

FAME Systems – IFR-Panel

Version 1.0



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FAME SYSTEMS

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1. Introduction

FAME IFR-Panel is designed to display Cockpit instruments in a flight simulator in an easy and flexible manner. It is a part of the FAME Flight Simulator System, but can also be used with the MS Flight simulator (FS 2004, FSX) with reduced functionality.

The goal is the realistic instrument display of the simulated airplane for the purpose of training of instrument procedures during IFR-Training. During the development process great importance was attached to achieve a very close approximation to reality and to graphic design.



Fig. 1: Example: Main Flight Instruments (Pilot Side)

To display the instruments the program does not use the preinstalled instruments of the flight model, but shows own gauges delivered from the simulation. The program can run on an additional PC, which will reduce the work load of the simulation PC. The program can run in various instances on one PC or in a network.

With the interface hardware module **FAME IFS** it is possible to connect controls for the virtual instrument. This way setting like heading, QNH, DA, OBS, cabin altitude, instrument lighting can be set directly at the instruments (see description of gauges).

FAME IFS makes the connection of indicators and controls (e.g. **FAME Gear C421**, **FAME Flaps C421** etc.) possible.

Furthermore the **FAME Sidepanel C421**, **FAME Fuses C421**, **FAME Emergency C421** can be connected via the **FAME IFS** with the simulator.

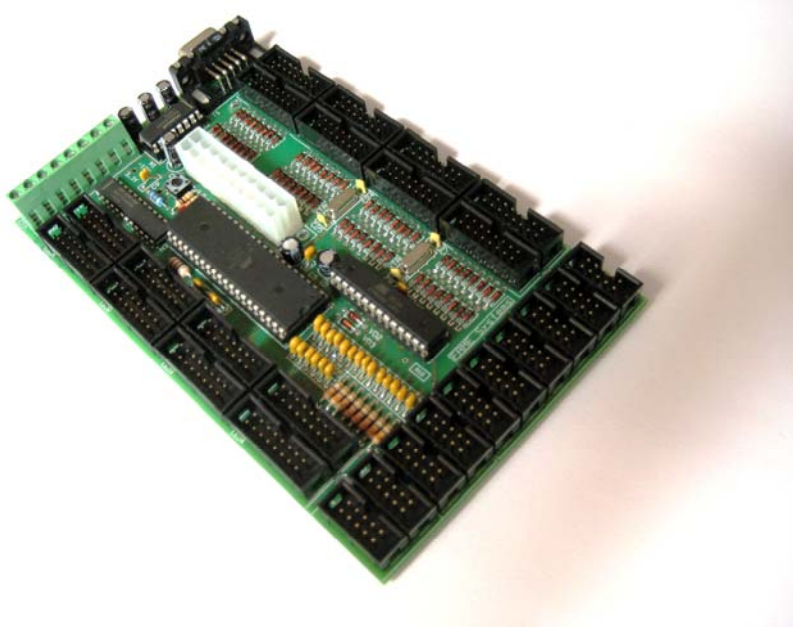


Fig. 2: FAME IFS Controller



Fig. 3: FAME NAV-Rack NR 208

In addition the **FAME NAV-Rack NR 208** can be connected to the **FAME IFS**. The **FAME NAV-Rack NR 208** simulates a radio stack used in General Aviation with 1-2 COM/NAV-Stations, 1-2 ADF Receivers, 1-2 DME, 1-2 Transponders, 1 Audio panel and 1 Autopilot.

The **FAME NR 208** governs the corresponding sections in the simulation process and communicates with the **FAME IFR-Panel**.

In connection with the FAME Instructor-Station additional functions for the FAME IFR-Panel can be used:

- Simulation of instrument failures (Partial-Panel-Flying: „flagged“ and „silent“)
- Simulation of system failures (Vacuum, Electric, Static/Dynamic, Hydraulic, Fuel)
- Dynamic control of the Audio-Advisory-System

2. Installation

Please run setup.exe to perform all necessary installation steps. After the installation the program is ready to run as Panel.exe. The program is setup by default to C:\Panel.

The following software components (by Peter Dowson) have to be installed to run the Instructor.exe:

- FSUIPC
- WideFS

3. Usage

3.1 Access: Panel <panel-File>.pnl

If the program is started without choosing a .pnl-file the last used .pnl-file will be opened.

.PNL-files contain a description of the position, orientation and scale of all panel gauges. Hence a full panel is described.

The panel will be empty at the first start of the program. Files can be loaded by following the menu "File" (Datei) – function "Open" (Öffnen), see also chapter 3.2.

Because the FAME IFR-Panel is a "Full-Screen-Application" the menu will only be shown, if the mouse pointer is moved to the upper left corner, where the menu is located. After moving the mouse pointer somewhere else the menu will hide again and the full screen can be used for the panel design.



Fig. 4: File-Menu

3.2 Menu: File (Datei)

The following functions can be found in the File Menu:

New (Neu): Closes the active panel and opens a new blank panel.

If changes were made to the active panel the user will be asked, whether to save the changes or not.

Open (Öffnen): Closes the active panel and opens the chosen panel.

If changes were made to the active panel the user will be asked, whether to save the changes or not.

Save (Speichern): Saves the active panel.

Panel will still be displayed.

Save as (Speichern unter): Saves the active panel with a new file-name.

Panel will still be displayed.

1...4: File-names of the last four used files.

These files can be loaded by clicking on one of them.

Close (Beenden): Closes the active panel and exits the program.

