIGATION SYSTEM	1.15.50		
		P 5	010	
	WEATHER RADAR			NOV 99

AA

LEFT INTENTIONALLY BLANK

	NAVIGATION SYSTEM	1.15.50		
		P 6	001	
	WEATHER RADAR			DEC 95

AA

50.3 ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)	AC BUS SUPPLY (C/B)
Weather radar	DC BUS 1 (on overhead panel 28 VDC)	115 VAC BUS 1 (on overhead panel 115 VAC)

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 1	080	
				NOV 00

AA

60.1 DESCRIPTION

(See schematic P. 11/12)

Using information provided by a constellation of 24 satellites (Bendix-King KLN 90 is able to track up to 8 satellites at a time), GPS is an automatic tridimensional (latitude, longitude, altitude) location and navigation means (KLN 90 is set for KLN 90A(s) or KLN 90B(s) depending on installed version). It also uses data recorded in a data base (two different data bases are available : North American one or International one). The data base is housed in a cartridge plugged into the back of the KLN 90 and is updated every 28 days by means of diskettes and a computer (a jack located on left maintenance panel provides a means of interfacing the KLN 90 with the computer via an interface cable).

Each data base contains information about airports, communication frequencies, VORs, NDBs, Intersections, flight service stations (SID and STAR).

There is also room for up to 250 user defined way points and 25 different flight plans with 30 waypoints each.

Finally, KLN 90 receives indications from ADC and AHRS and gives information to autopilot and SGUs (which are displayed on EHSI).

FUNCTIONS

KLN 90 is capable of performing all the functions associated with great circle navigation.

It mainly allows to perform :

- "Direct to" navigation
- Flight plans navigation
- Navigation to nearest airport (or nearest VOR, NDB...)

and can also be used as a flight calculator.

To know all the functions available, refer to the table of contents of the KLN 90 pilot's guide.

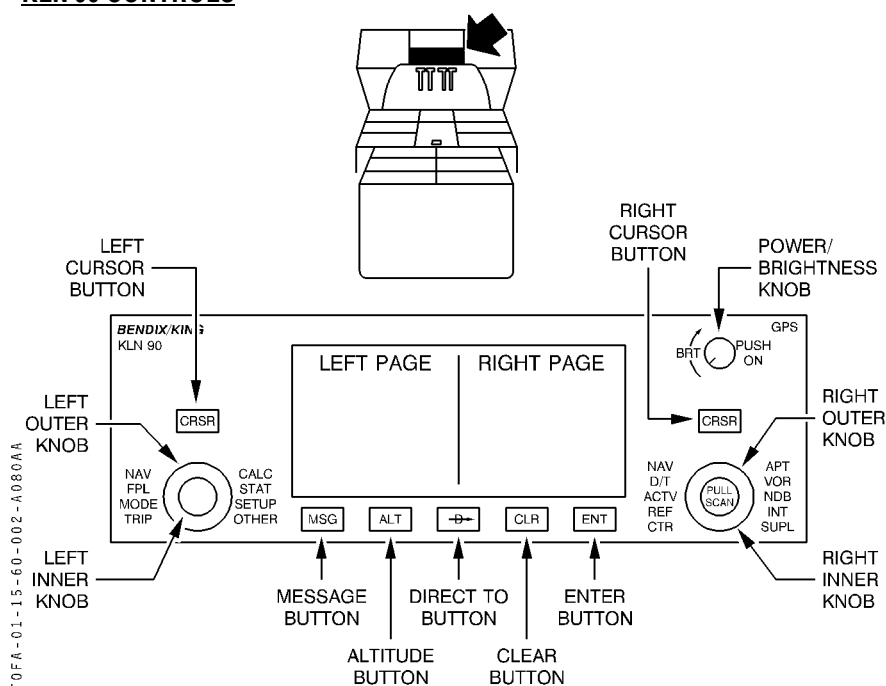
Note : "Fuel Management Pages" described in the pilot's guide are not available.

 ATR F.C.O.M.	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 2	080	
				NOV 00

AA

60.2 CONTROLS

KLN 90 CONTROLS



The screen is normally divided in two sides controlled by two sets of concentric knobs and two cursor buttons. Each can present a variety of information in a number of different page formats.

The various display types can be considered as chapters in a book, each chapter having a many as 26 numbered pages at once. With a few exceptions, each of these pages can be changed independently.

Generally the 2 concentric knobs and the cursor button to the left of the screen are used to select data on LH page, just as the right knobs and cursor on the right control the RH page. The selected page is displayed at the bottom of the screen.

The large outer knobs control the chapters and the small inner knobs turn the pages. To change data in a page use the cursor function. This function is an area of inverse video on the screen brought up by depressing the cursor buttons.

Then rotate the outer knob to position the cursor and the inner knob to select the desired characters. Repeat this operation as many times as necessary and valid (ENT button).

	NAVIGATION SYSTEM		1.15.60	
	GLOBAL NAVIGATION SATELLITE SYSTEM		P 1	090
	GNSS			NOV 01

AA

60.1 DESCRIPTION

(See schematic p. 11/12)

Using information provided by a constellation of 24 satellites (the HT 1000 is able to track up to 12 satellites at a time), GNSS is an automatic tridimensional (latitude, longitude, altitude) location and navigation means. It also uses data recorded in a data base.

R

The data base is stored in the NPU and is updated every 28 days on the ground using a specific data loader. The effective date periods are displayed on the MCDU IDENT page.

The navigation is normally performed using the GPS sensor (GPS mode). In the case where the GPS position becomes unavailable, the dead reckoning mode (DR) is used like a back-up utilizing true airspeed, heading and the last computed wind data.

R

FUNCTIONS

HT 1000 is capable of performing all the functions associated with the great circle navigation.

It mainly allows to perform:

- "Direct To" navigation
- Flight plan navigation
- Navigation to nearest airport (or nearest VOR, NDB...)

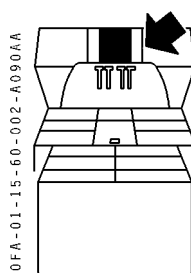
To know all the functions available, refer to the table of contents of the HT 1000 pilot's guide.

	NAVIGATION SYSTEM		1.15.60		
			P 2	090	
	GLOBAL NAVIGATION SATELLITE SYSTEM				NOV 00
	GNSS				

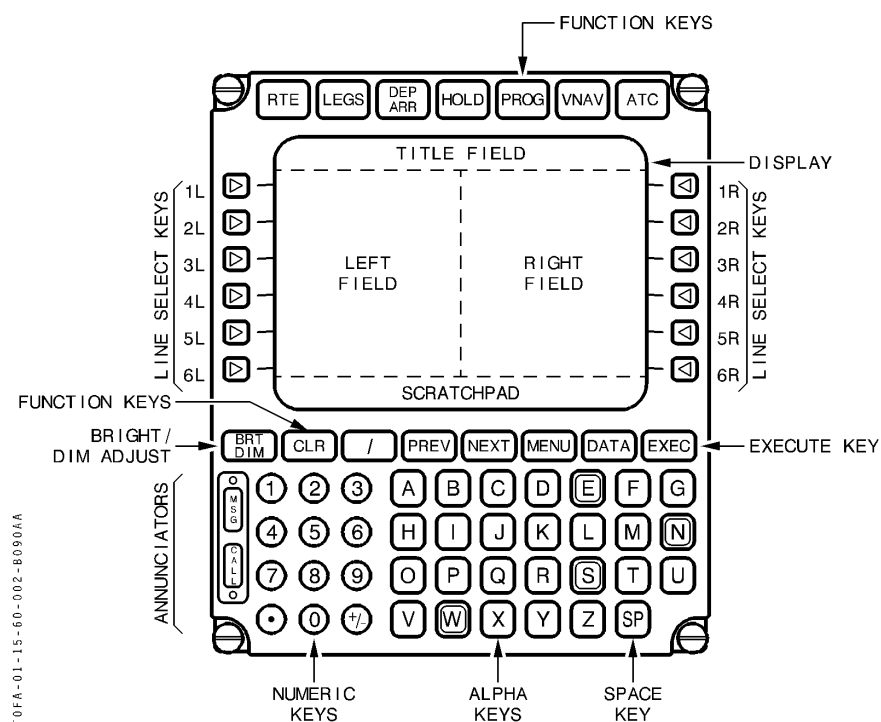
AA

60.2 CONTROLS

HT 1000 CONTROLS



The MCDU is the pilot interface for operation and data entry of the HT 1000 and also displays routes and advisory data on a color 5.5" liquid crystal display. The display has 14 lines of data with 24 characters per line. The MCDU keyboards provides for data input and display selection and control.



	NAVIGATION SYSTEM		1.15.60	
	GLOBAL NAVIGATION SATELLITE SYSTEM		P 1	100
	GNSS			NOV 01

AA

60.1 DESCRIPTION

(See schematic p. 11/12)

Using information provided by a constellation of 24 satellites (the HT 1000 is able to track up to 12 satellites at a time), GNSS is an automatic tridimensional (latitude, longitude, altitude) location and navigation means. It also uses data recorded in a data base.

The data base is stored in the NPU and is updated every 28 days on the ground using a specific data loader. The effective date periods are displayed on the MCDU IDENT page.

The navigation is normally performed using the GPS sensor (GPS mode). In the case where the GPS position becomes unavailable, the HT 1000 reverts to DME-DME mode, if the radio coverage allows it. If not, the dead reckoning mode (DR) is used like a back-up utilizing true airspeed, heading and the last computed wind data.

FUNCTIONS

HT 1000 is capable of performing all the functions associated with the great circle navigation.

It mainly allows to perform:

- "Direct To" navigation
- Flight plan navigation
- Navigation to nearest airport (or nearest VOR, NDB...)

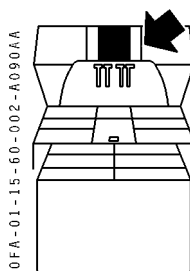
To know all the functions available, refer to the table of contents of the HT 1000 pilot's guide.

