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## **TUNING**

The FMGC is the basic means for nav aids tuning.

Three modes of tuning are available.

### **AUTOMATIC TUNING**

In normal operation, the FMGC tunes nav aids automatically, with each FMGC controlling its own receiver.

If one FMGC fails, the remaining one controls both sides receivers, after activation of the FM selector switch.

### **MANUAL TUNING**

The crew can use the MCDU to override the FMGCs' automatic selection and tuning of nav aids, and select a specific nav aid for visual display.

This does not affect the automatic function of the FMGC.

An entry on one MCDU is sent to both FMGC in dual mode, or to the remaining FMGC in single mode.

### **BACK UP TUNING**

If both FMGCs fail, the flight crew can use the RMPs (Radio Management Panels 1 and 2) on the pedestal for back up tuning.

The CAPT RMP controls VOR 1 and ADF 1

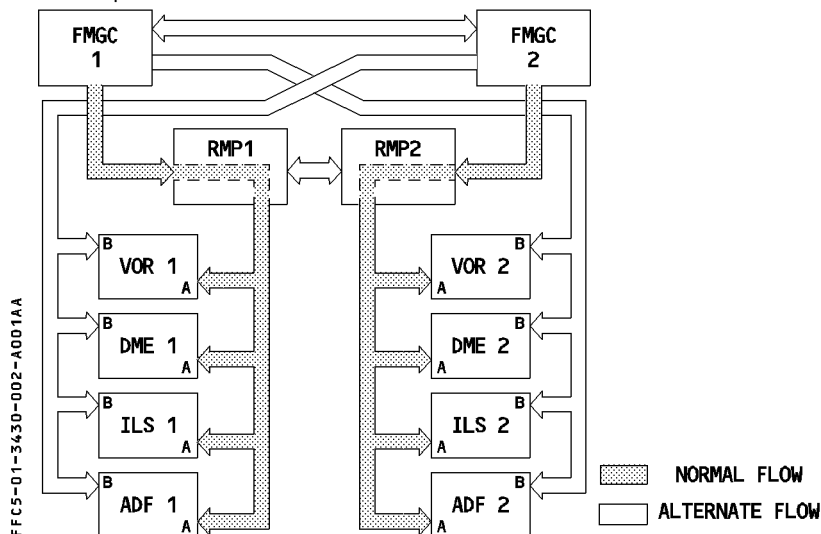
The F/O RMP controls VOR 2 and ADF 2

Each RMP controls both ILSS (provided NAV back up is selected on RMP 1 and RMP 2)

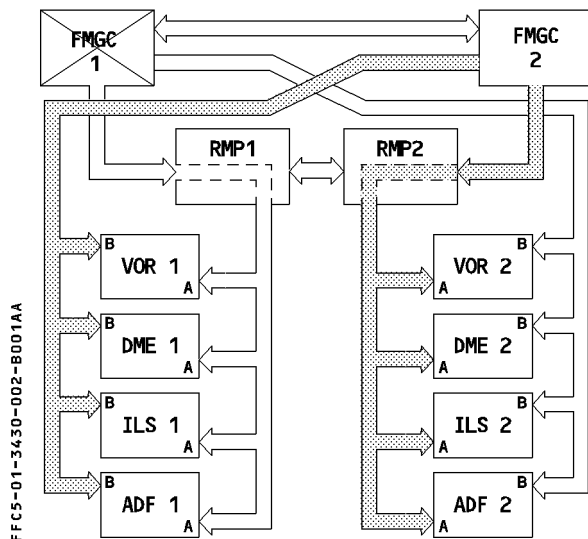
RMP 3 is not used for nav aids tuning.