If changes were made to the active panel the user will be asked, whether to save the changes or not.

Using the functions „Open“ (Öffnen) or „Save as“ (Speichern unter) the following dialogs will be shown:

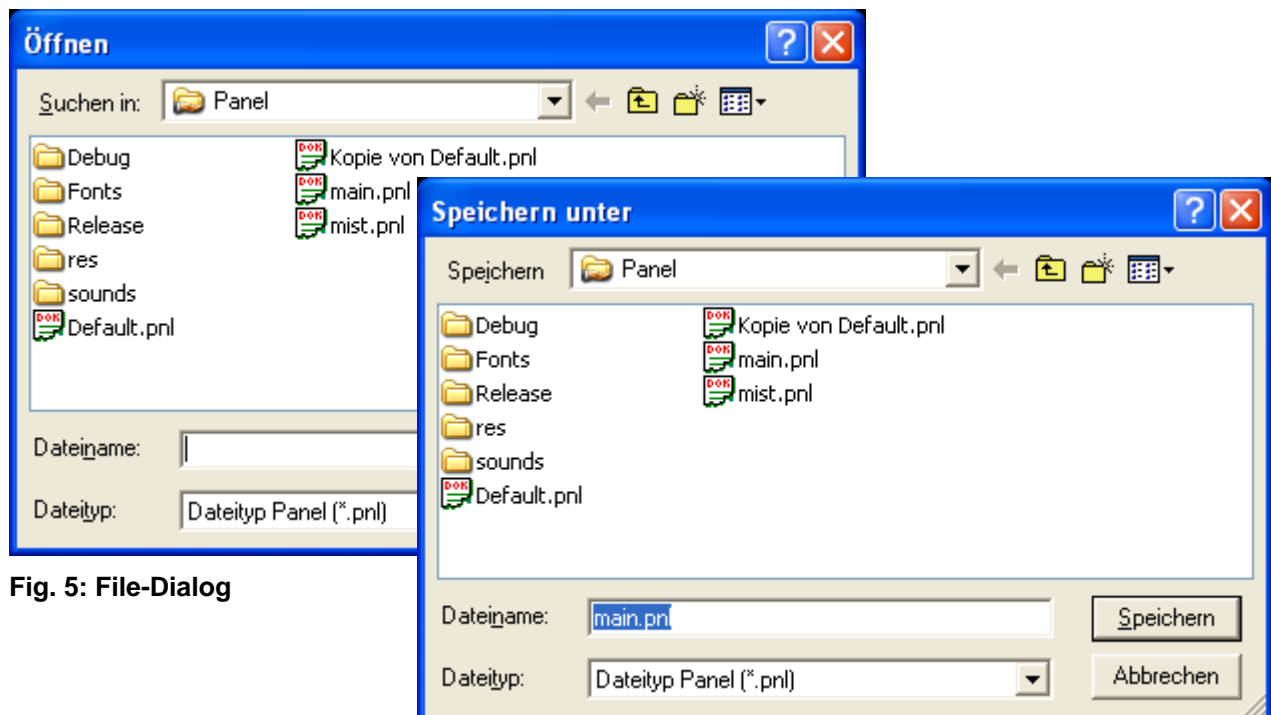


Fig. 5: File-Dialog

3.3 Menu: Edit (Bearbeiten)

To edit a panel the following functions can be used:

3.3.1 Insert a new Instrument

If the function „New Instrument“ (neues Instrument) is chosen,



Fig. 6: Menu Edit (Bearbeiten)

the airplane type and instrument can be chosen from the following dialog („New Gauge“):

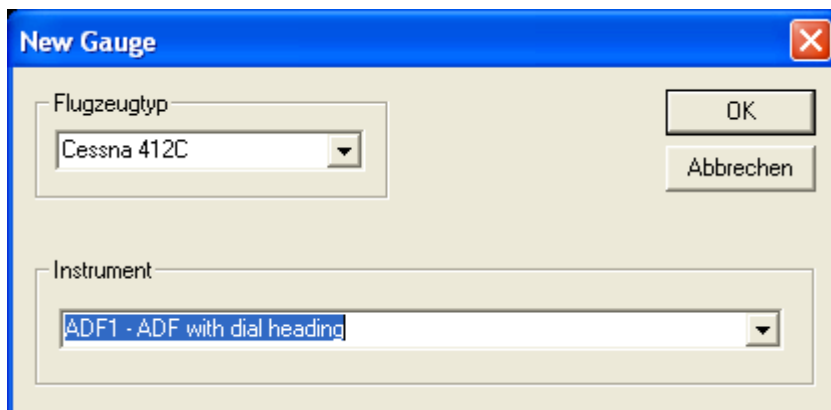


Fig. 7: New Gauge Dialog

Depending on the airplane type the new instrument can be chosen from the Dropdown Box. To acknowledge the OK-Button has to be pushed and the new instrument will be displayed in the lower left corner. The standard scale factor is 2.0 in X and Y-direction (see Fig. 8).

