

# LINDA

## Your controls!

LUA INTEGRATED NON-COMPLEX DEVICE ASSIGNING

**MANUAL v1.01**

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# INTRODUCTION

If you have ever bought a complex add-on aircraft, you will be aware of the usual problem — they have a lot of functions, but often there is no way of directly assigning such functions to your hardware. Take the PMDG JS41, for example — you can't even assign the landing light switch to a joystick button, never mind the more complex system and functions. And the same could be said about any other add-on aircraft that doesn't use the default FSX code for its systems.

If you have encountered such problems, then perhaps you have already seen the Lua scripts which users have developed for different add-ons. They are usually long scripts with plenty of ipcParam-to-action lists, which allow us to assign custom aircraft functions to our hardware through FSUIPC's 'Button and switches' panel. They partly solve the problem, but that solution is an ugly one.

If you own the VRinsight MCP Combo, you will have discovered its problem as well. The only way to make it work with add-on aircraft is to use the modules provided by the VRinsight developer — but the list of supported aircraft is short, and somewhat outdated. It's true that you can assign some functions to MCP buttons and knobs via FSUIPC (thanks to Pete Dowson) using LUA scripts, but you may have noticed how much of a pain it is to make assignments that way.

Furthermore, if you want the VRinsight MCP to display custom information on its display then there are more problems, but unless the MCP's display reflects what is happening in FSX then it's not what it is intended for, right?

## So here comes LINDA!

It began as a simple Lua framework to assign custom functions and interact with MCP Combo display, but as that framework evolved during the development process more ideas were incorporated — and now LINDA is much more than merely an Lua framework.

LINDA in its current state is a tool to assign custom functions of add-on aircraft to your hardware's buttons and switches.

## Not only for the MCP Combo, but for any USB/HID devices you have!

It has an easy-to-use interface in which you simply choose the actions you want from the popup menu and assign them where you want them to be. And it still has that powerful Lua framework at the back end which allows you to set different actions for the same button or knob, easily switch between modes, interact with the MCP display — and do many other useful things.

- LINDA is a complete replacement for the SerialFP2 driver supplied by VRinsight.
- LINDA doesn't need any COM port emulation software, and works perfectly just by itself.
- LINDA could be, and is intended to be, used to assign custom functions to your hardware even if you don't have the MCP Combo.
- LINDA is a powerful yet user-friendly framework to create simple Lua functions, for those who like do some coding themselves.

# INSTALLATION

Before you begin:

LINDA is meant to completely replace your current assignments (except for the axes, of course).

This won't happen automatically, so don't worry, but we believe that assigning your Joystick and assigning functions to your MCP Combo panel with LINDA is now so straightforward that you wouldn't want to do it any other way.

LINDA doesn't need any assignments made through FSUIPC, either for Joysticks or for the VRinsight MCP Combo (apart from the axes, of course):

so you should first of all make sure that you delete from the FSUIPC4.ini file all the current assignments for the VRinsight MCP Combo and your joystick/yoke.

LINDA also doesn't need any further LUA scripts inside the Modules folder, since you probably now have them in the FSUIPC4.ini file.

**Before proceeding, we would strongly recommend **backing up** your complete Module folder and all its subfolders!!!**

You can then delete all the LUA and FSUIPC macro files for your various add-ons, as these will be handled by LINDA from now on.

After that, delete every Joystick Buttons entry in your FSUIPC4.ini [Buttons] section — and also be sure to do that for your add-ons too, e.g. [Buttons.A2A\_Spitfire]

You can also delete things like

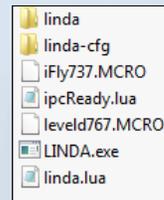
[VRInsight.FMER]

[LuaFiles]

[MacroFiles]

Now for the Installation of LINDA:

In the zip file which you downloaded you will find a bunch of number of files like these:



Just drop those files into your FSX modules folder, e.g.

Program Files (x86)\Microsoft Games\Microsoft Flight Simulator X\Modules

Congratulation! LINDA is installed!

(LINDA makes no changes whatsoever in the registry or elsewhere.)

## UNINSTALLING

Delete the above files!

Copy back your baked up files!

Congratulations! LINDA is now completely removed from your system!

# HOW TO DELETE EXISTING ASSIGNMENTS FROM FSX

Working with FSUIPC (or now with LINDA) means that you have to ensure that you don't also have your Joysticks assigned in FSX.

To delete all FSX Joystick assignments at once, do the following:

- Open your FSX folder (containing your FSX.cfg)  
(This folder is normally: C:\Users\- Open the Controls subdirectory (C:\Users\- Open the file called Standard.xml using Notepad or a similar text-only editor: do not use Microsoft Word!
- Scroll through the contents until you see the two entries for each of your Joysticks, e.g.

```
<Name>Saitek X52 Pro Flight Controller{2A5740B0-D7E8-11DF-8006-444553540000}</Name> and  
<Name>Saitek X52 Pro Flight Controller SLEW {2A5740B0-D7E8-11DF-8006-444553540000}</Name>
```

- Now delete everything between each of those entries and their next `</SimControls.Map>` entry. (Note the preceding slash).  
This removes the entire contents of the relevant sections.
- Save the edited file.

Now you have deleted all the Joystick assignments at once. Here is an example of how my Standard.xml looked afterwards:

```
<SimControls.Map>  
  <Name>Logitech Extreme 3D{2A5740B0-D7E8-11DF-8004-444553540000}</Name>  
</SimControls.Map>  
<SimControls.Map>  
  <Name>Logitech Extreme 3D SLEW {2A5740B0-D7E8-11DF-8004-444553540000}</Name>  
</SimControls.Map>  
<SimControls.Map>  
  <Name>Saitek X52 Pro Flight Controller{2A5740B0-D7E8-11DF-8006-444553540000}</Name>  
  <POV>  
    <Index>0</Index>  
    <Down>PAN_VIEW</Down>  
    <DownRpt>1</DownRpt>  
  </POV>  
</SimControls.Map>  
<SimControls.Map>  
  <Name>Saitek X52 Pro Flight Controller SLEW {2A5740B0-D7E8-11DF-8006-444553540000}</Name>  
</SimControls.Map>  
<SimControls.Map>  
  <Name>Saitek Pro Flight Rudder Pedals{4567DA00-D7C4-11DF-8001-444553540000}</Name>  
</SimControls.Map>  
<SimControls.Map>  
  <Name>Saitek Pro Flight Rudder Pedals SLEW {4567DA00-D7C4-11DF-8001-444553540000}</Name>  
</SimControls.Map>  
</SimBase.Document>
```

Note that I haven't deleted the POV entry in my main Joystick, the X52. This is the coolie hat, because I find the steering of the view better than assigned with FSUIPC

# INITIAL STARTUP

Just double-click on the LINDA.exe and LINDA starts.