## ARCHITECTURE

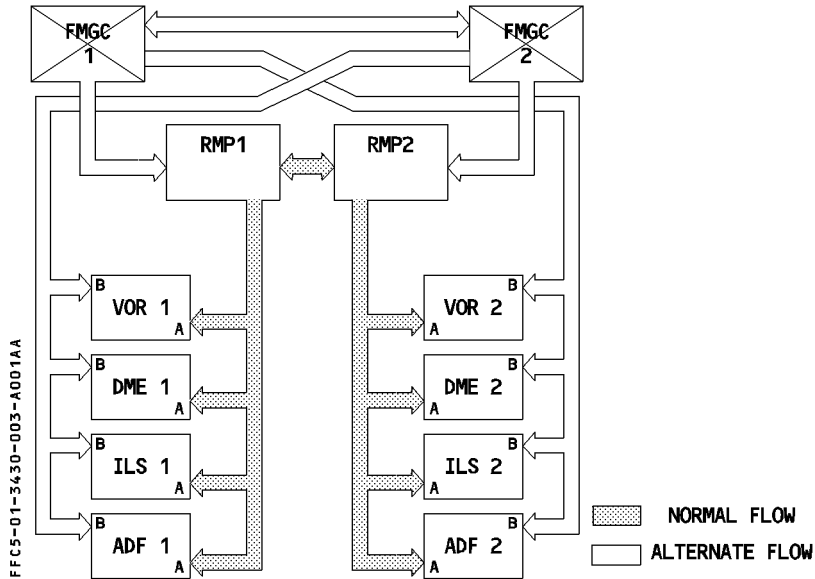
### Normal operation



### FMGC 1 failure



Back up tuning



|                                                                                 |                   |  |         |        |
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## NAVAIDS

### VOR

The aircraft has two VOR receivers.

(For tuning instructions, refer to the “TUNING” paragraph).

- The navigation displays (NDs) show VOR1 and VOR2 information in accordance with the position of the ADF/VOR selectors on the EFIS control panel (See 1.31).
- The DDRMI on the center panel also displays VOR1 and VOR2 bearings if the heading signal is valid, in accordance with the ADF/VOR selector on the DDRMI.

### ILS

The aircraft has two ILS receivers. Each ILS receiver is integrated in a modular avionics unit called MMR (Multi Mode Receiver) (ILS1 receiver in MMR1, ILS2 receiver in MMR2).

(For tuning instructions, refer to the “TUNING” paragraph).

- PFD1 and ND2 display ILS1 information.
- PFD2 and ND1 display ILS2 information.
- The flight crew can put the same ILS information on each PFD by pressing the ILS button on the EFIS control panel. (The green bars come on).
- The NDs display ILS information if the flight crew selects the ROSE ILS mode on the EFIS control panel (See 1.31).

### ADF

The aircraft has two ADF systems.

(For tuning instructions, refer to “TUNING” paragraph).

- The NDs display ADF1 and ADF2 information, depending on the position of the ADF/VOR selectors on the EFIS control panel. (See 1.31).
- The DDRMI also displays ADF1 and ADF2 bearings, depending on the position of the ADF/VOR selector (on the DDRMI).

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## **DME**

The aircraft has two DMEs. The frequency set automatically on the DME corresponds to that set on the VOR or ILS.

Up to 5 ground stations are tuned by the FMGC :

- Channel 1 is used for FMS radio position in VOR/DME mode
- Channel 2 and 3 for FMS radio position in DME/DME mode
- Channel 4 for VOR/DME display
- Channel 5 for VOR/ILS display

The NDs and the DDRMI can display the VOR-DME information .

The ILS-DME information is displayed on NDs, and PFDs when the flight crew has pressed the ILS pushbutton on the EFIS control panel.

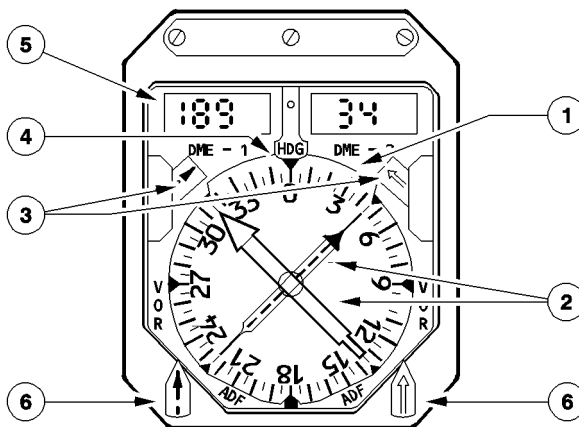
## **MARKER BEACON**

One marker beacon system is included in VOR receiver 1.

