FLIGHTLAB FCMConsole Tutorial

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1 Introduction

The **FCMConsole** is a graphical interface for running **fcm** dynamic models. It runs the models only; **PilotStation** must be started separately from the command line. To start the interface, type **fcmconsole &** at the command line prompt. This will bring up the graphical interface window for the **FCMConsole**.

2 Options

By default, the graphical interface starts in the **Options** section of the interface. Once the interface window appears, the desired **fcm** model and configuration files need to be selected. To do this, click on the "..." button to the right of either the **Model** or **Config** fields. A new window will appear that will allow the user to browse through the directory structure to find the desired model or configuration file. Highlight the desired file by clicking it and then click the "Open" button.

Once the appropriate files have been selected, there are five options that the user may select from:

- **Verbose?** Selecting this option will generate more detailed messages in the log screen when the "Start" button is pressed.
- **Enable PWS?** Selecting this option will enable the model to communicate with PilotStation.
- **Enable network?** Selecting this option will enable the model to utilize **netflc** for data communication over a local area network.
- **Use control box?** Selecting this option will allow the user to fly the model using the control box.
- **Use joystick?** Selecting this option will allow the user to fly the model using a joystick.

Once the desired options have been selected, click the "Start" button to launch the model. As soon as the button is pressed, the interface will switch to the **Log** area and a series of messages will be displayed. Any error messages will be shown in red. Note that the **Config** and **Monitor** sections of the interface are now accessible.

3 Log

The log screen displays status messages when the simulation is started using the "Start" button in the **Options** screen as well as when the model is stopped by pressing the "Stop" button.

4   Diagnostics

The **Diagnostics** screen can be utilized to debug the model.

5   Configuration

It is possible to configure some initial conditions for the simulation. To do this, click on the **Config** tab in the interface screen. This will bring up the configuration screen, which consists of three parts:

- Aircraft
  - X Inertial position
  - Y Inertial position
  - Z Inertial position
  - Heading
  - Airspeed
  - Gross weight
- Environment
  - Wind magnitude
  - Wind azimuth
  - Sea level pressure
  - Sea level temperature (degF)
- Ship
  - Ship X
  - Ship Y
  - Ship Z
  - Ship speed
  - Roll amplitude
  - Pitch amplitude
  - Heave amplitude

For **fcm** models with no ship modeled, all the configuration entries will be zero. Once the configuration has been set as desired, press the "Apply" button at the bottom of the screen to apply the settings to the simulation. The model can then be trimmed, if desired, by pressing the "Trim" button.

6   Monitor

A real time monitor has been implemented in the **FCMConsole** interface. It can be configured to display in real time any variable contained within a FLIGHTLAB

CPG group. Note that it is not necessary to use the monitor in order to run the model. To access the monitor, click on the **Monitor** tab in the interface screen. By default, there are no variables in the monitor when it is first opened. A blank screen is displayed with two buttons labeled with a right facing triangle followed by three dots, one in the top right hand corner and one in the bottom left hand corner. The top button enables the user to add multiple panes to the monitor as well as to add variables to each screen. The bottom button is for adding switch monitors, which appear as buttons along the bottom of the monitor screen. To add a pane or to add/delete variables to/from an existing pane, click on the top button. This will open a new window labeled "Configure slider..." At the top of this window is a field labeled "Pane." This field tells the user which pane they are configuring. To the right of this field is a button labeled "New." This allows the user to add a new pane to the monitor. Below the "Pane" field is another field labeled "Find." This allows the user to search in the variable list for a specific variable. Below this is a window containing a list of all the variables available for the real time monitor. To the right are two buttons: "Add" and "Delete." To the right of these buttons is another window which contains all the variables that have been added to the monitor. By default, this window is empty. To add a variable to this window, click on the desired variable in the left hand window and click the "Add" button. A variable can be removed from the monitor list by clicking it in the right hand window and clicking "Delete." Below these two windows are four data entry boxes:

- **Field:** The name of the currently selected variable is listed in this box.
- **Min:** The user may specify the desired minimum value for the selected variable to be displayed in the real time monitor.
- **Max:** The user may specify the desired maximum value for the selected variable to be displayed in the real time monitor.
- **Current:** This box displays the current value of the selected variable.

When the real time monitor has been configured as desired, click the "Apply" button. This will close the "Configure slider..." window and apply the changes to the real time monitor screen in the **FCMConsole** interface.

The switch configuration screen works in much the same way, except that there are no panes to deal with and variables are only available from FLIGHTLAB CON-FIGPAR groups. At the top of the screen is a "Find" field that works the same way as for the pane configuration. Below that are the same two windows separated by the "Add" and "Delete" buttons. Below this are two fields, rather than four.

- **Field:** The name of the currently selected variable is listed in this box.
- **Label:** The user can specify a label for the switch button. The default setting is the variable name.

When the switches have been configured as desired, click the "Apply" button. This will close the "Switch configuration..." window and apply the changes to the real

time monitor screen in the **FCMConsole** interface. When the switch is off, the respective button will be a gray color. When the switch is turned on, it will change to green. A red color indicates that the specified variable could not be found in the **fcm** model.

7 Running the Model

To run the model and begin flying, click the "Run" button. To pause or reset the model to the last trim point, click the "Pause" or "Reset" buttons, respectively.