	NAVIGATION SYSTEM		1.15.60		
			P 2	090	
	GLOBAL NAVIGATION SATELLITE SYSTEM				NOV 00
	GNSS				

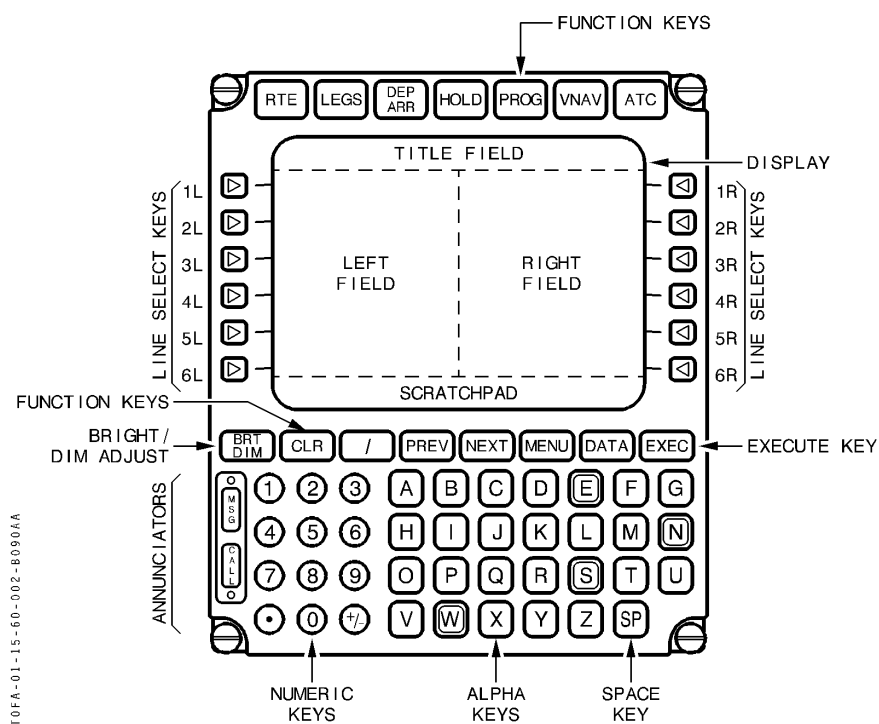
AA

60.2 CONTROLS

HT 1000 CONTROLS



The MCDU is the pilot interface for operation and data entry of the HT 1000 and also displays routes and advisory data on a color 5.5" liquid crystal display. The display has 14 lines of data with 24 characters per line. The MCDU keyboards provides for data input and display selection and control.



	NAVIGATION SYSTEM		1.15.60	
	GLOBAL NAVIGATION SATELLITE SYSTEM		P 1	110
	GNSS			NOV 01

AA

60.1 DESCRIPTION

(See schematic p11/12)

Using information provided by a constellation of 24 satellites (the HT 1000 is able to track up to 12 satellites at a time), GNSS is an automatic tridimensional (latitude, longitude, altitude) location and navigation means. It also uses data recorded in a data base.

The data base is stored in the NPU and is updated every 28 days on the ground using a specific data loader. The effective date periods are displayed on the MCDU IDENT page.

The navigation is normally performed using the GPS sensor (GPS mode). In the case where the GPS position becomes unavailable, the dead reckoning mode (DR) is used like a back-up utilizing true airspeed, heading and the last computed wind data.

FUNCTIONS

HT 1000 is capable of performing all the functions associated with the great circle navigation.

It mainly allows to perform:

- "Direct To" navigation
- Flight plan navigation
- Navigation to nearest airport (or nearest VOR, NDB...)
- Vertical navigation (non coupled to auto pilot)
- Non precision approach

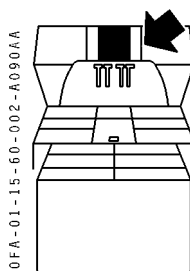
To know all the functions available, refer to the table of contents of the HT 1000 pilot's guide.

	NAVIGATION SYSTEM		1.15.60		
			P 2	090	
	GLOBAL NAVIGATION SATELLITE SYSTEM				NOV 00
	GNSS				

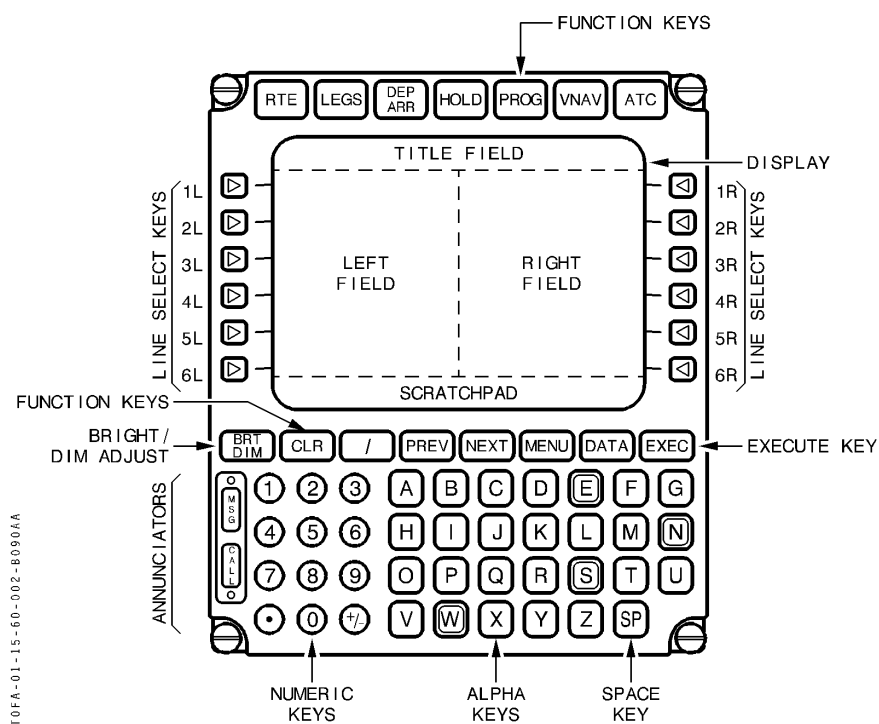
AA

60.2 CONTROLS

HT 1000 CONTROLS



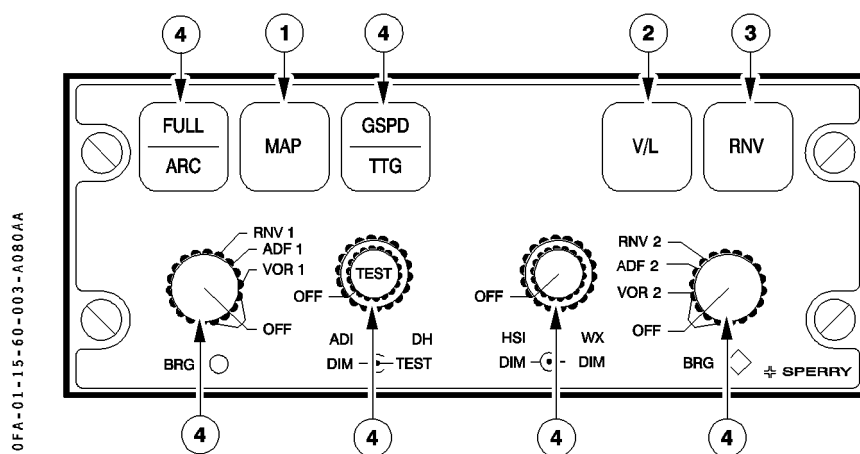
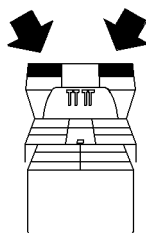
The MCDU is the pilot interface for operation and data entry of the HT 1000 and also displays routes and advisory data on a color 5.5" liquid crystal display. The display has 14 lines of data with 24 characters per line. The MCDU keyboards provides for data input and display selection and control.



	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS		1.15.60		
			P 3	080	
					NOV 00

AA

EFIS CONTROL PANEL

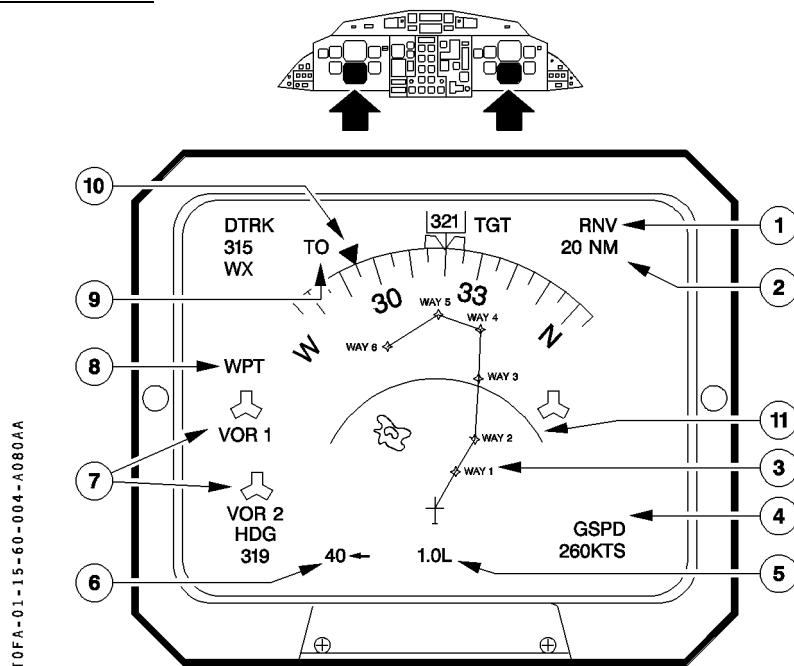


- ① Map pb
Repetitive action on this pb selects alternately MAP display and ARC display on EHSI.
In MAP selection, waypoints of the flight plan are displayed in white except the active waypoint which is magenta.
- ② V/L pb
Action on this pushbutton causes selection of the VOR/LOC mode.
- ③ RNV pb
Action on this pushbutton causes selection of the GPS mode.
- ④ Refer to 1.10.30.