The PFD displays the outer, middle and inner marker signals. (Refer to 1.31).

## CONTROLS AND INDICATORS

### DIGITAL DISTANCE AND RADIO MAGNETIC INDICATOR (DDRMI)



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#### ① Compass card

ADIRU 1 normally supplies the signal that positions the compass card ( ADIRU 3 supplies it when selected by the ATT HDG SWITCHING selector).

Display the MAG or TRUE heading as selected by the NORTH REF pushbutton switch.

Above 82.5° north or 60.5° south or in the north magnetic polar region, TRUE heading is automatically selected.

#### ② Bearing pointers

Indicate the magnetic bearing to the station received by VOR 1 or ADF 1 (dashed pointer) and VOR 2 or ADF 2 (double pointer).

#### ③ VOR/ADF 1 (2) flags

The indicators display these flags if :

- the VOR or ADF receiver fails (VOR/ADF selector position indicates the failed receiver), or
- the RMI has an internal failure, or
- the heading signal from ADIRS is not valid, or
- the power supply fails.

Associated with the flag, the relevant pointer moves to the 3 o'clock position.

**Note :** In ELEC EMER configuration only ADF 1 or VOR 1 is available at a time, according to the position of the VOR 1/ADF 1 selector.

④ HDG flag

Appears, associated with VOR/ADF flags display, when :

- the heading signal from the supplying ADIRS is not valid, or
- the RMI has an internal failure, or
- the power supply fails.

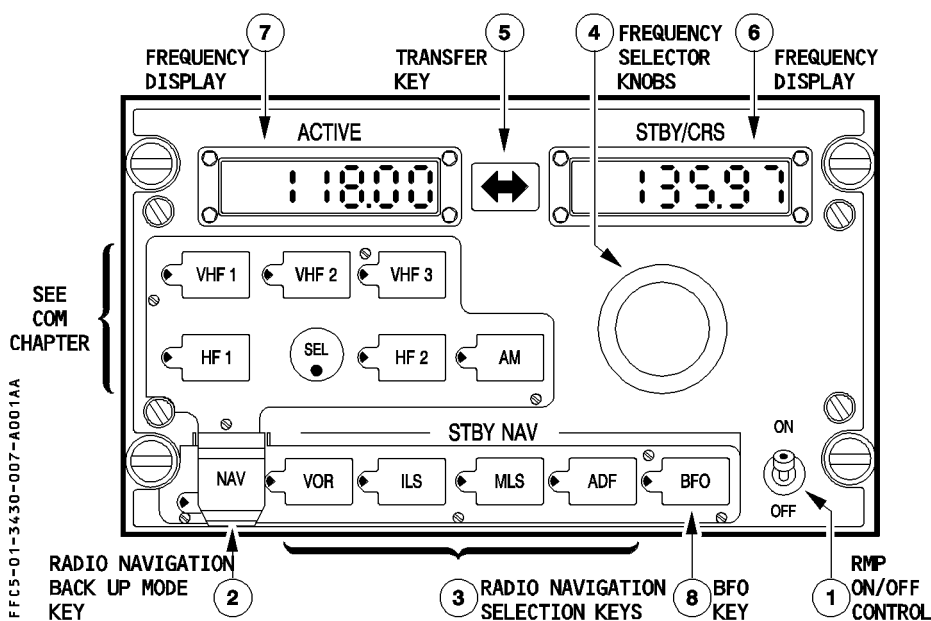
⑤ DME 1 (2) counters

- The counters indicate distances in NM and 1/10 th at less than 20 NM. At less than 1 NM, 0 is shown.

⑥ VOR/ADF selector

- VOR 1 or ADF 1 on single pointer.
- VOR 2 or ADF 2 on double pointer.

**RADIO MANAGEMENT PANEL (RMP)**



① ON/OFF sw

This switch controls the power supply to the panel.