You will see a similar starting screen.



Links to the Setup and Info pages

Jump directly to the Console, Tracer, or Lua Editor. Note also the keyboard shortcuts which can be used.

Reloading the LUA engine

Open the LINDA manual, or jump to the Support Forum and Bug report web page.

When run for the first time, LINDA will remind you about making fsuipc.ini settings for Joysticks and the VRinsight MCP Combo by displaying "Setup is needed".

When the settings are found, this changes to "Everything is OK".

# LINDA SETUP

On this page you can adjust LINDA's settings.

It should be obvious what each setting does from the description next to the checkbox.



# JOYSTICKS SETUP

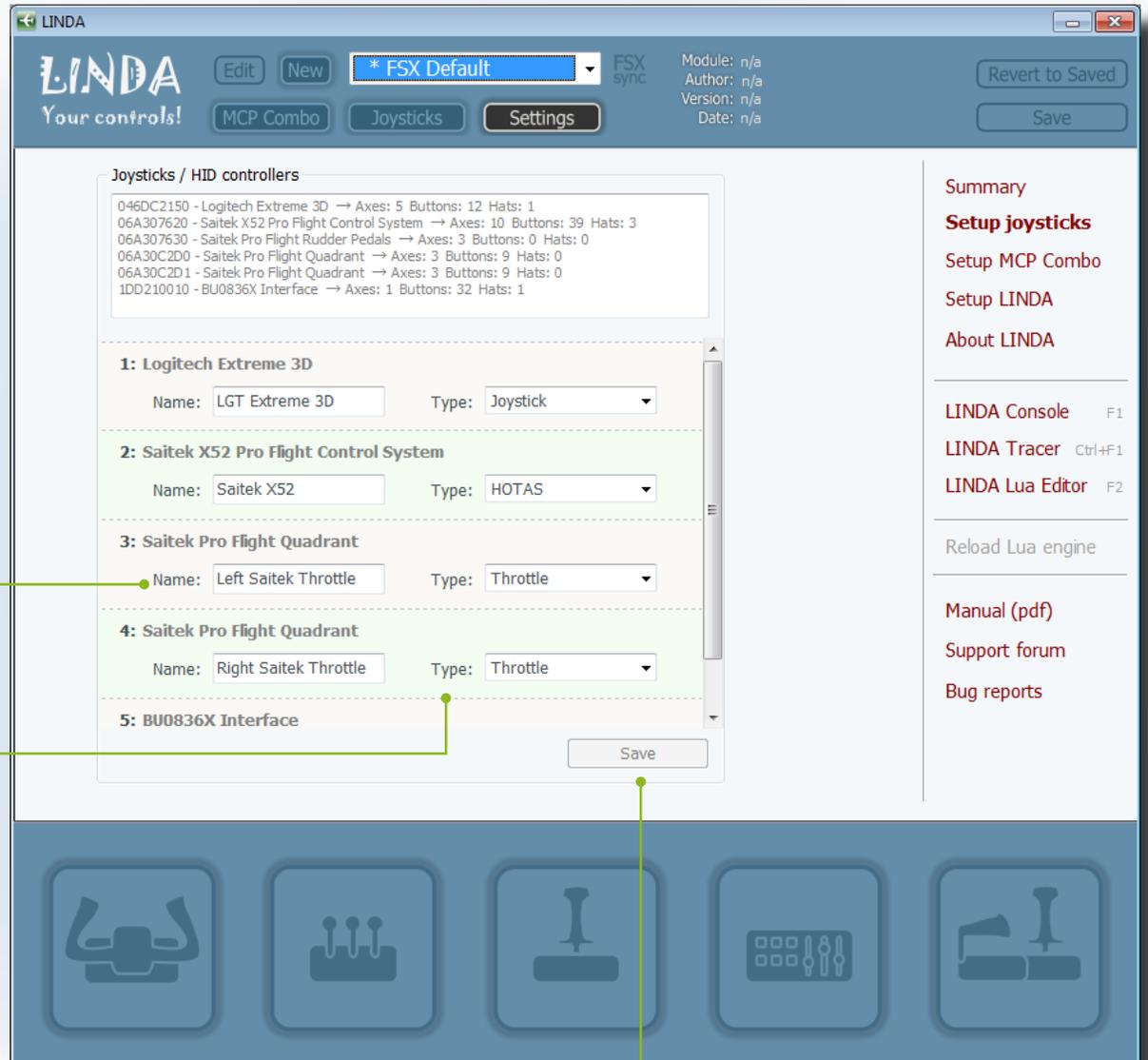
The initial setup should have been done for you automatically.  
LINDA detects your hardware and automatically names it.

Check the name assigned to be sure that the detection process has worked correctly:  
you can also adjust the name if you wish.

You can also set the type of the device manually:

- Joystick
- HOTAS
- Throttle
- Yoke
- Other

*(LINDA is not able to set this up automatically for every device).*



Click on „Save“ in every case!

# MCP COMBO SETUP

You have to select the COM Port to which the MCP Combo is connected. Normally this is COM3.

If you're not sure, start up your VRInsight SerialFP software,

(Now you can delete the SerialFP Software ;-)

LINDA will tell you whether or not your FSUIPC.ini is set up correctly.

If it isn't, LINDA can make the necessary changes for you in the FSUIPC.ini file.

The screenshot shows the LINDA software interface. At the top, there's a title bar with 'LINDA' and window controls. Below that, the 'LINDA Your controls!' logo is on the left, and navigation buttons for 'Edit', 'New', 'MCP Combo', 'Joysticks', and 'Settings' are in the center. On the right, there's a dropdown menu set to '\* FSX Default', an 'FSX sync' button, and status information: 'Module: n/a', 'Author: n/a', 'Version: n/a', 'Date: n/a'. Further right are 'Revert to Saved' and 'Save' buttons.

