Opencockpits

CHRONO B737 & B737 LI Manual

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Introduction:

The CHRONO B737 V1 is a step forward for increasing reality in a simulated flight with our cockpit. This module has been developed for users who want a more realistic simulation respect navigation and control estimated flight times, times and dates of both the captain and first officer.

The module is connected through the USB port of the computer and is managed by SIOC software (free for non-commercial environments), using at least version 4.5.

CHRONO B737 :

This new module provides in real size and has operational all key buttons for total realism. The module has fixed backlight and has software control for digits lights intensity. The digits are white.

The module is fully configurable with SIOC, making it compatible with FSX and any add-ons you have installed, if you use the correct script. On the website of Opencockpits is available a generic script that works with all basic FSX planes though options can be added to integrate into specific performance of any add-on.

CHRONO B737 LI:

This module Chrono B737 LI is equal to the full version but without the needle function.

Specifications:

- External power supply 6V DC included.
- Control for white digits intensity for software.
- USB 2.0 connection without drivers (plug&play).
- Boeing matte paint with 737 grey or 747/767 brown.
- LI versions: white or yellow digits as an option.
- Chronograph with fully functional seconds hand (except versions LI).
- Management Timer to 1 hour, Estimated up to 24 hours, Zulu time information, with month and year controlled modification system of leap years and days of the relevant month with FlighSimulator automatic update.

Appearance and measures:

- Measures: 110x110x80mm total, 89x89mm seen.
- Outline panel mounting: see Annex I.

The set is shipped with the following items:

- Chrono B737 V1 Module.
- Power supply 6V DC, 2A.
- USB cable.

Starting the Crono:

We already have our B737 Chrono V1 unpacked and we visually inspected, install and configure appropriate now, for it We will plug the cables included in the package, USB & supply, to the computer.

For the Chrono is recognized and work properly must have SIOC 4.5b1 or higher installed and use the appropriate script (all downloadable from the Opencockpits support website).

Once the module is connected, it will automatically turn on all digits and the backlight and the needle will give a lap to self calibrate the stepper motor (this step is not performed on LI versions). SIOC will recognize and display the following screen:
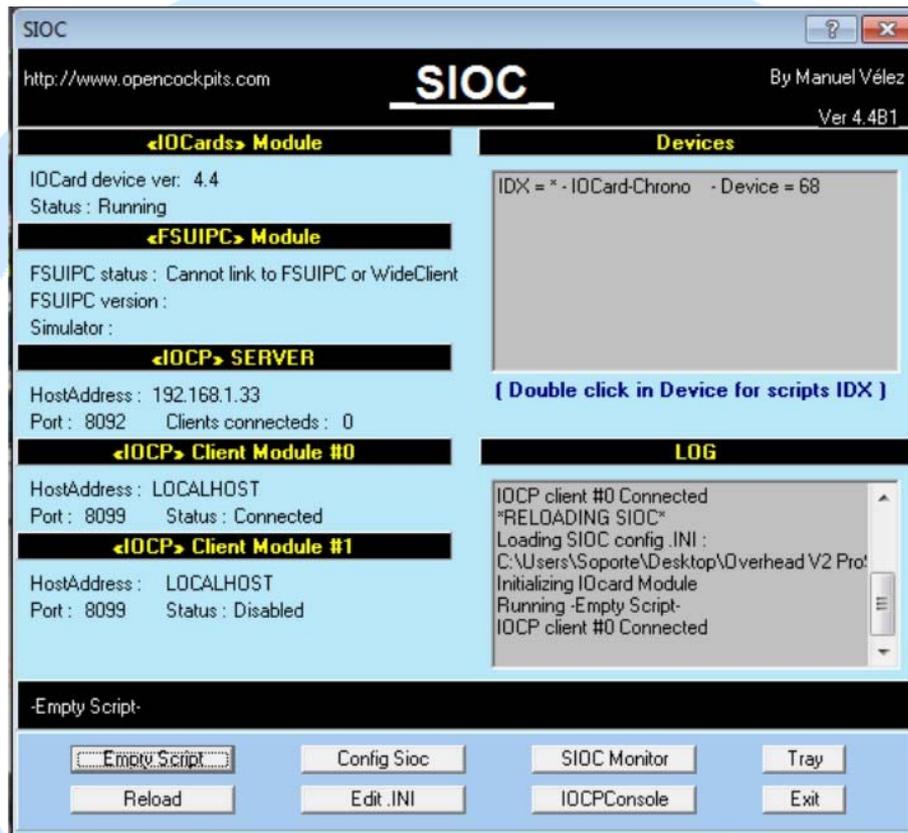
Module's declaration in sioc.ini:

This module has a IOCard developed exclusively for him. Declared as other Opencockpits modules:

MASTER=Index device, Type, Number of cards, USB Device number

Index device = number that will identify the Chrono in scripts (IDX in SIOC window and DEVICE in the script). In our example the 16 but can be any other number unused in the IDX.