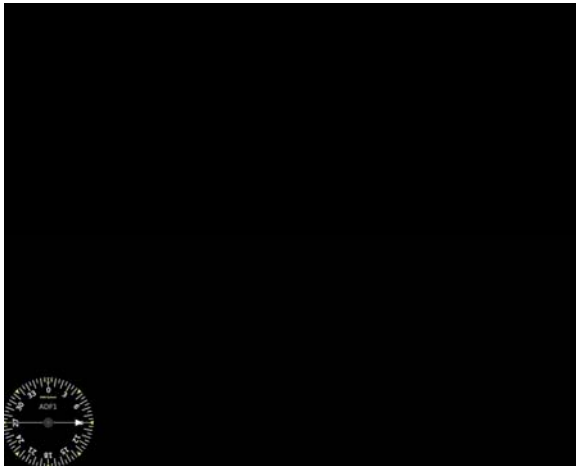


Fig. 8: Default Position New Gauge

3.3.2 Change the Panel Locking (Fixieren)

If an existing panel is loaded the file cannot be changed, the data of the panel is locked. If changes to the panel shall be made the panel locking must be canceled: Menu "Edit" (Bearbeiten) function "lock" (Fixieren).

In case the panel is locked the word "lock" (Fixieren) is checkmarked otherwise it is not checkmarked.



Fig. 9: Menu Panel Locking (Fixieren)

By clicking on the word „lock“ the panel locking can be turned on or off. The panel locking is turned off by default, if a new blank panel (Menu: "File" (Datei) → "New" (Neu)) is opened or a new instrument is insert. If the panel locking is turned off, the function "Select all" (Alle auswählen) can be used.

3.3.3 Choosing an Instrument for changing

If the panel locking is turned off, an instrument can be selected by point and click with the left mouse button. The selected instrument is marked by a white border (see Fig. 10).



Fig. 10: Selection of one instrument

To select more than one instrument the CTRL-Key has to be hold while pointing and clicking with the left mouse button on the required instruments (see Fig. 11).

Without holding the CTRL -Key only the last instrument will be selected – only one.



Fig. 11: Selection of more than one instrument

With the function „Select all“ (Alle auswählen) all instruments displayed on the panel can be selected (see Fig. 12).

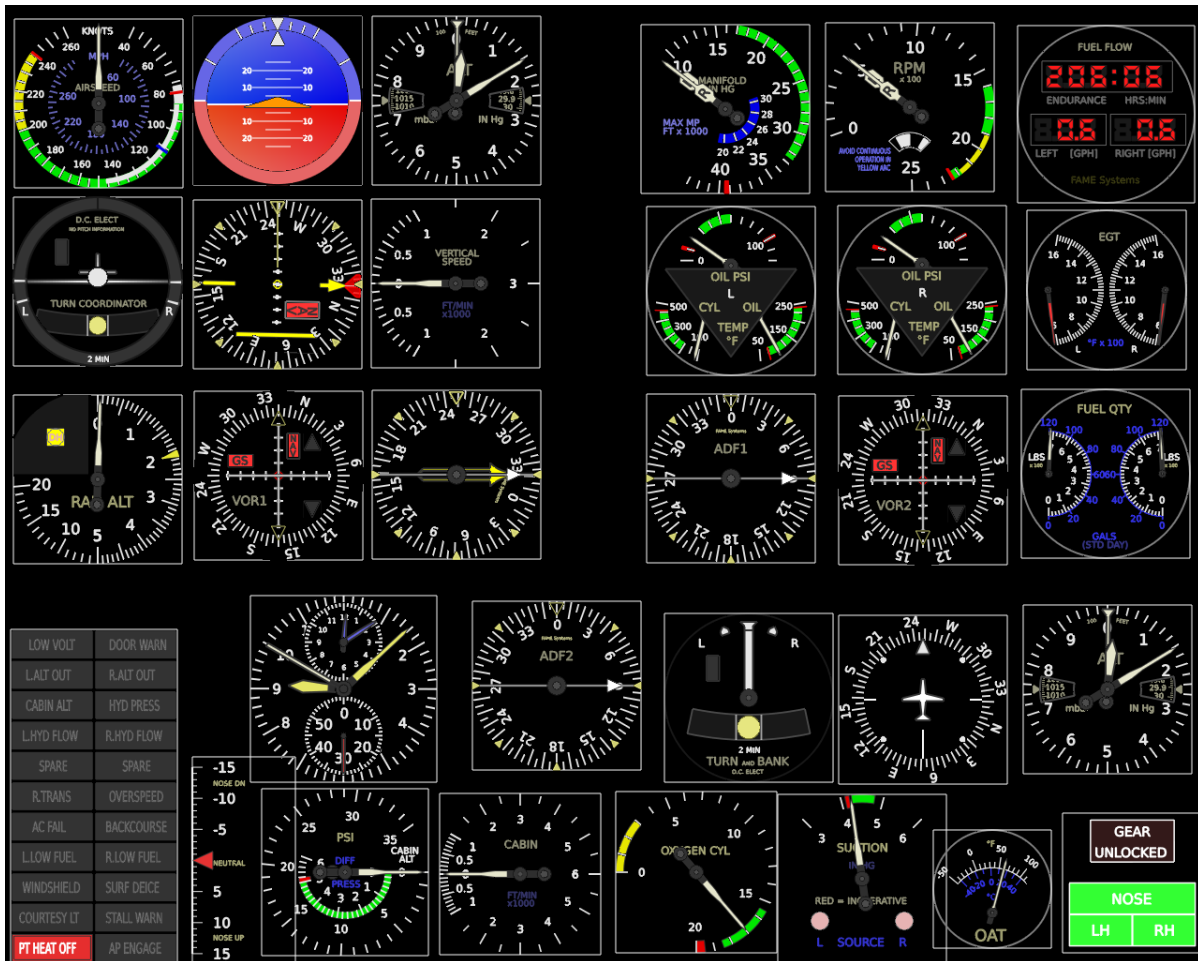


Fig. 12: Selection of all instruments

3.3.4 Moving Panel Instruments

One or more selected instruments can be moved by holding the left mouse button down. After releasing the left mouse button the instruments are placed at the new position.