The main content area is divided into two sections. The 'MCP Combo settings' section has a 'Enabled' checkbox checked, a 'COM Port' dropdown menu set to 'COM 3', and a 'Save' button. The 'FSUIPC config' section shows 'Version: Start FSX to check' and 'fsuipc4.ini: Looking good'. Below this is a table with two rows:

1:	[VRInsight]	found, ok
2:	x=COM3	found, ok

Below the table is a 'Make changes for you?' button. To the right of these sections, there's explanatory text: 'You need to set your MCP Combo COM-port. You can find it out by running the SerialFP2 software - it will detect the correct port number.' and 'LINDA requires couple of lines to be added into the fsuipc4.ini file. We need them to allow FSUIPC recognize the VRi MCP Combo device. COM port number should be the same as in settings above. Example of ini block: [VRInsight] 1=COM3'.

On the right side of the interface, there's a sidebar with a 'Summary' section containing links: 'Setup joysticks', 'Setup MCP Combo', 'Setup LINDA', and 'About LINDA'. Below that, there's a section for 'LINDA Console' (F1), 'LINDA Tracer' (Ctrl+F1), and 'LINDA Lua Editor' (F2), followed by 'Reload Lua engine'. At the bottom of the sidebar are links for 'Manual (pdf)', 'Support forum', and 'Bug reports'.

At the bottom of the window, there's a row of five icons: a drone, a circuit board, a joystick, a keyboard, and a VR headset.

# THE HID DEVICES / JOYSTICKS

## Common logic

LINDA's joystick engine is pretty simple but — I believe — flexible enough for most usage scenarios. Note, however, that LINDA doesn't have the facility to assign joystick axes — use FSUIPC to do this.

This is so because in the beginning LINDA was intended for use only with buttons; hence there was no need to reinvent the wheel by making provision for axes. FSUIPC does this job much better than can be done from inside the Lua library, in view of its speed restrictions.

Each joystick button can generate 3 events:

- On Press – occurs when the button is pressed.
- On Repeat – occurs after the button is pressed and while it is held down.
- On Release – occurs when the button is released.

Each of these events could be assigned using separate functions. (See next page)

## Default actions

The functions you assign for the FSX Default aircraft will be used as the default actions for all other aircraft — unless you reassign the same buttons/switches to other functions. The logic is similar to that of FSUIPC — you have default assignments, but can override them for specific aircraft if need be. You can see that there is an assigned default when it is shown with a little star and coloured light green.

Each joystick can be in one of two modes: Normal or Shifted — with different set of functions assigned in each case. You can switch joystick modes by assigning the LOCAL SHIFT or GLOBAL SHIFT functions to any joystick button/switch and pressing it. Local shift will shift only the current joystick; whilst Global shift will shift ALL devices at the same time.

	On Press	On Repeat	On Release	Shifted
1	empty	empty	empty	<input type="checkbox"/>
2	empty	empty	empty	<input type="checkbox"/>
3	empty	empty	empty	<input type="checkbox"/>
4	empty	empty	empty	<input type="checkbox"/>
5	* Lights STROBE on	empty	* Lights STROBE off	<input type="checkbox"/>
6	* Lights BEACON on	empty	* Lights BEACON off	<input type="checkbox"/>
7	* Lights PANEL on	empty	* Lights PANEL off	<input type="checkbox"/>
8	empty	empty	empty	<input type="checkbox"/>
9	empty	empty	empty	<input type="checkbox"/>
10	* Lights TAXI on	empty	* Lights TAXI off	<input type="checkbox"/>
11	empty	empty	empty	<input type="checkbox"/>
12	* Lights LANDING on	empty	* Lights LANDING off	<input type="checkbox"/>
H1: 0	* Lights NAV off	empty	empty	<input type="checkbox"/>
H1: 1	empty	empty	empty	<input type="checkbox"/>
H1: 2	empty	empty	empty	<input type="checkbox"/>
H1: 3	* Lights NAV on	empty	empty	<input type="checkbox"/>
H1: 4	empty	empty	empty	<input type="checkbox"/>
H1: 5	empty	empty	empty	<input type="checkbox"/>
H1: 6	empty	empty	empty	<input type="checkbox"/>
H1: 7	empty	empty	empty	<input type="checkbox"/>
H1: 8	empty	empty	empty	<input type="checkbox"/>

# ASSIGNING YOUR JOYSTICKS

If FSX is already running, LINDA will detect your currently active aircraft if Synchronisation Mode (FSXsync) is on. You can disable FSXsync to change aircraft.

However, you can also start assigning without having FSX running of course.

We strongly recommend that you select and assign the **FSX default** planes first of all.

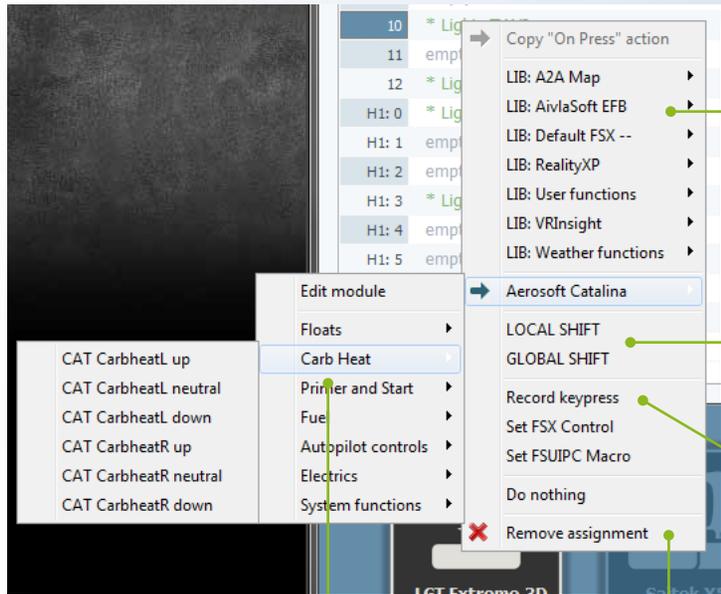
**The assignments you make for the FSX standard planes are the defaults for all other add-ons aircraft.**

e.g. If you assign 'LIGHTS Strobe' for the FSX standard planes, then 'LIGHTS Strobe' will also be available for your add-on aircraft — providing you do not set it to 'do nothing', or overwrite it with another function.



When you press a button on one of your joysticks, LINDA will “jump” to the corresponding device. The highlighted symbol will tell you which device is active: in the example above this is the Logitech Extreme 3D.

# ASSIGNING YOUR JOYSTICKS



Hovering with your mouse in the pop-up menu will open further menus.

The Libraries that LINDA discovers are shown in the upper part of the pop-up.