	NAVIGATION SYSTEM		1.15.60		
			P 4	080	
	GLOBAL POSITIONING SYSTEM				MAY 98
	GPS				

AA

EHSI - MAP DISPLAY

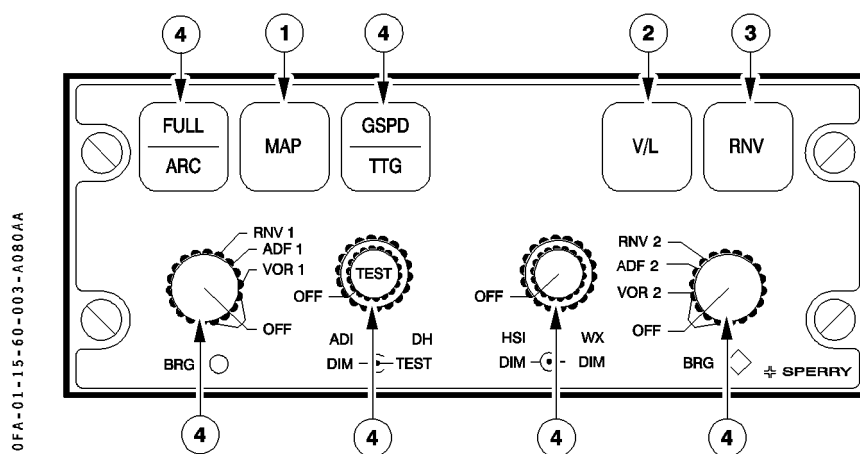
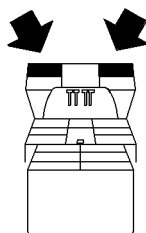


- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Pilot and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Next waypoint (magenta)
 - ✈ indicates a VOR
 - indicates an airport
 - ☆ indicates an ADF, an intersection or a user defined waypoint

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS		1.15.60		
			P 3	080	
					NOV 00

AA

EFIS CONTROL PANEL

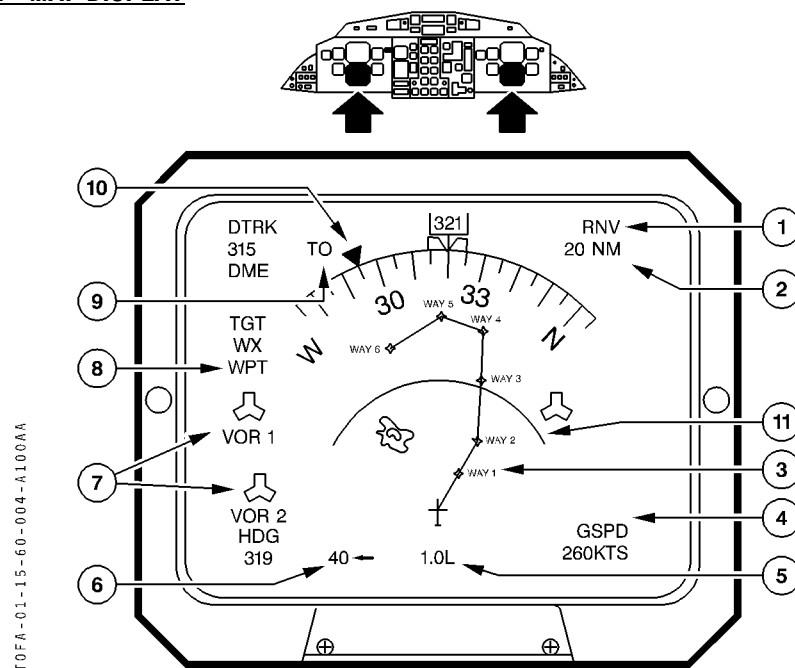


- ① Map pb
Repetitive action on this pb selects alternately MAP display and ARC display on EHSI.
In MAP selection, waypoints of the flight plan are displayed in white except the active waypoint which is magenta.
- ② V/L pb
Action on this pushbutton causes selection of the VOR/LOC mode.
- ③ RNV pb
Action on this pushbutton causes selection of the GPS mode.
- ④ Refer to 1.10.30.

	NAVIGATION SYSTEM		1.15.60		
			P 4	100	
	GLOBAL POSITIONING SYSTEM				NOV 00
	GPS				

AA

EHSI - MAP DISPLAY

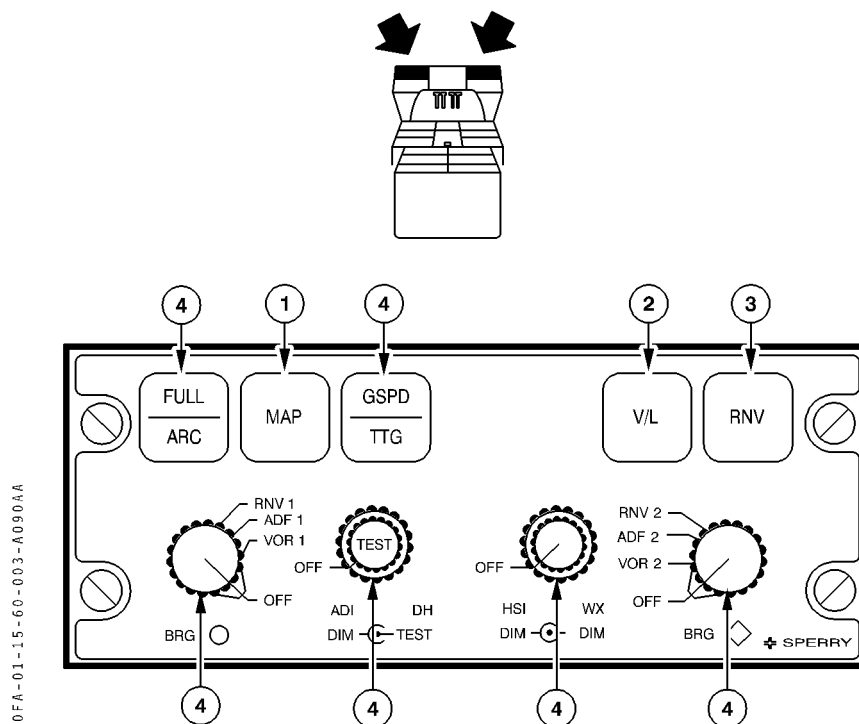


- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Pilot and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Next waypoint (magenta)
 - ✈ indicates a VOR
 - indicates an airport
 - ☆ indicates an ADF, an intersection or a user defined waypoint

	NAVIGATION SYSTEM GLOBAL NAVIGATION SATELLITE SYSTEM		1.15.60	
			P 3	090
	GNSS			NOV 00

AA

EFIS CONTROL PANEL



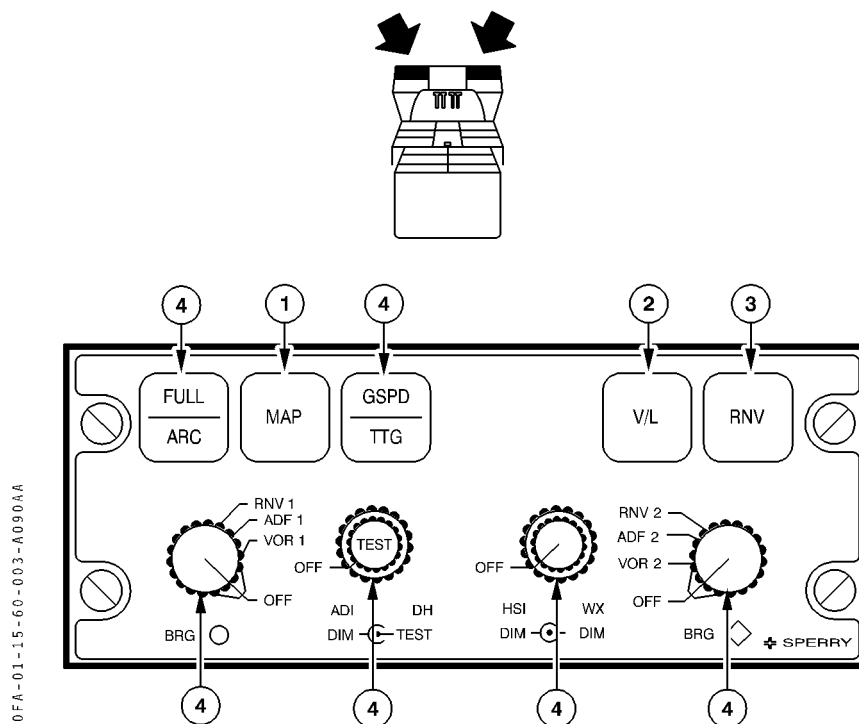
T0FA-01-15-60-003-A0904A

- ① **Map pb**
 Repetitive action on this pb selects alternately MAP display and ARC display on EHSI.
 In MAP selection, waypoints of the flight plan are displayed in white except the active waypoint which is magenta.
- ② **V/L pb**
 Action on this pushbutton causes selection of the VOR/LOC mode.
- ③ **RNV pb**
 Action on this pushbutton causes selection of the GNSS mode.
- ④ **Refer to 1.10.30.**