3.3.5 Editing Panel Instruments

The scale of one or more selected instruments can be changed with the „+“ and „-“ keys.

- + : Scale factor is changed by + 0.01
- - : Scale factor is changed by - 0.01
- The key „Del“ deletes the selected instruments!

By using the right mouse button to click on an instrument the instrument can be selected as well, but only one at a time. At the same time a context menu is displayed next to the mouse pointer.



Fig. 13: Context menu after using the right mouse button

By choosing the function “Edit” of the context menu the dialog shown in Fig. 14 is displayed. The parameters have the following meanings:

Size X: X-Size of the enclosing square of the instruments in pixel

Size Y: Y- Size of the enclosing square of the instruments in pixel

Position X: X-Position of the upper left corner of the enclosing square of the instruments in pixel

Position Y: Y- Position of the upper left corner of the enclosing square of the instruments in pixel

Scale X: X-Scale factor of the enclosing square of the instruments

Scale Y: Y- Scale factor of the enclosing square of the instruments

Push the „OK“ button to accept the changes. The instrument will be displayed at the new position with the new size.

„Cancel“ (Abbrechen) does cancel the changes and the instrument is not changed.

“Delete” of the context menu will delete the instrument from the panel.



Fig. 14: Gauge Parameter SPEED context menu

4. Special Functions

4.1 Changing the Brightness of Instruments

With the hardware **FAME IFS** connected displays and controls (e.g. **FAME NAV-Rack NR 208** or **FAME Sidepanel**) can be dimmed. The brightness of the instruments can be adjusted to the surrounding. During simulated night flights the virtual instruments have to be adjustable as well. That's why the **FAME IFR-Panel** is also dimmable.

According to the simulated time (sun position) and visibility (clouds, rain) the panel brightness will be selected automatically. If the readability decreases due to less simulated sun light the virtual instrument illumination / lightning (red-light) can be turned on and dim the light via the dimmer switch of the **FAME IFS**.



Fig. 15: Different Red-light brightness of the night mode

4.2 Instrument Failures

Instrument failures can be simulated with the FAME Instructor-Station. Each single instrument can have a malfunction. Two kinds of failures are possible:

- „Flagged-Failures“ – the instrument indicates the failure with flags (see Fig. 16)
- „Silent Failures“ – the instrument does not indicate the failure, it just stops its normal behaviour (see Fig. 17)