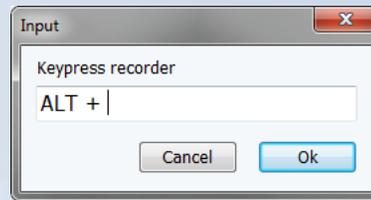
The most important one shown is the 'LIB: Default FSX--', in which you will find a number of standard FSX commands.

Libraries can also be supplied by the user for functions which are needed in more than one aircraft — such as weather radar settings, or those needed for a specific tool.

**LOCAL SHIFT:** use this to assign one or more buttons as shift buttons enabling shifted mode for as long as the button is pressed. (Also known as 'modifiers').

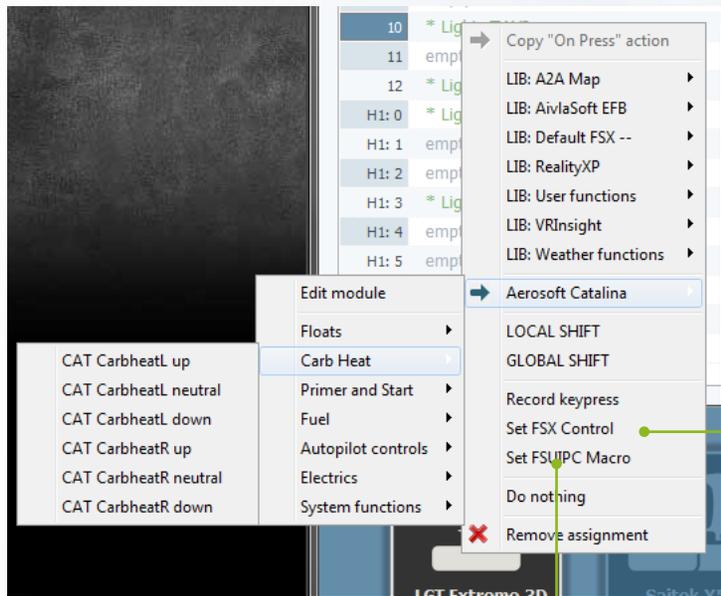
**GLOBAL SHIFT:** this will cause your entire joystick assignments to the shifted, for as long as the button is pressed.

**Record Keypress:** as the name says ...



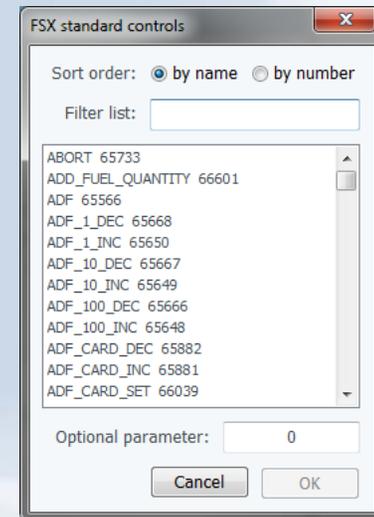
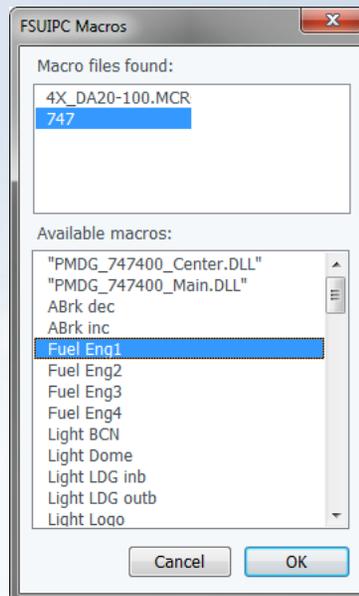
'Remove assignment' will delete the current assignment, and in the event that you assign an add-on it will show the FSX default (if one has been defined).

# ASSIGNING YOUR JOYSTICKS



**Set FSX Control:** this will open a window where you can choose from all known FSX controls. You can filter them by name or by number

**Set FSUIPC Macro:** this will open a window where you can choose from your Macros in your modules folder. Click on the macro you wish to assign and LINDA will list all functions this macro contains.



# THE VRINSIGHT MCP COMBO

## Common logic

The main advantage of LINDA over the original SerialFP2 software is in its flexibility. SerialFP2 uses simple logic (one button – one action), whereas LINDA allows you to change the functions of your buttons and knobs on the fly.

LINDA's logic operates in different **Modes**. The MCP Combo consists of three different elements: the EFIS group, the MCP group, and the USER/RADIOS group. Each group can work in one of three fully customizable modes.

This means that the EFIS group could be used to control (for example) the default FSX GPS in mode 1, the RealityXP WXR in mode 2, and the AivlaSoft EFB in mode 3. And the same could be done with the MCP and USER functions. However you are not obliged to use these modes if you don't need them in some cases.

The other enhancement is that each of EFIS rotaries could be used in two modes (let's say Mode A and Mode B to distinguish them from Modes 1/2/3 of the whole EFIS block of functions). For example, this allows us to use the same rotary for two different actions, and to switch between them by simply pressing the knob.

For example, in the PMDG JS41 module the EFIS knob's functions are:

- MINS – Decision height (Mode A) / Landing Elevation Height (Mode B)
- CTR – Circle Bearing / Diamond Bearing

Moreover, each of the knob functions has its own indications on the MCP display (wherever possible).

And all these mode-separated functions are not hard-coded anywhere, but fully and easily customizable through the GUI interface.

As an additional feature, the MCP display could be used not only to set up things inside the sim, but also to show the current flight info – the aircraft's speed, direction and altitude. You can switch this mode on or off whenever you wish. And it can also be used for those aircraft that don't have autopilot systems, or in those rare cases when there is no way to get the autopilot setting in sync with the MCP display indications (sadly, the MD-11 is one of those).

## FSX Default aircraft

The Combo's behaviour with LINDA and the default FSX aircraft will be pretty much the same as you experience with the original SerialFP2 software.

However there are some enhancements provided:

- There are 3 modes set for the EFIS block as described above.
- The CWSB button is used to switch the display into Flight info mode.
- The Radios' Mode button is configured to toggle audible (Morse) markers for NAVs, ADFs, and DMEs, and to toggle the COM1/COM2 channels.
- Some other assignments are also set up, as you can see in the GUI Add-on aircraft.

Please look in the Aircraft/PMDG JS41/readme.txt file, and also the Aircraft/Aerosoft AirbusX/readme.txt file for information about the specific functionality implemented in these modules. These are just examples of what can be done using LINDA.

# ASSIGNING YOUR MCP COMBO

The MCP Combo is already set up.