	NAVIGATION SYSTEM GLOBAL NAVIGATION SATELLITE SYSTEM		1.15.60	
			P 3	090
	GNSS			NOV 00

AA

EFIS CONTROL PANEL



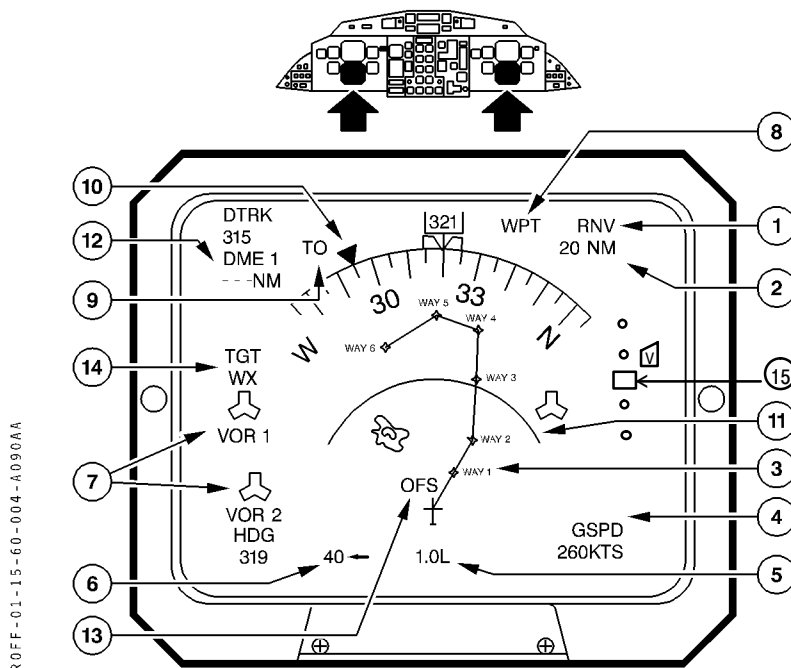
T0FA-01-15-60-003-A0904A

- ① **Map pb**
 Repetitive action on this pb selects alternately MAP display and ARC display on EHSI.
 In MAP selection, waypoints of the flight plan are displayed in white except the active waypoint which is magenta.
- ② **V/L pb**
 Action on this pushbutton causes selection of the VOR/LOC mode.
- ③ **RNV pb**
 Action on this pushbutton causes selection of the GNSS mode.
- ④ **Refer to 1.10.30.**

	NAVIGATION SYSTEM		1.15.60		
			P 4	110	
	GLOBAL NAVIGATION SATELLITE SYSTEM				NOV 00
	GNSS				

AA

EHSI - MAP DISPLAY



- ① **NAV source annunciation**
Identifies the source which supplies the EHSI. This information is blue when only one crew member uses GNSS. It becomes amber when both Pilot and F/O use GNSS as navigation source.
- ② **Distance counter**
Indicates the distance computed by GNSS to the next waypoint.
- ③ **Waypoints**
 - ◇ next waypoint (magenta)
 - ◇ other waypoint (white)
 - indicates an airport
 - ✈ indicates a VOR

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 5	080	
				MAY 98

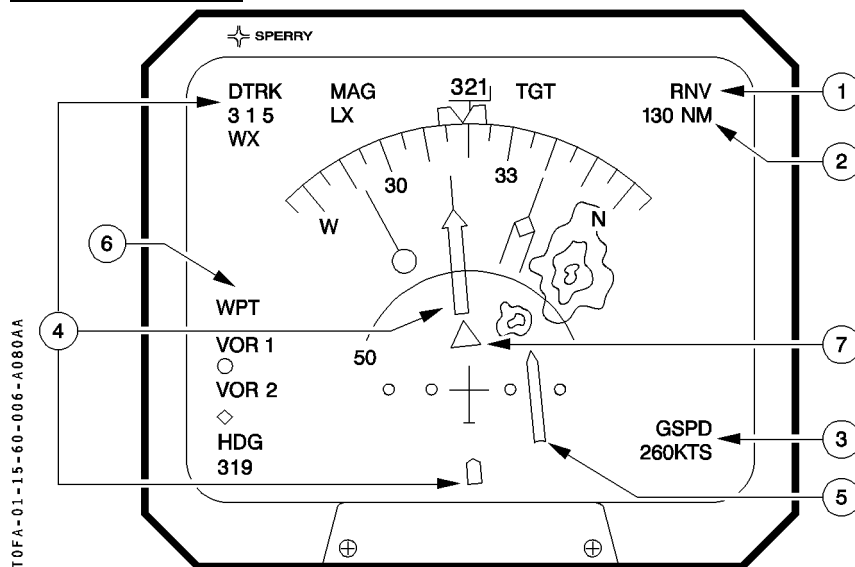
AA

- ④ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ⑤ Track deviation
Indicates in NM and tenths of NM the track deviation to the left (L) or to the right (R).
- ⑥ Wind indicator
An arrow and a figure indicates the direction and the velocity (in kt) of the wind.
- ⑦ VOR symbols
Only VOR/DME will be presented on the MAP display
VOR 1 is displayed in blue
VOR 2 is displayed in green
- ⑧ WPT alerting
Illuminates amber when approaching a waypoint.
- ⑨ TO/FROM indicator (magenta)
- ⑩ Drift angle indicator (magenta)
- ⑪ Radar's range selector may be used to select the distance scale.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM		1.15.60	
			P 6	080
	GPS			MAY 98

AA

EHSI - ARC DISPLAY



- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ④ Desired track indication
- ⑤ Lateral deviation to the track
- ⑥ WPT alerting
Illuminates amber when approaching a waypoint.
- ⑦ TO/FROM annunciator

	NAVIGATION SYSTEM GLOBAL NAVIGATION SATELLITE SYSTEM GNSS	1.15.60		
		P 5	090	
				NOV 00

AA

- ④ Ground speed indicator
Indicates the ground speed calculated by the GNSS.
- ⑤ Track deviation
Indicates in NM and tenths of NM the track deviation to the left (L) or to the right (R) of the intended track.
- ⑥ Wind indicator
An arrow and a figure indicates the direction and the velocity (in kt) of the wind.
- ⑦ VOR/RNV symbols

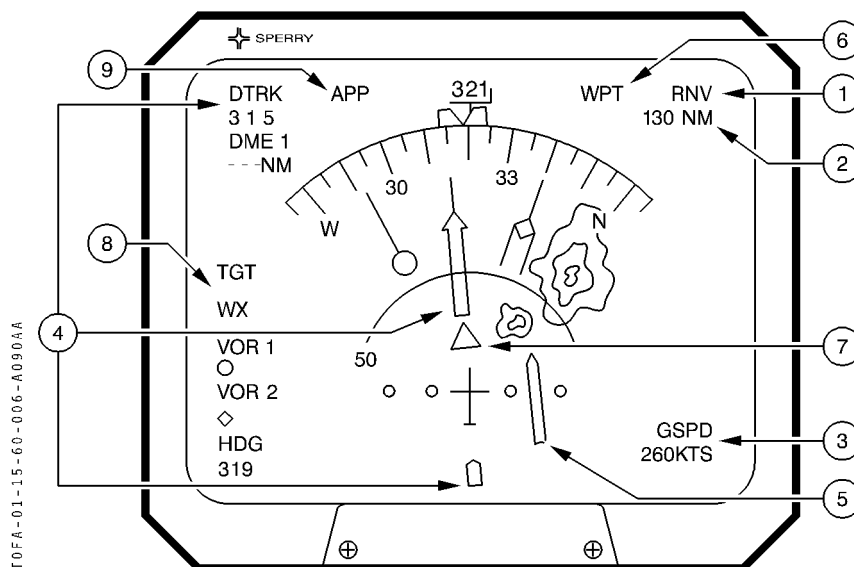
 RVN
 VOR

Only VOR/DME or RNV waypoints will be presented on the MAP display.
VOR/RNV 1 is displayed in blue.
VOR/RNV 2 is displayed in green.
- ⑧ WPT/DGR alerting
WPT illuminates amber when approaching a waypoint
DGR illuminates amber when the "UNABLE RNP" message is displayed on the MCDU.
- ⑨ TO/FROM indicator (magenta)
- ⑩ Drift angle indicator (magenta)
- ⑪ Radar's range selector may be used to select the distance scale.
- ⑫ DME 1/2
Indicates the distance given by DME 1/2.
- ⑬ OFS (cyan)
Indicates that a parallel offset has been activated.
- ⑭ RADAR status

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.60		
	GLOBAL NAVIGATION SATELLITE SYSTEM		P 6	090	
	GNSS				NOV 00

AA

EHSI - ARC DISPLAY



- ① **NAV source annunciation**
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② **Distance counter**
Indicates the distance computed by GPS to the next waypoint.
- ③ **Ground speed indicator**
Indicates the ground speed calculated by the GPS.
- ④ **Desired track indication**
- ⑤ **Lateral deviation to the track**
- ⑥ **WPT/DGR alerting**
WPT illuminates amber when approaching a waypoint
DGR illuminates amber when the "UNABLE RNP" message is displayed on the MCDU.
- ⑦ **TO/FROM annunciator**
- ⑧ **RADAR status**
- ⑨ **APP/OFS**
APP illuminates cyan when in approach phase. (Not applicable)
OFS illuminates cyan when an offset has been activated.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 5	100	
				NOV 00

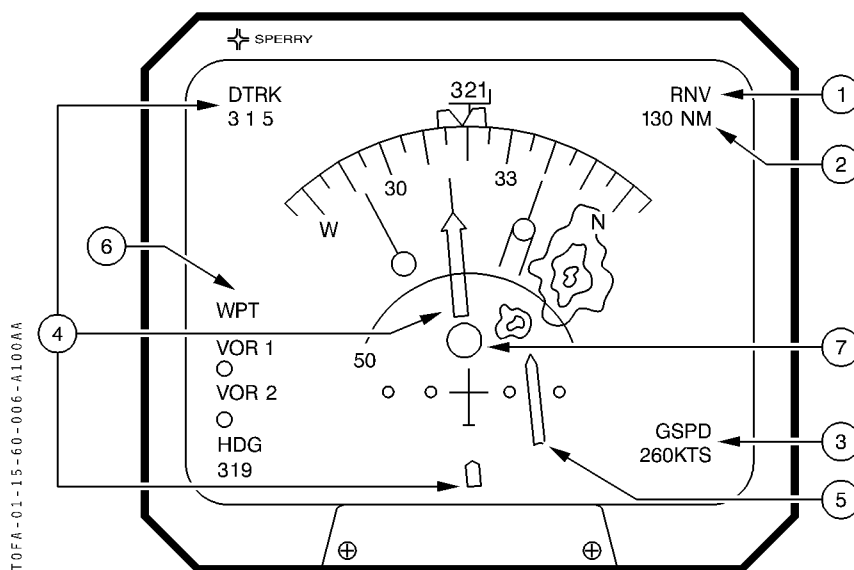
AA

- ④ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ⑤ Track deviation
Indicates in NM and tenths of NM the track deviation to the left (L) or to the right (R).
- ⑥ Wind indicator
An arrow and a figure indicates the direction and the velocity (in kt) of the wind.
- ⑦ VOR symbols
Only VOR/DME will be presented on the MAP display
VOR 1 is displayed in blue
VOR 2 is displayed in green
- ⑧ WPT or DGR alerting
- WPT illuminates amber when approaching a waypoint.
- DGR illuminates amber when the integrity is lost.
- ⑨ TO/FROM indicator (magenta)
- ⑩ Drift angle indicator (magenta)
- ⑪ Radar's range selector may be used to select the distance scale.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM		1.15.60	
			P 6	100
	GPS			NOV 00