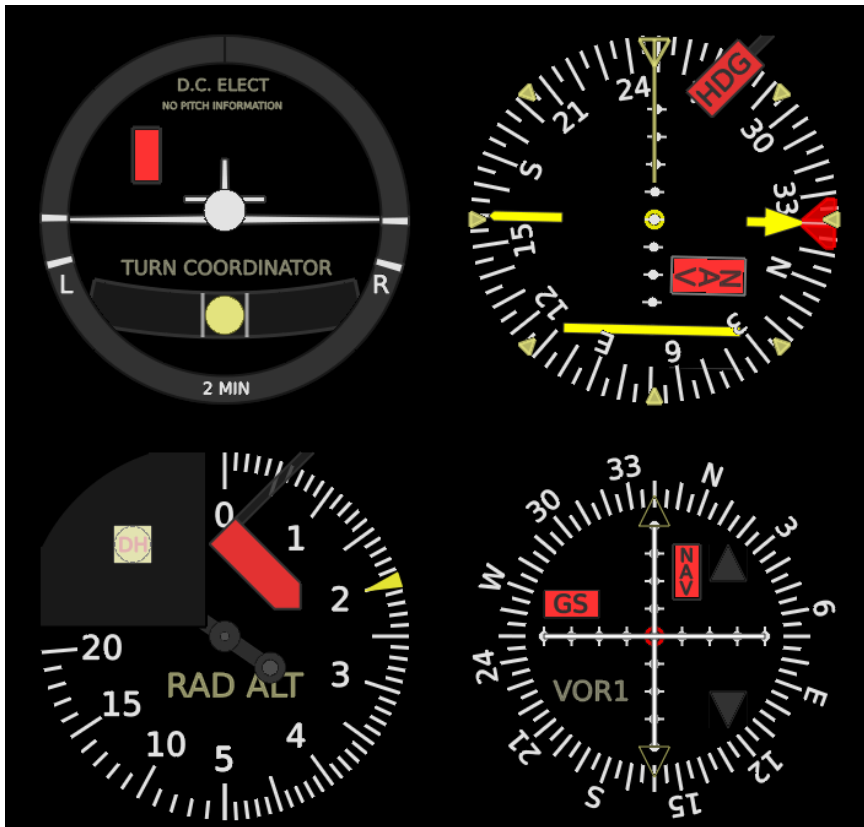


Fig. 16: Flagged Failures

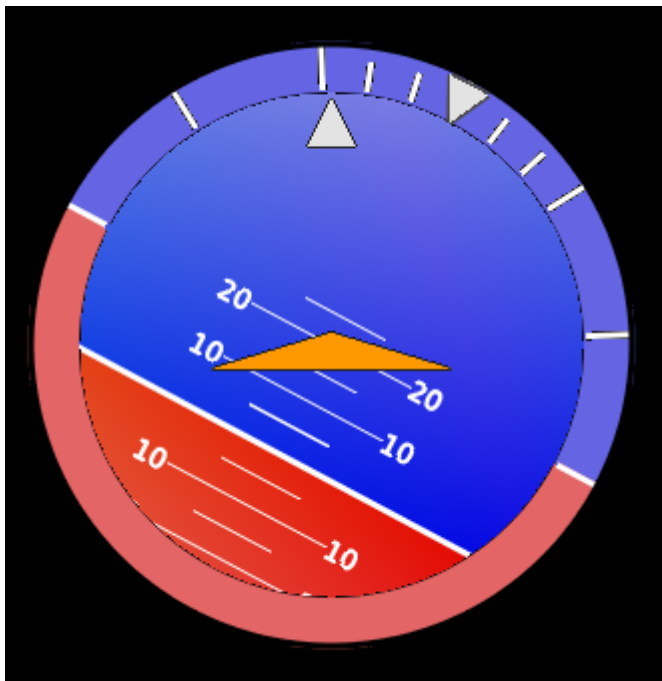


Fig. 17: Silent Failures

4.3 Audio Advisory System

FAME IFR-Panel can generate acoustic advices for typical IFR states.

They are:

- Failure of systems
- Reaching the Decision Altitude (DA)
- Extension and retraction of the gear
- Extension and retraction of the flaps
- Reaching specific speeds (V1, V2)
- Altitude above ground
- Occurrence of critical flight attitude
- Work through the checklists

These acoustic advices are configurable during the flight with the **FAME Instructor-Station**.

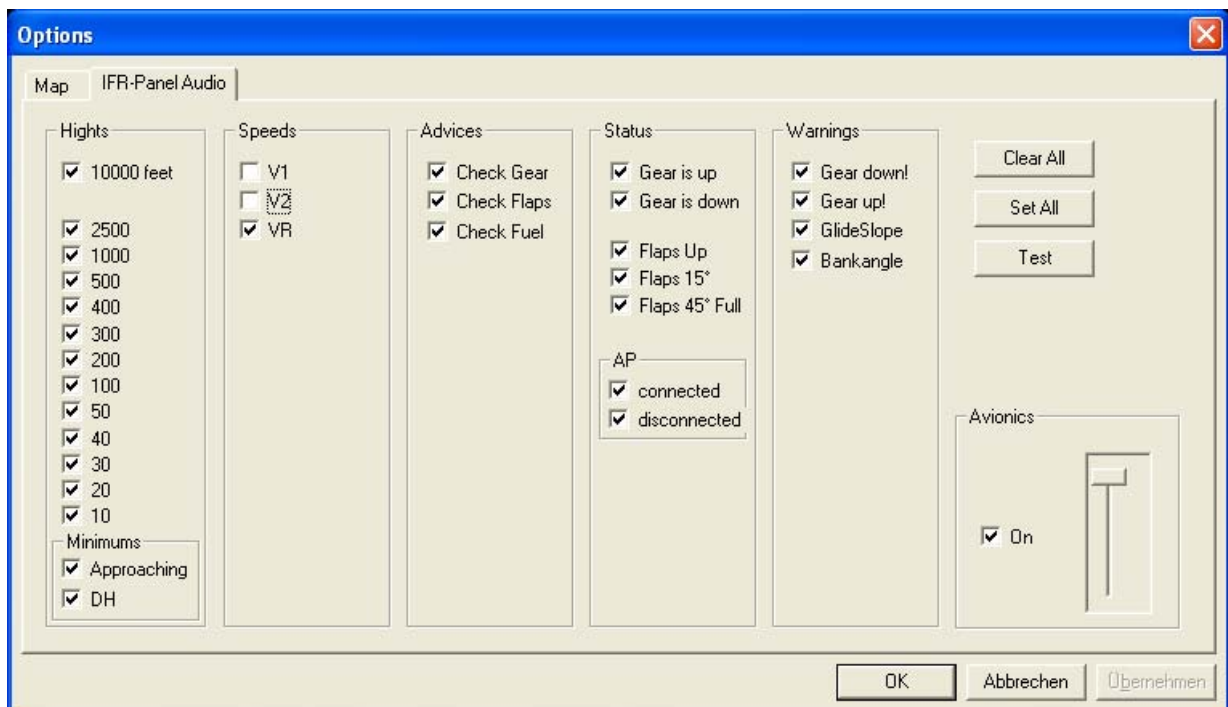


Fig. 18: IFR-Panel Audio Options

Specifications of Panel-sets

4.4 Cessna 421 „Golden Eagle“

4.4.1 ADF 1



Name: ADF1
 Description: ADF with dial heading

Def. Size X: 100 pixel
 Def. Size Y: 100 pixel

Adjustability : ADF1-Frequency
 Dial Heading
 Brightness

4.4.2 ADF2



Name: ADF2
 Description: ADF with dial heading

Def. Size X: 100 pixel
 Def. Size Y: 100 pixel

Adjustability : ADF2-Frequency
 Brightness

4.4.3 Altimeter



Name: ALTIMETER
 Description: ALTIMETER pilot side

 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel

 Adjustability : QNH
 Brightness

4.4.4 Altimeter Standby (Copilot Side)



Name: ALTIMETER_STBY
 Description: ALTIMETER copilot side (STBY)

 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel

 Adjustability : QNH
 Brightness

4.4.5 Annunciator

LOW VOLT	DOOR WARN
L.ALT OUT	R.ALT OUT
CABIN ALT	HYD PRESS
L.HYD FLOW	R.HYD FLOW
SPARE	SPARE
R.TRANS	OVERSPEED
AC FAIL	BACKCOURSE
L.LOW FUEL	R.LOW FUEL
WINDSHIELD	SURF DEICE
COURTESY LT	STALL WARN
PT HEAT OFF	AP ENGAGE