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## ② NAV key (transparent switchguard)

- Pressing this key engages the radio navigation backup mode. It takes control of the VOR, ILS, MLS and ADF receivers away from the FMGC and gives it to the RMP.
- The green monitor light comes on.
- Pressing the NAV key a second time returns control of the navigation radios to the FMGC.

**Note :** – *The flight crew must select this backup tuning mode on both RMP1 and RMP2 if both FMGCs or both MCDUs fail. In the emergency electrical configuration, only RMP1 receives power.*

- *Pressing the NAV key on RMP3 (if installed) has no effect.*
- *In the NAV backup mode, the flight crew can select radio communication systems as it would in the normal mode.*

*Setting one RMP to NAV backup mode removes nav aids tuning from both FMGCs.*

## ③ STBY NAV keys

When the NAV key is on and the flight crew presses one of these STBY NAV keys, the ACTIVE window displays the frequency to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV or COM key goes out.

## ④ Rotating knob

Two concentric knobs allow the flight crew to preselect frequencies for communication radios and stand-by navigation systems and select courses for VOR and ILS.

The desired frequency or course is set in the STBY/CRS window.

- setting frequency :

The outer knob controls the most significant digits, the inner knob controls the least significant digits. A rate multiplier speeds up the tuning when the knob is rotated rapidly.

- setting course :

Selected by inner knob only.

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#### ⑤ Transfer key

The flight crew presses this key to interchange ACTIVE and STBY frequencies. This action tunes the selected receiver to the new ACTIVE frequency.

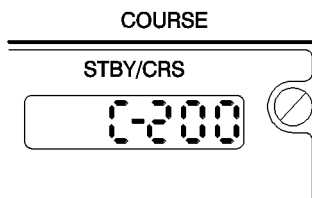
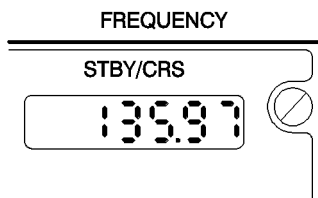
#### ⑥ STBY/CRS window

The flight crew can make the frequency displayed in this window become the active frequency by pressing the transfer key, or change it by rotating the tuning knob.

If this window displays a course, then the ACTIVE window displays the associated frequency.

**Note :** *If the STBY/CRS window is displaying a course, then pressing the transfer key displays the active frequency in both windows.*

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#### ⑦ ACTIVE window

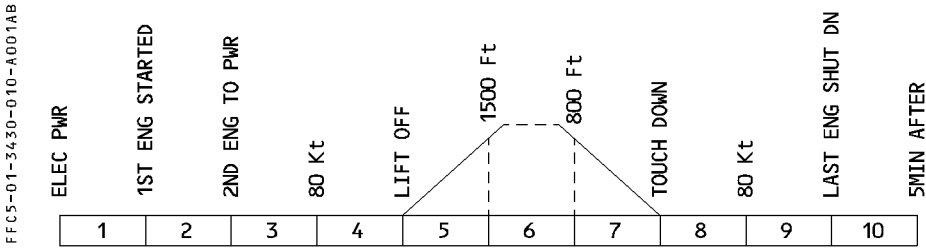
This window displays the frequency of the selected navaid which is identified by a green monitor light on the selection key.

#### ⑧ BFO key

Pressing this key activates the BFO (Beat Frequency Oscillator) if the ADF receiver is selected. The green monitor light comes on.

For most ADFs, with BFO activated, the audio identification is heard. However, there are some ADFs where the BFO must be deactivated, in order to hear the audio identification.

WARNINGS AND CAUTIONS



| EWD : FAILURE TITLE<br>conditions | AURAL<br>WARNING | MASTER<br>LIGHT | SD<br>PAGE<br>CALLED | LOCAL<br>WARNINGS              | FLT<br>PHASE<br>INHIB |
|-----------------------------------|------------------|-----------------|----------------------|--------------------------------|-----------------------|
| ILS 1 (2)(1+2) FAULT              | SINGLE<br>CHIME  | MASTER<br>CAUT  | NIL                  | Flag<br>on<br>PFD<br>and<br>ND | 3, 4, 5               |