AA

EHSI - ARC DISPLAY



- ① **NAV source annunciation**
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② **Distance counter**
Indicates the distance computed by GPS to the next waypoint.
- ③ **Ground speed indicator**
Indicates the ground speed calculated by the GPS.
- ④ **Desired track indication**
- ⑤ **Lateral deviation to the track**
- ⑥ **WPT alerting**
Illuminates amber when approaching a waypoint.
- ⑦ **TO/FROM annunciator**

	NAVIGATION SYSTEM GLOBAL NAVIGATION SATELLITE SYSTEM GNSS	1.15.60		
		P 5	110	
				NOV 00

AA

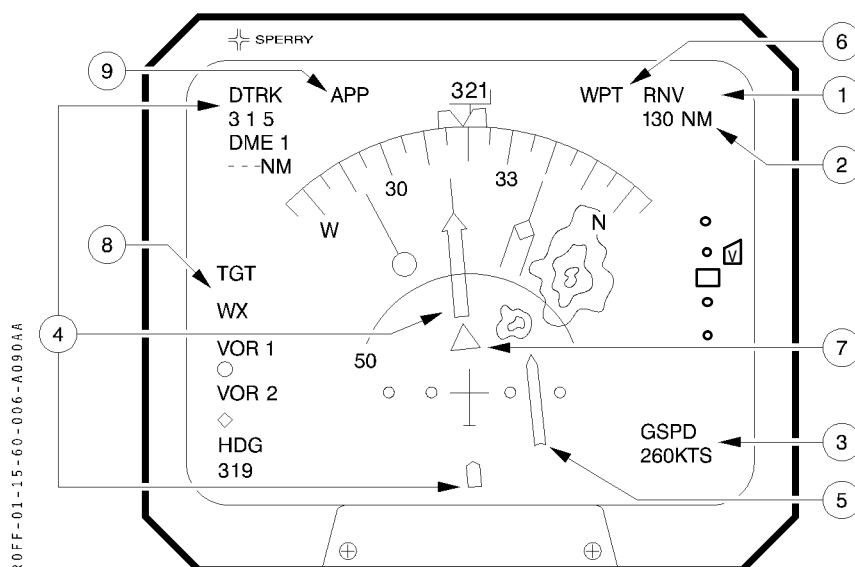
- ④ Ground speed indicator
Indicates the ground speed calculated by the GNSS.
- ⑤ Track deviation
Indicates in NM and tenths of NM the track deviation to the left (L) or to the right (R) of the intended track.
- ⑥ Wind indicator
An arrow and a figure indicates the direction and the velocity (in kt) of the wind.
- ⑦ VOR/RNV symbols

 RNV
 VOR

Only VOR/DME or RNV waypoints will be presented on the MAP display.
VOR/RNV 1 is displayed in blue.
VOR/RNV 2 is displayed in green.
- ⑧ WPT/DGR alerting
WPT illuminates amber when approaching a waypoint
DGR illuminates amber when the "UNABLE RNP" message is displayed on the MCDU.
- ⑨ TO/FROM indicator (magenta)
- ⑩ Drift angle indicator (magenta)
- ⑪ Radar's range selector may be used to select the distance scale.
- ⑫ DME 1/2
Indicates the distance given by DME 1/2.
- ⑬ OFS (cyan)
Indicates that a parallel offset has been activated.
- ⑭ RADAR status
- ⑮ Vertical deviation
Scale and index

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.60		
	GLOBAL NAVIGATION SATELLITE SYSTEM		P 6	110	
	GNSS				NOV 00

AA **EHSI - ARC DISPLAY**

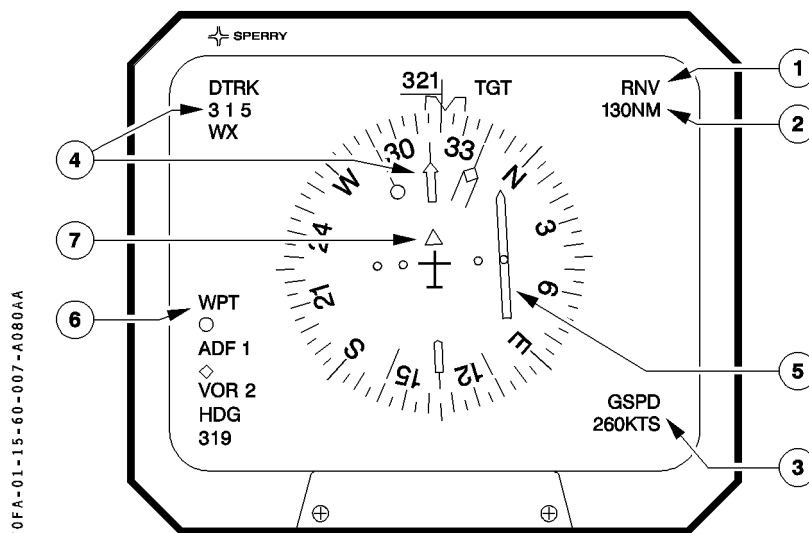


- ① **NAV source annunciation**
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② **Distance counter**
Indicates the distance computed by GPS to the next waypoint.
- ③ **Ground speed indicator**
Indicates the ground speed calculated by the GPS.
- ④ **Desired track indication**
- ⑤ **Lateral deviation to the track**
- ⑥ **WPT/DGR alerting**
WPT illuminates amber when approaching a waypoint
DGR illuminates amber when the "UNABLE RNP" message is displayed on the MCDU.
- ⑦ **TO/FROM annunciator**
- ⑧ **RADAR status**
- ⑨ **APP/OFS**
APP illuminates cyan when in approach phase.
OFS illuminates cyan when an offset has been activated.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 7	080	
				MAY 98

AA

EHSI - FULL MODE



- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ④ Desired track indication
- ⑤ Lateral deviation to the track
- ⑥ WPT alerting
Illuminates amber when approaching a waypoint.
- ⑦ TO/FROM annunciator

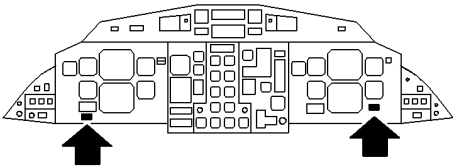
	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM (GPS)	1.15.60		
		P 8	080	
				MAY 98

AA

GPS RAIM FAULT lights

T0FA-01-15-60-008-A080AA

GPS RAIM
FAULT



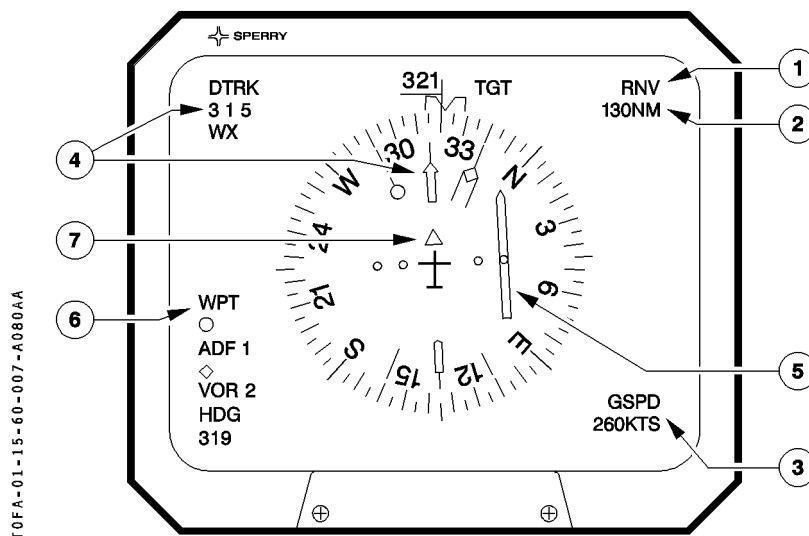
(RAIM = Receiver Autonomous Integrity Monitoring)

R FAULT illuminate amber when RAIM function is lost.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 7	080	
				MAY 98

AA

EHSI - FULL MODE



- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ④ Desired track indication
- ⑤ Lateral deviation to the track
- ⑥ WPT alerting
Illuminates amber when approaching a waypoint.
- ⑦ TO/FROM annunciator

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 8	100	
				MAY 98

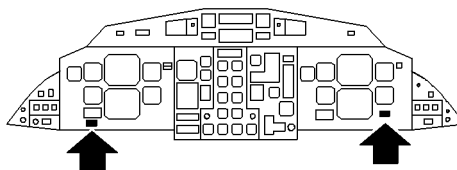
AA

"RNV MSG" lights

T0FA-01-15-60-008-A100AA

RNV MSG

MSG

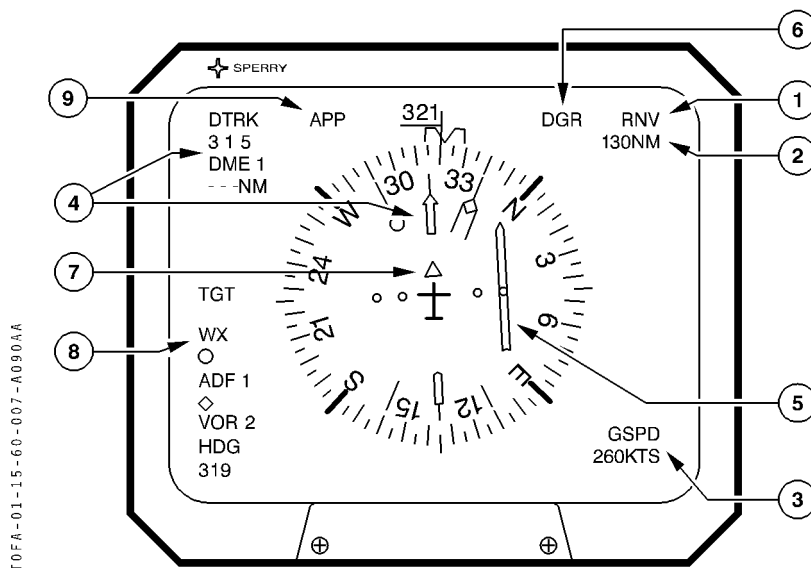


"RNV MSG" illuminates amber on EADI when a message appears on the GPS screen or when RAIM function is lost.
RNV MSG will extinguish when these cases are taken into account (MSG pb on GPS control panel).