Name: ANNUNCIATOR
 Description: Main annunciator panel
 Def. Size X: 100 pixel
 Def. Size Y: 200 pixel
 Adjustability : Brightness

4.4.6 Cabin Altitude



Name: CABINALTITUDE
 Description: Cabin altitude & diff pressure
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Cabin Altitude
 Brightness

4.4.7 Cabin Rate



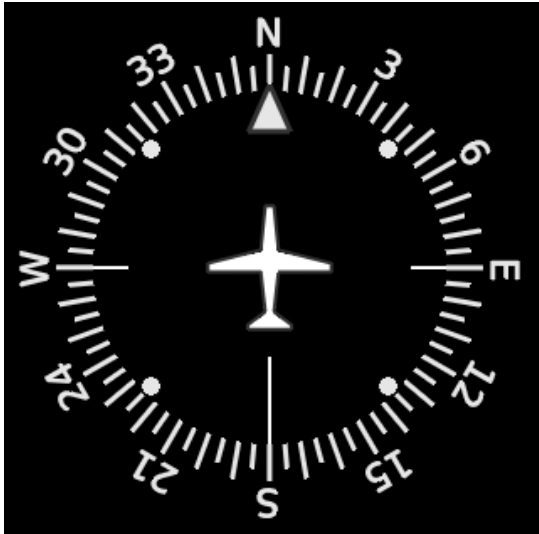
Name: CABINRATE
 Description: cabin pressure rate
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.8 Clock



Name: CLOCK
 Description: a nice clock
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Simulation time
 Stop watch
 Brightness

4.4.9 Directional Gyro DG (not slaved)



Name: DG
 Description: directional gyro NOT slaved
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Heading
 Brightness

4.4.10 EGT



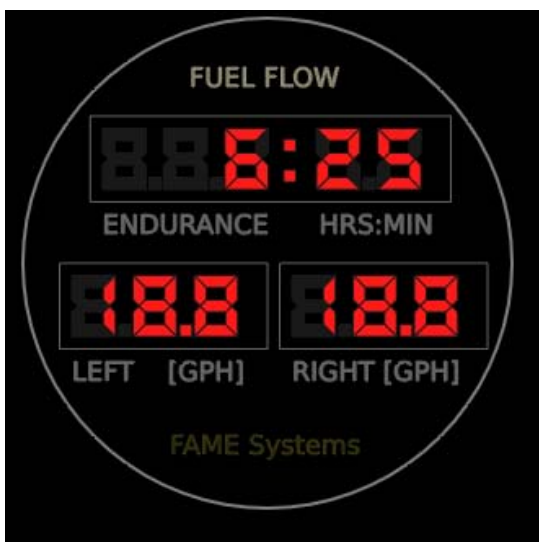
Name: EGT
 Description: dual EGT gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.11 FUEL



Name: FUEL
 Description: dual fuel gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.12 FUELFLOW



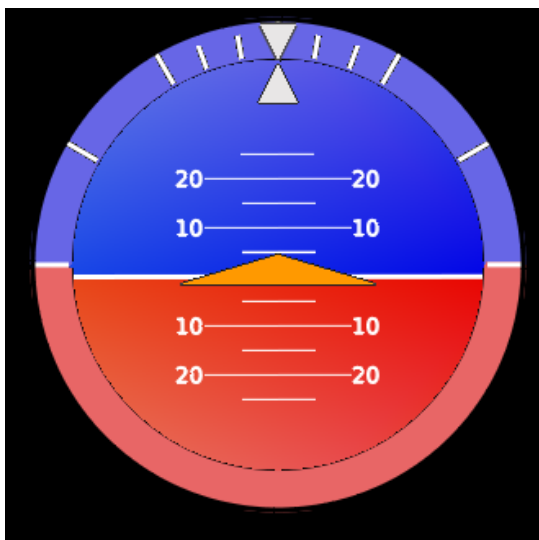
Name: FUELFLOW
 Description: digital fuel flow & endurance gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.13 GEAR



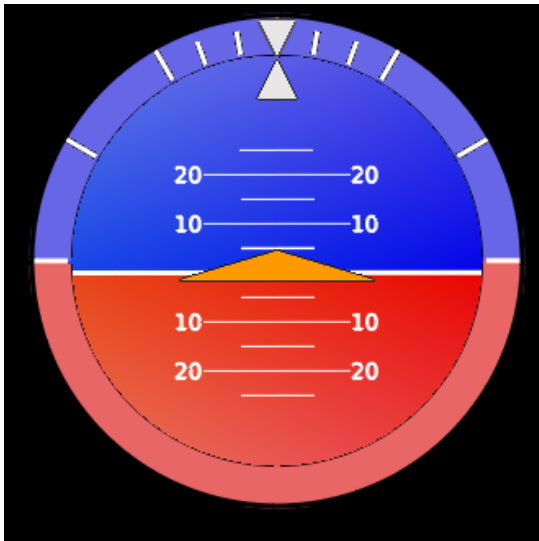
Name: GEAR
 Description: gear lights
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.14 HORIZON 1



Name: HORIZON1
 Description: horizon with flight director
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Attitude-Indicator
 Flight Director (FD)
 Brightness

4.4.15 HORIZON 2



Name: HORIZON2
 Description: horizon without flight director
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Attitude-Indicator
 Brightness