The screenshot shows the assignments for FSX's default planes. We made these for our own needs and what we felt was logical. So the EFIS part is mostly assigned to control the FSX GPS. Of course you can change this as you wish to suit your personal needs. And, as with joystick assignments, you can make your own individual assignments for each addon!

Making assignments works similarly to making Joystick assignments: clicking opens a pop-up menu.

Note that the rotary knobs have two different rates of movement: slow (+,-) and fast (++,-).

Assigning the slow speed will automatically copy the same setting to fast dial, because this is needed 95% of the time. Be sure to always make assignments for slow and fast dial!

Also remember that the dials' knobs have two modes (A and B as described above).



The MCP Combo functionality is divided in **3** parts, as shown in the graphics: **EFIS** on the left side, the **MCP** part (which is the biggest) in the middle, and the **User Buttons (UB) /RADIO** section on the right-hand side. Simply click on the diagram of the appropriate section to activate it.

# MCP COMBO MODES



For each part of the MCP (EFIS, MCP, and UB/RADIO) you have three modes available! Each of these 3 modes can be fully configured according to your wishes.

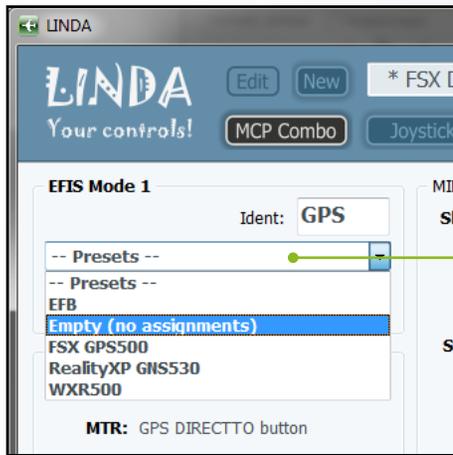
Click on LINDA's tabs to switch between the modes, in order to assign them.

If you have no use for a third mode then Mode 3 can be checked or unchecked to enable or disable it.

You can choose a short name for each mode with a maximum length of four characters. This name will be shown in the MCP display if switched into that mode.

User buttons 6, 7, and 8 are assigned as the mode toggles.  
(You can change this if you wish, but it is recommended that you use the defaults).

## MCP COMBO PRESETS



Each mode has its own presets, which can be found top left. Clicking on the down arrow opens a drop-down menu where the presets are listed. Choosing one of these presets will completely set up your assignment with a single click.

This is useful if you have e.g. the WXR500 installed in several planes.

Now you can assign all your WXR500 functions in one step —to EFIS mode 3, for example.

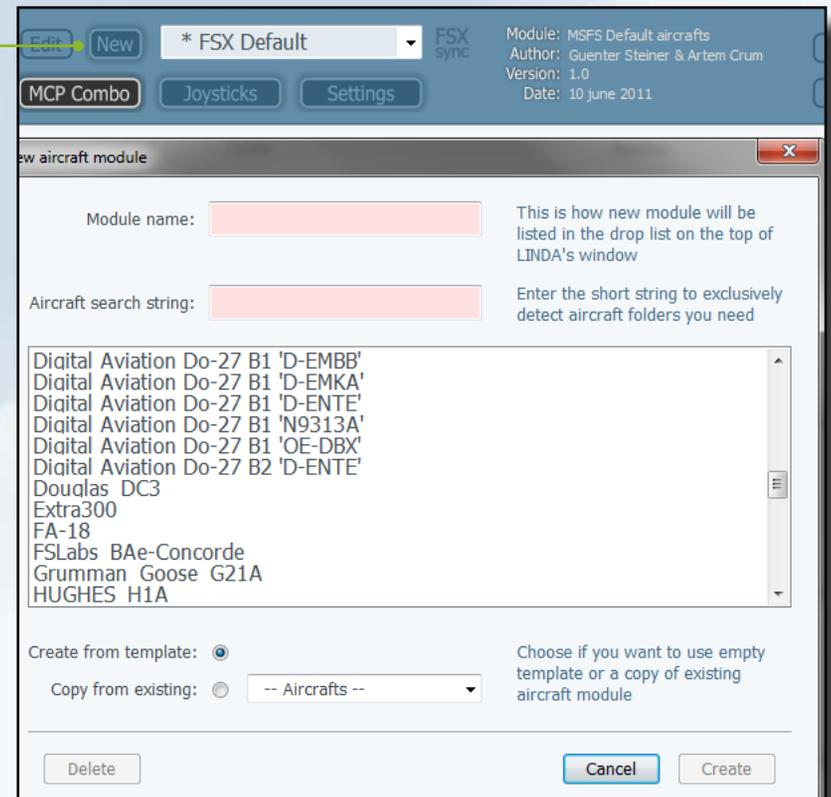
Of course you can create and save presets of your own if needed.

## CREATING NEW AIRCRAFT SETUPS

LINDA comes with a small set of ready-assigned and listed aircraft. You can assign your own add-ons if you simply click on “new”. This opens a new window where your aircraft (and helicopters) will be listed. Choose the one you wish to assign and click “create”.

Module names are selected automatically; however you can change them if you wish.

You can also copy an existing assignment to create the new one.



# THE LINDA TRACER GUIDE

The following text is not intended as a comprehensive guide to how LINDA's Tracer should be used, and this is also not a tutorial on how to create aircraft modules for LINDA from scratch. Before proceeding you should already know what the FSX standard controls are, as well as understanding FSUIPC offsets and Lua variables (LVars). This is simply an example scenario of Tracer usage.

(Please look at the FSUIPC documentation for information concerning Macros, LUA Variables and offsets — everything you need is pretty well described there).

## LINDA Tracer's purpose

Creating Lua scripts for add-on aircraft requires you to know how that particular aircraft is designed, and how its custom systems are integrated inside the common FSX environment.

It all depends on the add-on-developer how the complex systems for their addons can be accessed: they may have used an FSX control (e.g. ROTOR\_BRAKE (65587) with countless parameters), or else FSUIPC Offsets — or they may have used XML gauges with their associated variables that can be directly accessed by corresponding LVars inside FSUIPC's Lua engine.

So LINDA Tracer is a tool to inspect, trace and monitor each of these three possibilities — LVars, Offsets and Controls — to understand how each add-on is designed from its internals, and to figure out how to deal with its custom systems using an Lua script.



# LET'S GO HUNTING!

## First steps

Let's say we want to trace and inspect the RealAir Duke Turbine and create a simple Lua function to control the Cowl Flaps. (Remember that this is just an example).