	NAVIGATION SYSTEM		1.15.60		
			P 7	090	
	GLOBAL NAVIGATION SATELLITE SYSTEM				NOV 00
	GNSS				

AA

EHSI - FULL MODE

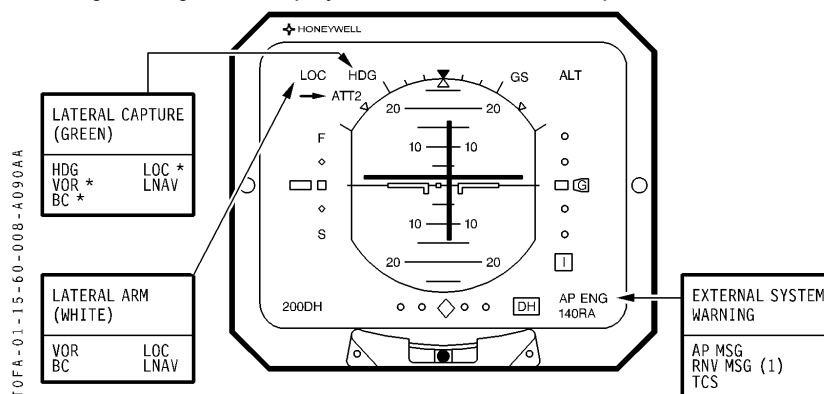


- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ④ Desired track indication
- ⑤ Lateral deviation to the track
- ⑥ WPT/DGR alerting
WPT illuminates amber when approaching a waypoint
DGR illuminates amber when the "UNABLE RNP" message is displayed on the MCDU.
- ⑦ TO/FROM annunciator
- ⑧ RADAR status
- ⑨ APP/QFS
APP illuminates cyan when in approach phase. (Not applicable)
OFS illuminates cyan when an offset has been activated.

	NAVIGATION SYSTEM		1.15.60		
			P 8	090	
	GLOBAL NAVIGATION SATELLITE SYSTEM				NOV 00
	GNSS				

AA **EADI**

Alerting messages and displays related to the HT 1000 operation.



- (1) RNV MSG is triggered by one of the following messages displayed on the MCDU:
- UNABLE RNP: message annunciated when ANP exceeds RNP or integrity is greater than twice the selected RNP (Once the value for approach). The conditions for displaying this message are flight phase dependent as follows:

PHASE OF FLIGHT	DEFAULT RNP (NM)	Unable RNP Time to Alarm (s)
OCEANIC	12	80
EN ROUTE	2	80
TERMINAL	1	60
APPROACH *	0.3	10

* Not applicable

- DEAD RECKONING: message annunciated when NAV source becomes dead reckoning (GPS and DME modes are lost).
- VERIFY RNP ENTRY: message annunciated when the pilot entered RNP is greater than default current RNP.
- VERIFY RNP-POS REF: message annunciated when flight phase changes and current pilot entered RNP is greater than the default RNP for new flight mode.
- UNABLE APPROACH: message annunciated when within 2 NM from the FAF, and RAIM prediction at FAF/MAP fails, or navigation source is not GPS.

In addition there are some advisory messages such as:

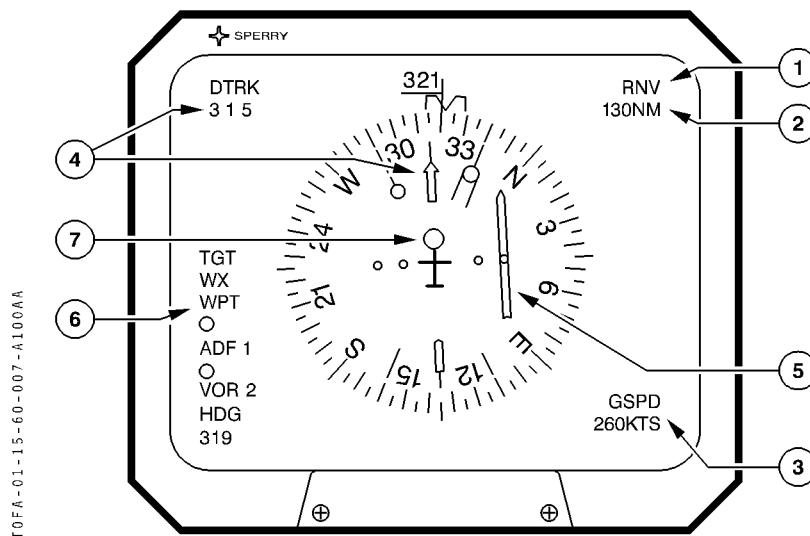
- RAIM LIMIT EXCEEDS XX NM: message annunciated when the GPS RAIM protection Limit exceeds TSO-C129 requirement for current flight phase.
- CHECK DEST RAIM-POS REF: message annunciated within 30 NM of destination airport if active route contains approach and approach RAIM predicted to be non available for some period of time within 15 minutes of destination ETA.

RNV MSG will extinguish when the associated MCDU message is cancelled.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 7	100	
				NOV 00

AA

EHSI - FULL MODE

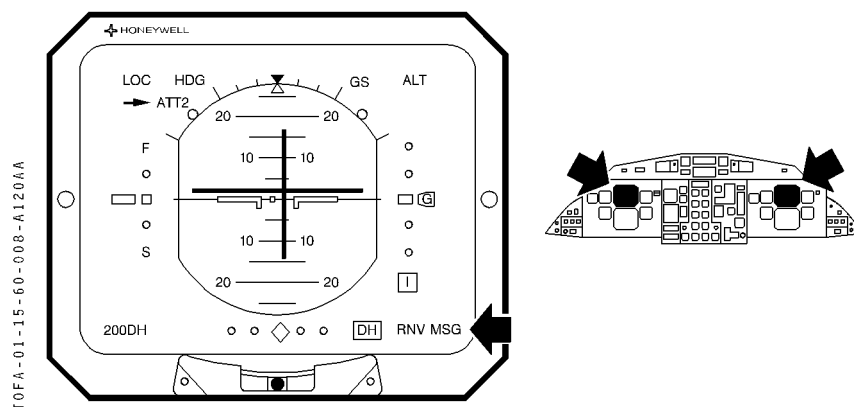


- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ④ Desired track indication
- ⑤ Lateral deviation to the track
- ⑥ WPT alerting
Illuminates amber when approaching a waypoint.
- ⑦ TO/FROM annunciator

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 8	120	
				NOV 00

AA

“RNV MSG” lights



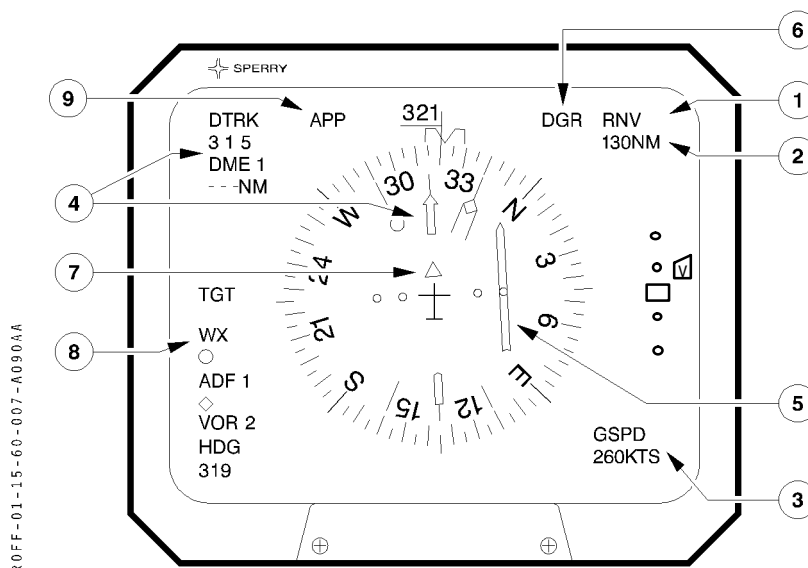
“RNV MSG” illuminates amber on EADI when a message appears on the GPS screen or when RAIM function is lost.

RNV MSG will extinguish when these cases are taken into account (MSG pb on GPS control panel).