4.4.16 HSI



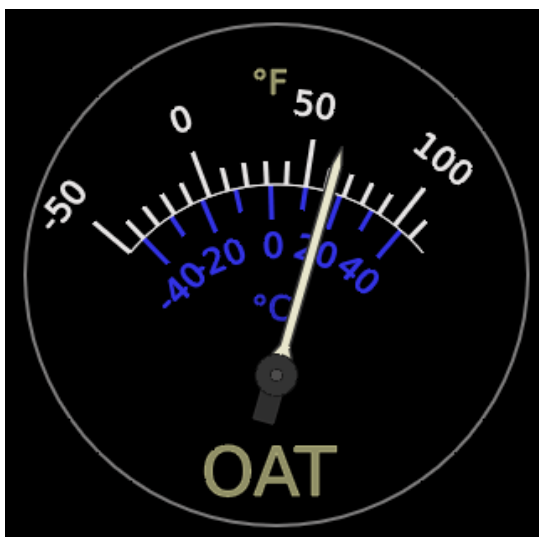
Name: HSI
 Description: standard HSI
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Heading
 OBS
 Brightness
 Flags: Heading
 NAV
 GS

4.4.17 MANIFOLD



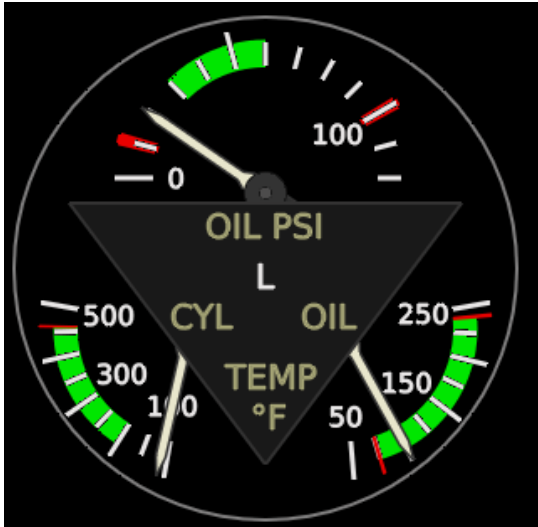
Name: MANIFOLD
 Description: dual manifold gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.18 OAT



Name: OAT
 Description: outside air temperature
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.19 OIL 1

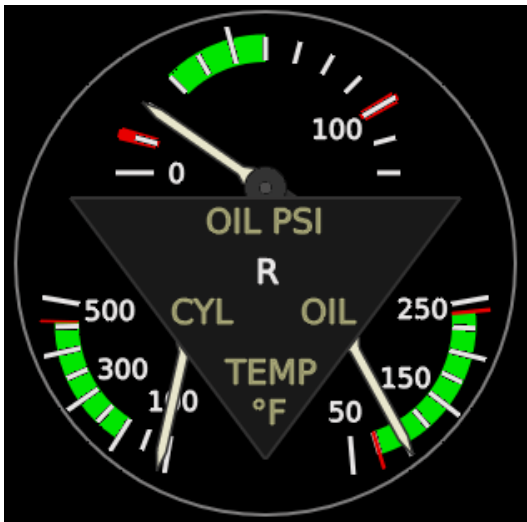


Name: OIL1
 Description: combined oil and cylinder temperature & oil pressure gauge (Left Engine)

Def. Size X: 100 pixel
 Def. Size Y: 100 pixel

Adjustability : Brightness

4.4.20 OIL 2



Name: OIL2
 Description: combined oil and cylinder temperature & oil pressure gauge (Right Engine)

Def. Size X: 100 pixel
 Def. Size Y: 100 pixel

Adjustability : Brightness

4.4.21 OXYGEN



Name: OXYGEN
 Description: oxygen cylinder pressure
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.22 RADIOALT



Name: RADIOALT
 Description: radio altimeter with decision altitude
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : DA
 Brightness
 Flags: InOP
 DA

4.4.23 RMI



Name: RMI
 Description: RMI gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : ADF Frequency
 VOR Frequency
 Brightness

4.4.24 RPM



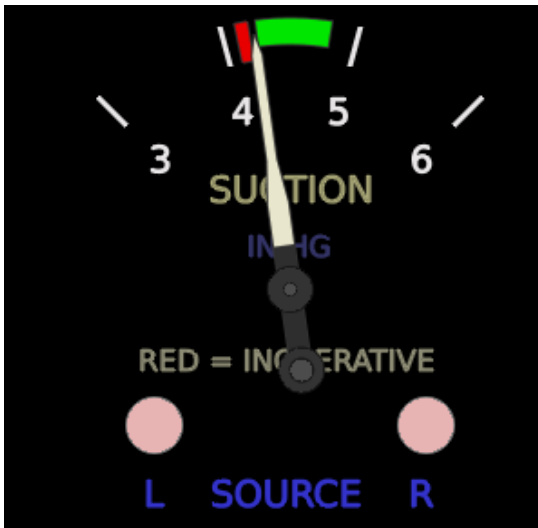
Name: RPM
 Description: dual RPM gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.25 SPEED



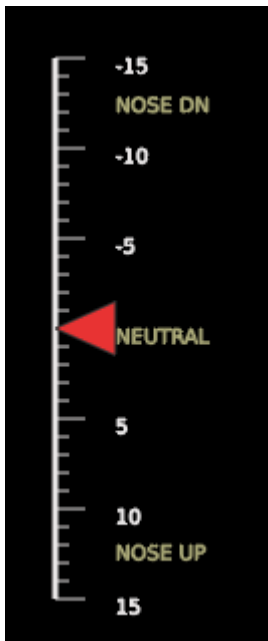
Name: SPEED
 Description: indicated airspeed
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.26 SUCTION