1. Start LINDA and FSX
2. Choose the Duke and any airport you like
3. Load the flight and prepare the Duke up to the point where the Cowl Flaps are required (ready for taxi is enough).
4. Switch to LINDA and open the Tracer window (by clicking the menu or by pressing Ctrl+F1)

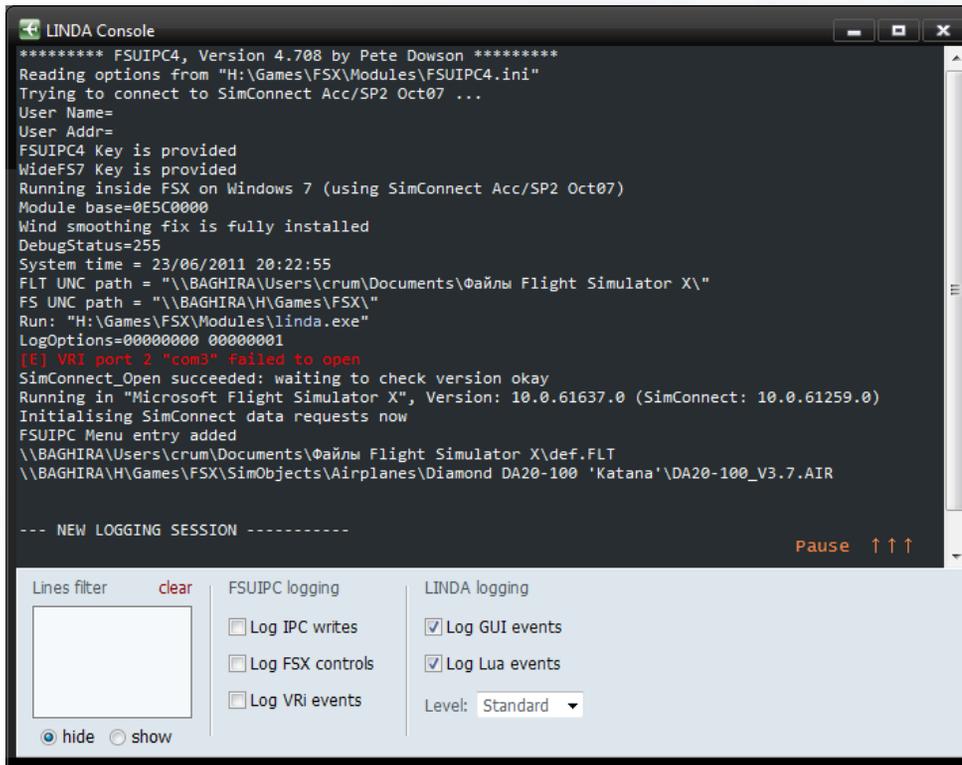
The screenshot displays the LINDA software interface. At the top, the title bar reads "LINDA" and the main header includes the "LINDA GOES HUNTING!" logo, "Edit", "New", and a dropdown menu set to "RealAir B60T". On the right, it shows "Module: RealAir Duke Turbine", "Author: Artem Crum", "Version: 1.0", and "Date: 10 june 2011". Buttons for "Revert to Saved" and "Save" are also present.

The main interface is divided into several sections:

- Lua variables:** A list of variables such as "ADF\_On\_Switch", "ADF\_Operational", "adfAntBut", etc. A "Filter:" input field and "Reload LVars list" button are at the top. "Save watching list" and "Restore watching list" buttons are also visible.
- FSUIPC Offsets:** A section for monitoring memory offsets, currently showing "0x 0000". It includes options for "Type and size" (UB, UW, UD, DD, DBL, STR) and "Output format" (DEC, HEX, BIN). A "Calculate:" field with "\*1/1" and an "Eval" button are present.
- FSX controls:** A section for controlling FSX parameters, with "Sort order:" set to "by name". It includes a "Filter:" input field and a list of control values like "ABORT 65733", "ADD\_FUEL\_QUANTITY 66601", etc.
- Send / Scan value:** A section for sending and scanning values, with "Param:" set to 0, "From:" set to 1, and "To:" set to 1. Buttons for "Send" and "Scan" are available.

At the bottom of the interface, there is a row of five icons representing different aircraft or systems: a drone, a turboprop engine, a joystick, a control panel, and a turbine engine.

The console window:



```
LINDA Console
***** FSUIPC4, Version 4.708 by Pete Dowson *****
Reading options from "H:\Games\FSX\Modules\FSUIPC4.ini"
Trying to connect to SimConnect Acc/SP2 Oct07 ...
User Name=
User Addr=
FSUIPC4 Key is provided
WideFS7 Key is provided
Running inside FSX on Windows 7 (using SimConnect Acc/SP2 Oct07)
Module base=0E5C0000
Wind smoothing fix is fully installed
DebugStatus=255
System time = 23/06/2011 20:22:55
FLT UNC path = "\\BAGHIRA\Users\crum\Documents\Файлы Flight Simulator X\"
FS UNC path = "\\BAGHIRA\H\Games\FSX\"
Run: "H:\Games\FSX\Modules\linda.exe"
LogOptions=00000000 00000001
[E] VRI port 2 "com3" failed to open
SimConnect_Open succeeded: waiting to check version okay
Running in "Microsoft Flight Simulator X", Version: 10.0.61637.0 (SimConnect: 10.0.61259.0)
Initialising SimConnect data requests now
FSUIPC Menu entry added
\\BAGHIRA\Users\crum\Documents\Файлы Flight Simulator X\def.FLT
\\BAGHIRA\H\Games\FSX\SimObjects\Airplanes\Diamond DA20-100 'Katana'\DA20-100_V3.7.AIR

--- NEW LOGGING SESSION -----
Pause ↑↑↑
```

Lines filter  clear

hide  show

FSUIPC logging

- Log IPC writes
- Log FSX controls
- Log VRI events

LINDA logging

- Log GUI events
- Log Lua events

Level: Standard ▼

OK. Now let's suppose that we don't know anything about how the custom systems interaction is implemented in this bird.

In fact that's not exactly true because, as you can see, the LVars list is full of items. This means that Duke is probably using them to control its systems. But there are cases where an add-on uses both LVars and FSX Controls, e.g. the PMDG JS41.