	NAVIGATION SYSTEM		1.15.60		
			P 7	110	
	GLOBAL NAVIGATION SATELLITE SYSTEM				NOV 00
	GNSS				

AA

EHSI - FULL MODE

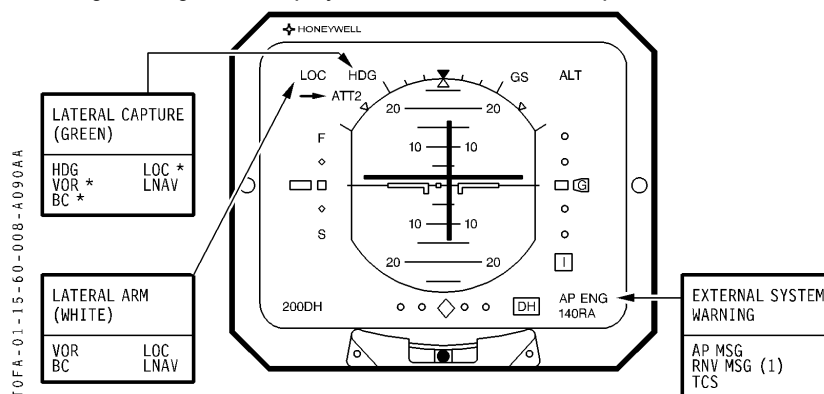


- ① NAV source annunciation
Identifies the source which supplies the EHSI.
This information is blue when only one crew member uses GPS. It becomes amber when both Capt and F/O use GPS as navigation source.
- ② Distance counter
Indicates the distance computed by GPS to the next waypoint.
- ③ Ground speed indicator
Indicates the ground speed calculated by the GPS.
- ④ Desired track indication
- ⑤ Lateral deviation to the track
- ⑥ WPT/DGR alerting
WPT illuminates amber when approaching a waypoint
DGR illuminates amber when the "UNABLE RNP" message is displayed on the MCDU.
- ⑦ TO/FROM annunciator
- ⑧ RADAR status
- ⑨ APP/OFS
APP illuminates cyan when in approach phase.
OFS illuminates cyan when an offset has been activated.

	NAVIGATION SYSTEM GLOBAL NAVIGATION SATELLITE SYSTEM GNSS		1.15.60		
			P 8	110	
					NOV 00

AA **EADI**

Alerting messages and displays related to the HT 1000 operation.



- (1) RNV MSG is triggered by one of the following messages displayed on the MCDU:
- UNABLE RNP: message annunciated when ANP exceeds RNP or integrity is greater than twice the selected RNP (Once the value for approach). The conditions for displaying this message are flight phase dependent as follows:

PHASE OF FLIGHT	DEFAULT RNP (NM)	Unable RNP Time to Alarm (s)
OCEANIC	12	80
EN ROUTE	2	80
TERMINAL	1	60
APPROACH *	0.3	10

* Not applicable

- DEAD RECKONING: message annunciated when NAV source becomes dead reckoning (GPS and DME modes are lost).
- VERIFY RNP ENTRY: message annunciated when the pilot entered RNP is greater than default current RNP.
- VERIFY RNP-POS REF: message annunciated when flight phase changes and current pilot entered RNP is greater than the default RNP for new flight mode.
- UNABLE APPROACH: message annunciated when within 2 NM from the FAF, and RAIM prediction at FAF/MAP fails, or navigation source is not GPS.
- VERTICAL TRACK CHANGE ALERT
This message and annunciator is displayed prior reaching a vertical track change.
- END OF DESCENT
This message appears whenever the aircraft reaches the last altitude constraint on the descent path.

 ATR F.C.O.M.	NAVIGATION SYSTEM		1.15.60		
			GLOBAL POSITIONING SYSTEM		
	(GPS)		P 9	080	
					NOV 96

AA

60.3 ELECTRICAL SUPPLY/SYSTEM MONITORING

ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY
GPS	DC BUS 2 (on overhead panel GPS)

SYSTEM MONITORING

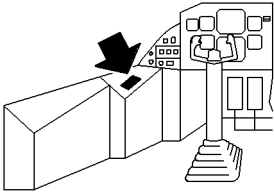
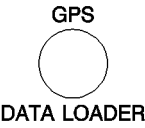
- R The following conditions are monitored by visual alert :
- R – The number and/or the geometry of the received satellites are not sufficient for the
- R RAIM to assure the positioning reliability.*
- R – One of the received and used satellites is not valid. The position is erroneous.**
- R • GPS RAIM FAULT light illuminates amber.
- R The crew can find the right origin of the alert by viewing the MESSAGE page of the
- R GPS.
- R * In that case the crew may consider GPS information but must crosscheck with
- R usual means of navigation.
- R ** In that case the crew has to use only usual means of navigation.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 10	080	
				NOV 00

AA

60.4 LATERAL MAINTENANCE PANEL

TOFA-01-15-60-010-A080AA



This jack enables to connect a computer to update the data base.

	NAVIGATION SYSTEM GLOBAL NAVIGATION SATELLITE SYSTEM GNSS	1.15.60		
		P 9	090	
				NOV 00

AA

60.3 ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY
GNSS	DC STBY BUS (on overhead panel GPS)

	NAVIGATION SYSTEM	1.15.60		
	GLOBAL NAVIGATION SATELLITE SYSTEM	P 10	090	
	GNSS			NOV 00

AA

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	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 9	100	
				MAY 98

AA

60.3 ELECTRICAL SUPPLY/SYSTEM MONITORING

ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY
GPS	DC BUS 2 (on overhead panel GPS)

SYSTEM MONITORING

The following conditions are monitored by visual alert :

- The number and/or the geometry of the received satellites are not sufficient for the RAIM to assure the positioning reliability.*
- One of the received and used satellites is not valid. The position is erroneous.**
- If a local message or a system failure are detected.
There are no priority of displayed message for RAIM function.
 - RNV MSG light illuminates amber.

The crew can find the right origin of the alert by viewing the MESSAGE page of the GPS.

* In that case the crew may consider GPS information but must crosscheck with usual means of navigation.

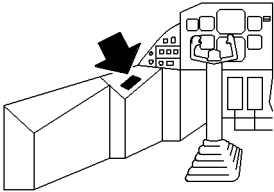
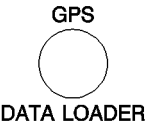
** In that case the crew has to use only usual means of navigation.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 10	080	
				NOV 00

AA

60.4 LATERAL MAINTENANCE PANEL

TOFA-01-15-60-010-A080AA



This jack enables to connect a computer to update the data base.

	NAVIGATION SYSTEM GLOBAL NAVIGATION SATELLITE SYSTEM GNSS	1.15.60		
		P 9	110	
				NOV 00

AA

- R In addition there are some advisory messages such as:
- R - RAIM LIMIT EXCEEDS XX NM: message annunciated when the GPS RAIM protection Limit exceeds TSO-C129 requirement for current flight phase.
 - R - CHECK DEST RAIM-POS REF: message annunciated within 30 NM of destination airport if active route contains approach and approach RAIM predicted to be non available for some period of time within 15 minutes of destination ETA.-
 - R - RNV MSG will extinguish when the associated MCDU message is cancelled.

60.3 ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY
GNSS	DC STBY BUS (on overhead panel GPS)

	NAVIGATION SYSTEM	1.15.60		
	GLOBAL NAVIGATION SATELLITE SYSTEM	P 10	090	
	GNSS			NOV 00

AA

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	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 9	120	
				NOV 00

AA

60.3 ELECTRICAL SUPPLY/SYSTEM MONITORING

ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY
GPS	DC BUS 2 (on overhead panel GPS)

SYSTEM MONITORING

The following conditions are monitored by visual alert :

- The number and/or the geometry of the received satellites are not sufficient for the RAIM to assure the positioning reliability.*
- One of the received and used satellites is not valid. The position is erroneous.**
- If a local message or a system failure are detected.
There are no priority of displayed message for RAIM function.
 - RNV MSG illuminates amber on EADI.
 - DGR illuminates amber on EHSI.

The crew can find the right origin of the alert by viewing the MESSAGE page of the GPS.

* In that case the crew may consider GPS information but must crosscheck with usual means of navigation.

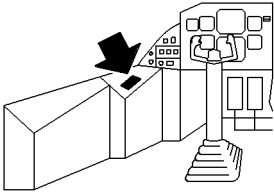
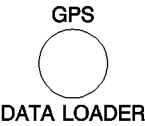
** In that case the crew has to use only usual means of navigation.

	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 10	080	
				NOV 00

AA

60.4 LATERAL MAINTENANCE PANEL

TOFA-01-15-60-010-A080AA



This jack enables to connect a computer to update the data base.

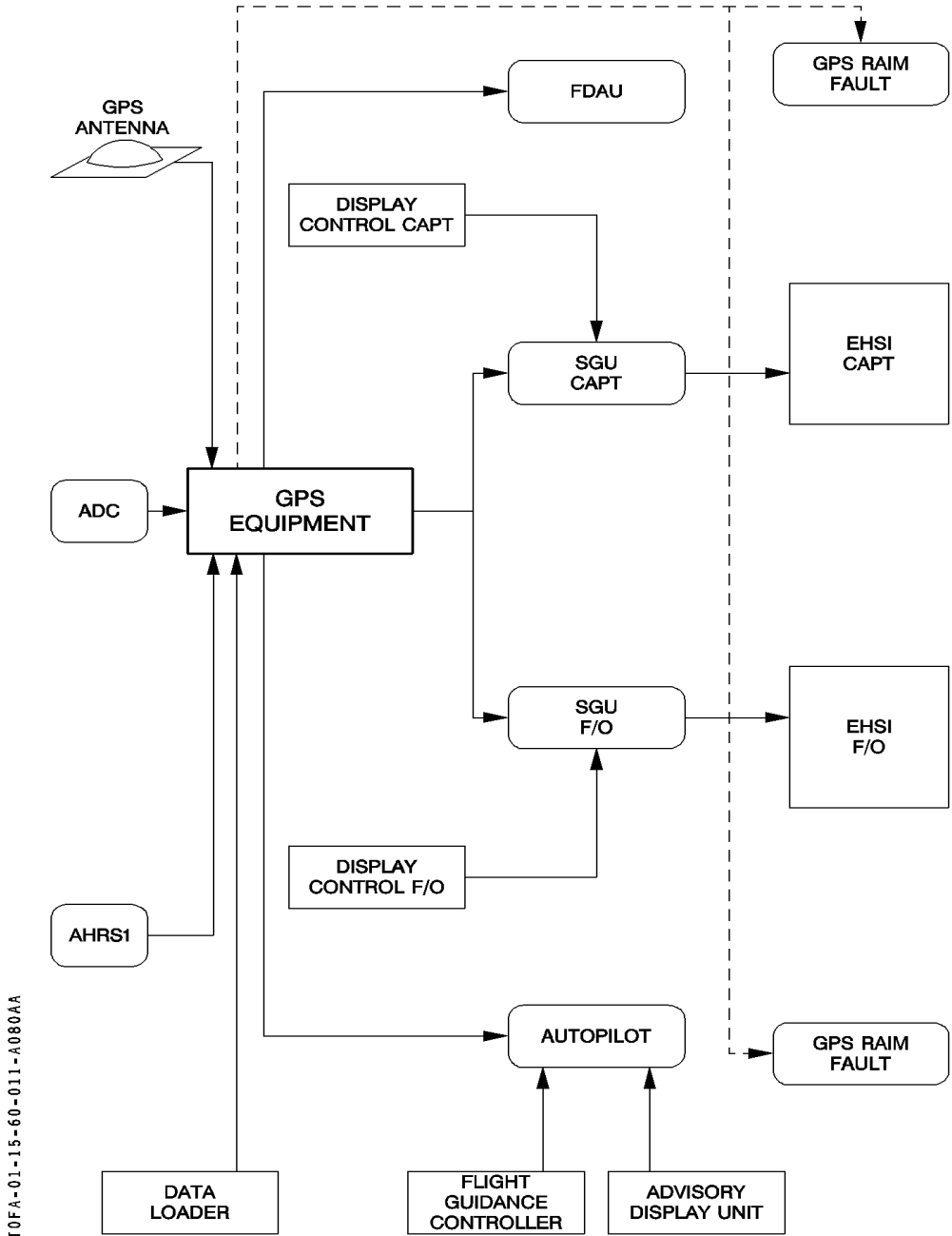
	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM (GPS)	1.15.60		
		P 11/12	080	
				MAI 98