Name: SUCTION
 Description: vacuum suction
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness
 Flags: Source inoperative

4.4.27 TRIMTAB



Name: TRIMTAB
 Description: elevator trim tab

Def. Size X: 50 pixel
 Def. Size Y: 100 pixel

Adjustability : Brightness

Flags: Electric InOP

4.4.28 TURN



Name: TURN
 Description: turn coordinator (needle)

Def. Size X: 100 pixel
 Def. Size Y: 100 pixel

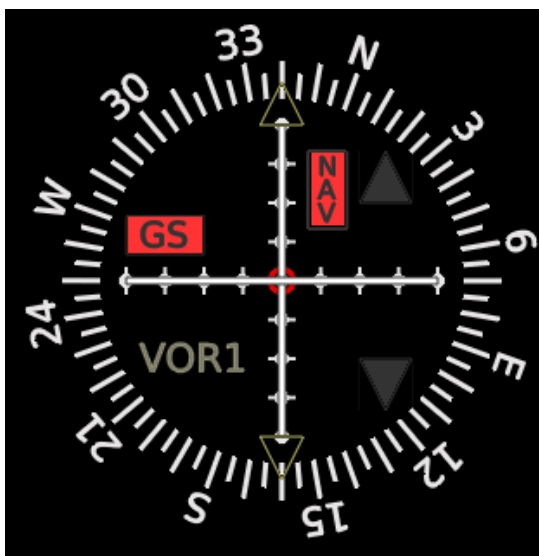
Adjustability : Brightness

4.4.29 TURN 1



Name: TURN1
 Description: turn coordinator (airplane)
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness
 Flags: Electric InOP

4.4.30 VOR 1



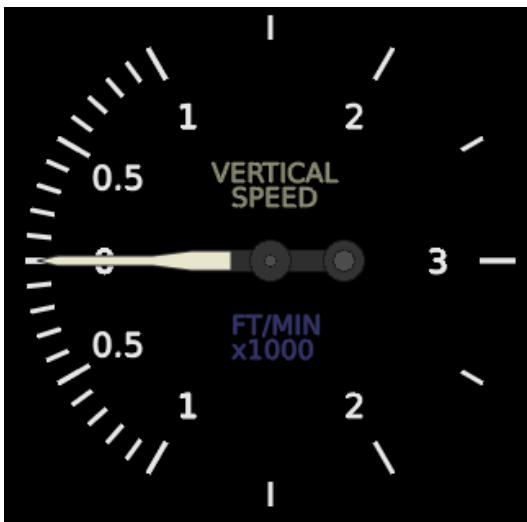
Name: VOR1
 Description: VOR1 gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : OBS
 Brightness
 Flags: NAV
 GS

4.4.31 VOR 2



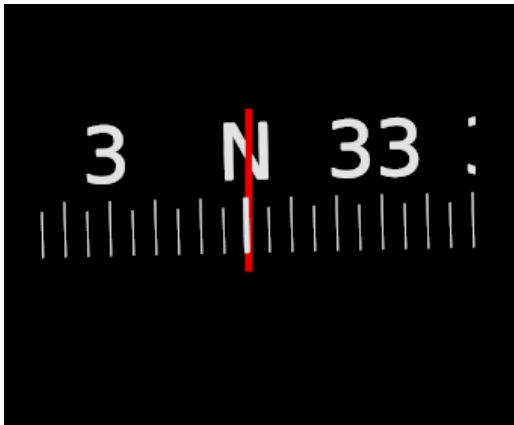
Name: VOR2
 Description: VOR2 gauge
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : OBS
 Brightness
 Flags: NAV
 GS

4.4.32 VSI 1



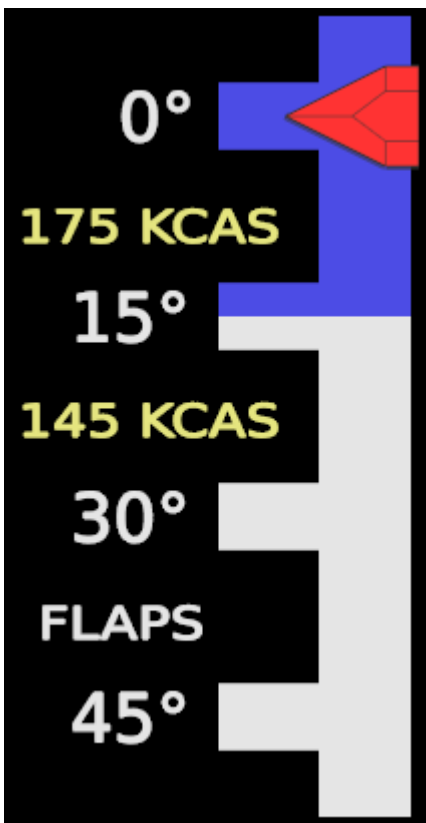
Name: VSI1
 Description: vertical speed
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.33 Compass



Name: Compass
 Description: whiskey compass
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness

4.4.34 FLAPS EXTEND INDICATOR



Name: Flaps
 Description: flaps extend indicator
 Def. Size X: 100 pixel
 Def. Size Y: 100 pixel
 Adjustability : Brightness