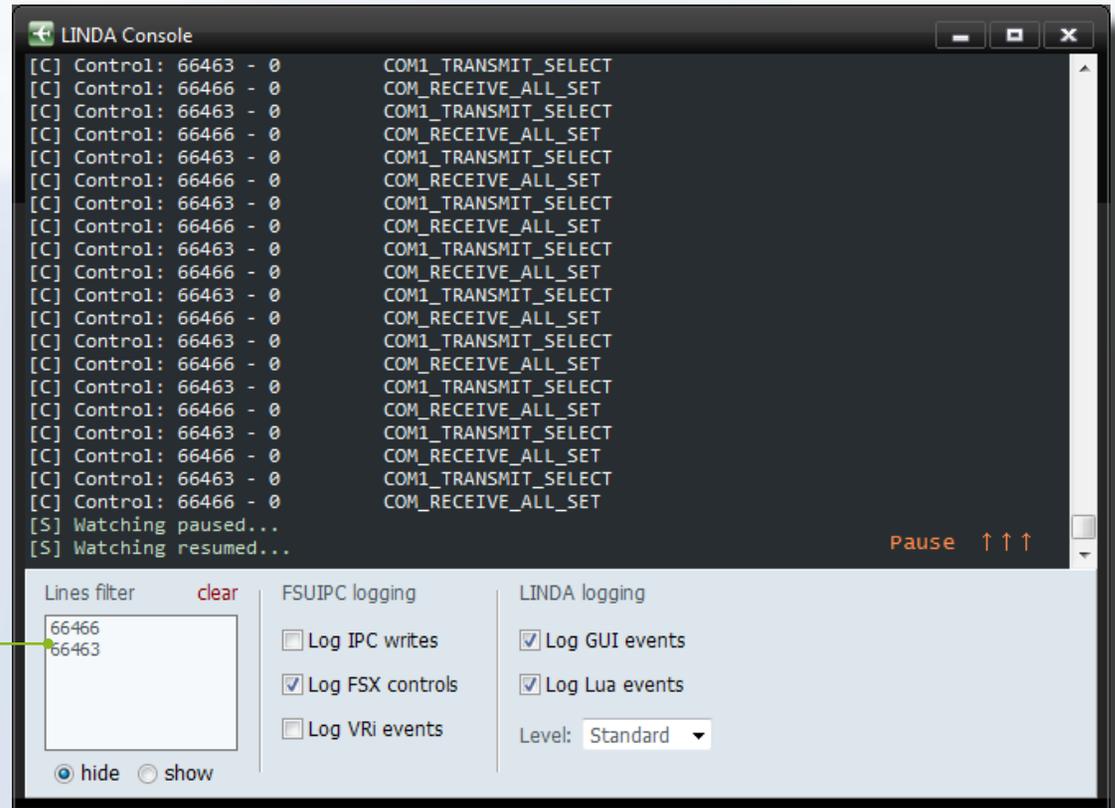
To filter the incoming text you should:

1. Pause the logging (by clicking the Pause link inside the console window, or by pressing the spacebar).
2. Open the bottom control panel (if it's not open already).
3. Type the text you want to filter, with one item on each line as shown.

#### Some notes about the filter

- There's no need to type the whole line of text you want to be filtered. Just type a short unique part of it. In the case of FSX controls, the best way is type the individual control numbers (and not the control names).
- Also you can RIGHT-click on the control number, and you will then get a popup menu with an item in it saying "Filter text: ..." — this will add the indicated text to the filter.
- The filter has two modes: hide and show.  
The first will hide all the lines containing the specified string.  
The second will filter out all the lines NOT containing those strings.

In the case of the Duke we should add only two repeating controls: 66466 and 66463. Then our console will be empty and awaiting further investigation. Don't forget to Resume (un-pause) the monitoring.



Now you can check if everything is correct by clicking any of the light switches on the Duke's panel. After each click you will see a report in the console about what control was just called. But if you click the switch for the Cowl Flaps the console shows you nothing. This means that the Cowl Flaps switches are not tied to any of the FSX standard controls, and we now need to trace the LVars. So switch off the logging of FSX controls — and don't forget to clear the filter, since that operates not only on the FSX controls but on all the text in the console.

#### Some notes on the FSX controls list in the LINDA Tracer:

- RIGHT-click any control in the list to call it inside FSX
- For any control you can also set the optional parameter to call it with.
- You can scan a control by calling it with a range of parameters.

## Tracing LVars

The methodology here is pretty much the same as we used with FSX controls.