AA

60.5 SCHEMATIC

R

R

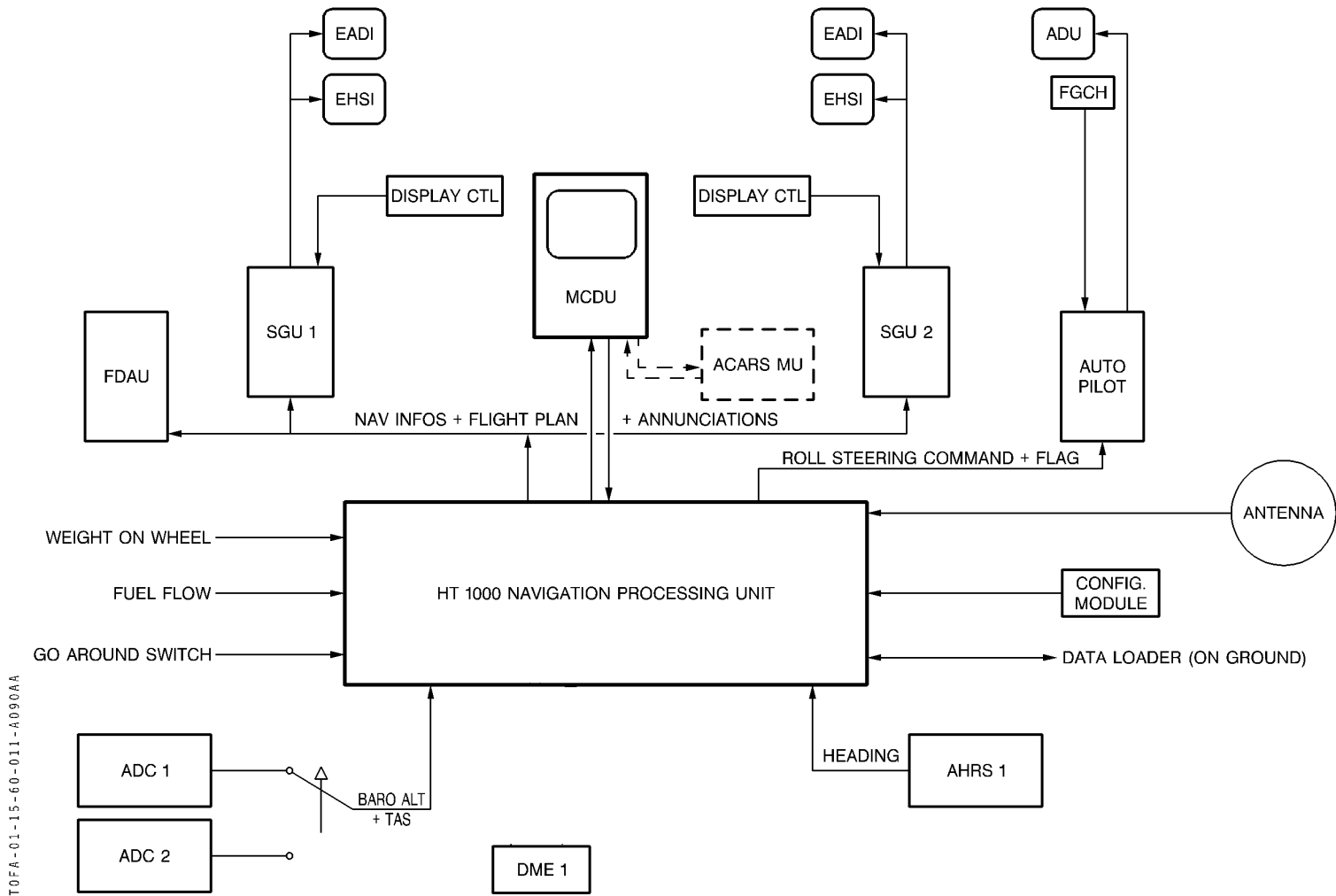


TOFA-01-15-60-011-A080AA

	NAVIGATION SYSTEM		1.15.60		
	GLOBAL NAVIGATION SATELLITE SYSTEM		P 11/12	090	
	GNSS				NOV 01

AA

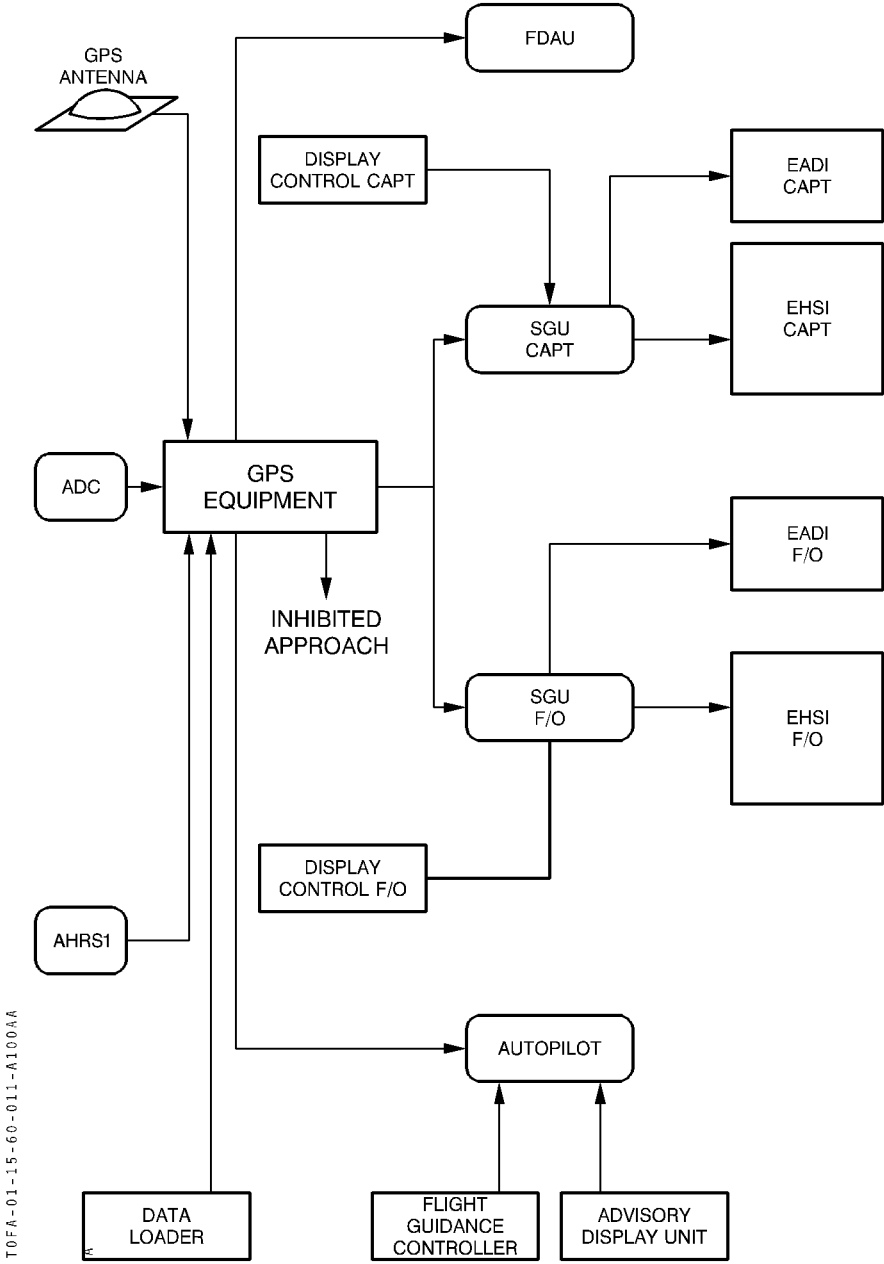
60.4 SCHEMATIC



	NAVIGATION SYSTEM GLOBAL POSITIONING SYSTEM GPS	1.15.60		
		P 11/12	100	
				NOV 00

AA

60.5 SCHEMATIC



T05A-01-15-60-011-A1004A

	NAVIGATION SYSTEM		1.15.60		
	GLOBAL NAVIGATION SATELLITE SYSTEM		P 11/12	110	
	GNSS				NOV 01

AA

60.4 SCHEMATIC