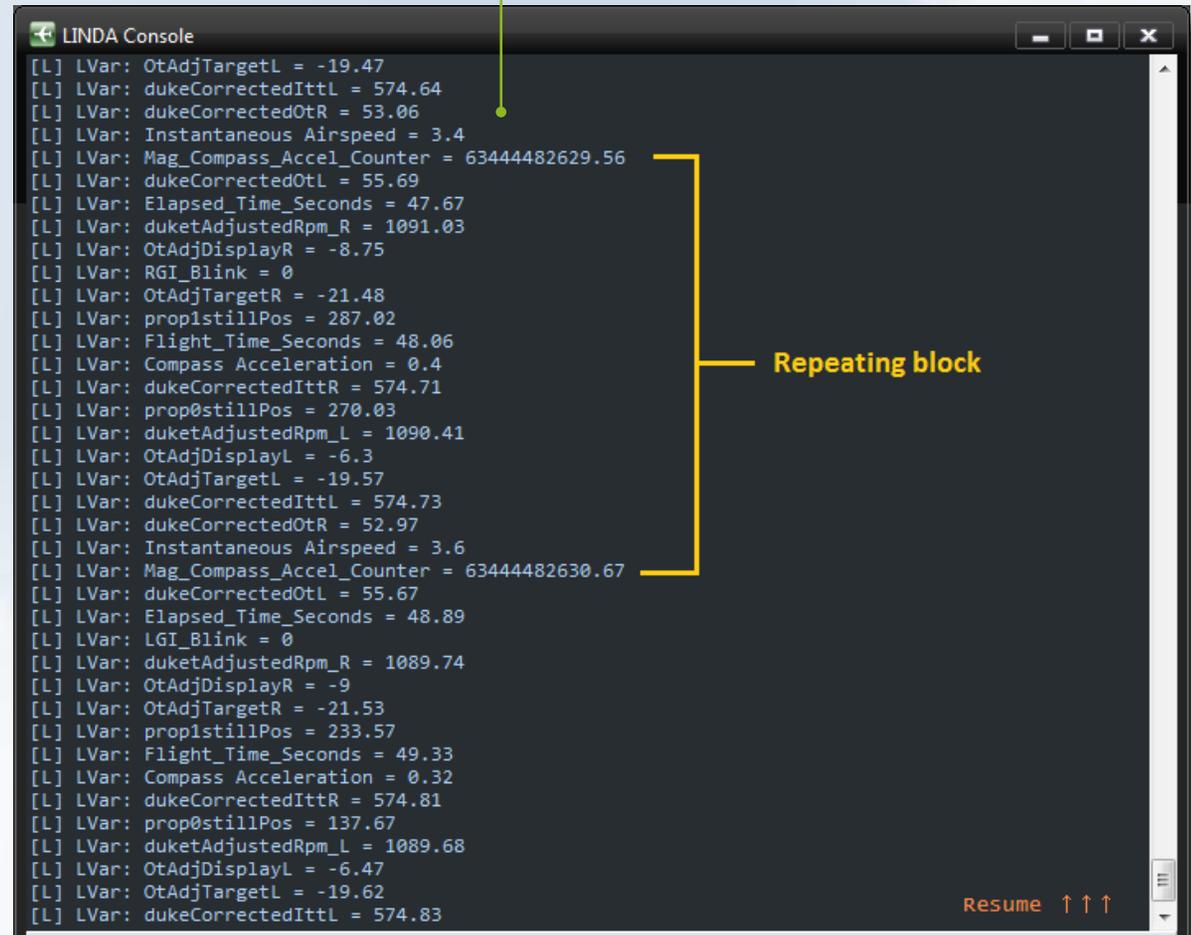
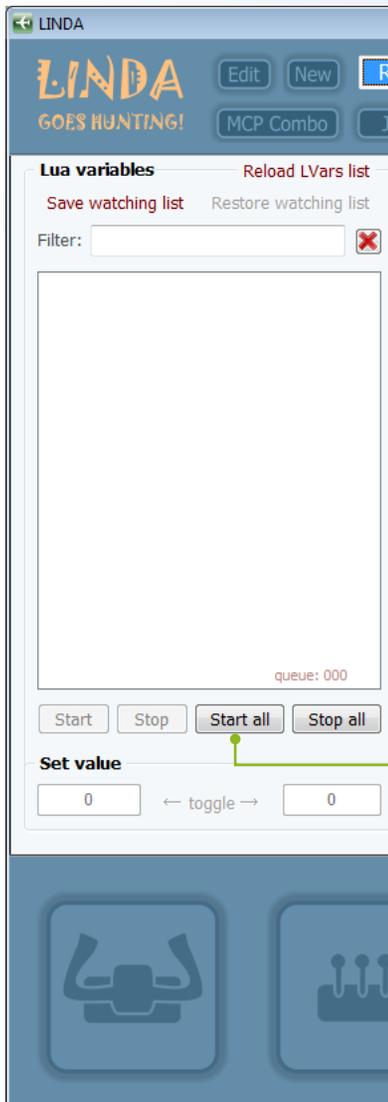
First of all we need to start the monitoring of ALL LVars for this aircraft.

Press the “Start all” button, and wait until the console tells you that the monitoring has started. There will be a delay, depending on how many LVars are in the list.

Note that sometimes the LVars list may fail to load automatically.

If so, simply press the “Reload list” link to request the list again.

When full list LVars monitoring starts you will once again see the console flooded with a repeating list of variables and values.



Again, we need to filter out those lines that of no interest. This could also be done by a text filter, but the smarter way is to stop monitoring the LVars we don't need.

You can do this manually by selecting an LVar in the list and pressing the "Stop" button (or by RIGHT-clicking the item in the list). But the fastest way is to RIGHT-click the variable's name inside the console window and choose the "Stop watching: ..." option from the drop-down menu.

Sometimes you will see LVars' names that are not in your list. I don't know where they come from, but in any event you can get rid of them by using the common text filter.

Do it for all repeating LVars and check if you need to filter something else by resuming/pausing the logging if you will need it.

Do this for all repeating LVars, and check whether you need to filter something else by resuming/pausing the logging if you need to.

When we have achieved our list of LVars cleansed of all repeating items, we can save that list for future use by clicking on "Save watching list". On our next hunting session we could then restore this 'cleansed' list by simply clicking the "Restore watching list" link.

That's a convenience, you have to admit.

And now the magic moment! When we click the Cowl Flaps switch inside FSX, the console shows us the corresponding LVars that we were looking for!

Some notes on LVars controls in the LINDA Tracer window:

- LEFT-click on the LVar name to get its current value.
- RIGHT-click the LVar name to start continually monitoring it; the item will be shown in bold and in colour. RIGHT-click it again to stop monitoring.

```
LINDA Console
[L] LVar: dukeCorrectedOtr = 84.7
[L] LVar: OtAdjDisplayR = 22.96
[S] Watching stopped for LVar: OtAdjTargetR
[S] Watching stopped for LVar: dukeCorrectedOtr
[L] LVar: OtAdjDisplayR = 22.97
[L] LVar: OtAdjDisplayR = 22.96
[S] Watching stopped for LVar: OtAdjDisplayR
[L] LVar: Duke_Cowl_Flaps_Switch_2 = 1
[L] LVar: Duke_Cowl_Flaps_Switch_2 = 2
[L] LVar: Flight_Time_Minutes = 58
[L] LVar: Flight_Time_Start = 63444480070.15
[L] LVar: Elapsed_Time_Start = 63444480070.15
[L] LVar: Elapsed_Time_Minutes = 58
[S] Watching stopped for LVar: Flight_Time_Start
[S] Watching stopped for LVar: Elapsed_Time_Start
[S] Watching stopped for LVar: Elapsed_Time_Minutes
[S] Watching stopped for LVar: Flight_Time_Minutes
[L] LVar: Duke_Cowl_Flaps_Switch_2 = 1
[L] LVar: Duke_Cowl_Flaps_Switch_2 = 0
[L] LVar: Duke_Cowl_Flaps_Switch_2 = 1
[L] LVar: Duke_Cowl_Flaps_Switch_2 = 2
[L] LVar: Duke_Cowl_Flaps_Switch_2 = 1
```

**Cowl Flaps switch detected!**

Pause ↑↑↑

Lines filter **clear**

Mag\_Compass\_Accel\_C  
Compass Acceleration

FSUIPC logging

Log IPC writes

Log FSX controls

Log VRI events

LINDA logging

Log GUI events

Log Lua events

Level: Standard

hide show

# LINDA

## Your controls!

LUA INTEGRATED NON-COMPLEX DEVICE ASSIGNING

Idea, Programming and Design: ARTEM CRUM  
Inspiration, Testing and Support: GÜNTER STEINER

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