Type = 16, fixed number that tells SIOC which is a B737 Chrono737 Opencockpits Module.

Number of cards = 1, 1 for only one Chrono present or 2 for two chronos present.

USB Device number = USB port number where the module is connected.

That is, the declaration of our CHRONO B737 V1 on tests is:

MASTER=16,16,1,XX

Where 16 (red) is fixed (Chrono B737 IOCard type) and 16 (black) is the IDX we want to give and should match the device mentioned in the script. In each case the value XX is replaced by the value of the USB port where the module is installed. Now to declare the module in our sioc.ini. We run SIOC, click on the Edit INI button, this will open the text editor with our current sioc.ini, where we declare our module in section

[------------- CARDS CONFIG -------------]
[IOCard Master]
MASTER=16,16,1,68
[Chrono V1]

The USB port 68 is what we get in our testing PC, in your computer can come another value, replace it, save the changes and close the text editor, click the SIOC Reload button and if all went well the module Chrono B737 V1 is properly recognized with an IDX 16 instead IDX *, to do tests with it. To check if the card works correctly we must make a test script, so we must be able to define the elements of the clock.

All this can be managed, if desired, in a much more intuitive option of SIOC: CONFIG DEVICES.

Definition of the elements of the card for use with SIOC:

The definition of all elements of the card for use with SIOC is:

```
// *******************************************************************************
// * Opencockpits CHRONO B737  -    By Manolo Vélez   -   www.opencockpits.com
// *******************************************************************************
// * FileName : CHRONO_Definicion.txt
// DIGITS
Var 100, name D_UPRIGHT, Link IOCARD_DISPLAY, Digit 0, Numbers 2
Var 102, name D_UPLEFT, Link IOCARD_DISPLAY, Digit 2, Numbers 2
Var 104, name D_DWRIGHT, Link IOCARD_DISPLAY, Digit 4, Numbers 2
Var 106, name D_DWLEFT, Link IOCARD_DISPLAY, Digit 6, Numbers 2
Var 108, name D_CHRBRIGHT, Link IOCARD_DISPLAY, Digit 16, Numbers 3
// OUTPUTS
Var 200, name DECIMAL_U, Link IOCARD_OUT, Output 20
Var 202, name DECIMAL_D, Link IOCARD_OUT, Output 21
Var 204, name DECIMAL_C, Link IOCARD_OUT, Output 22
// MOTOR
Var 300, name M_MOTOR, Link IOCARD_MOTOR, Output 1, Aceleration 0
// SWITCHES
Var 400, name I_CHR, Link IOCARD_SW, Input 0
Var 402, name I_TIMEDATE, Link IOCARD_SW, Input 1
Var 404, name I_SET, Link IOCARD_SW, Input 2
Var 406, name I_PLUS, Link IOCARD_SW, Input 3
Var 408, name I_MINOR, Link IOCARD_SW, Input 4
Var 410, name I_RESET, Link IOCARD_SW, Input 5
Var 412, name I_ET, Link IOCARD_SW, Input 6
Var 414, name I_INITPOS, Link IOCARD_SW, Input 7
```

Programming Notes:

The outputs are activated with 1 and de-activated with 0.

With these data we will generate the script and test the module.

Module Test Script:

Now we will have a script with which we can test the functionality of the buttons and indicators on the module with a text editor like notepad or a similar.

```
// **************************************************************************
// * Config_SIOC ver 4.4   -    By Manuel Velez   -   www.opencockpits.com
// **************************************************************************
// * FileName : CHRONO_test.txt
// * Date : 25/07/2013
Var 0000, Value 0
{
  &D_CHRBRIGHT = 120  // Brillo de los dígitos-Digits bright
  &inicia_timer = DELAY 1 ,500  // Retardo de iniciación del timer-Delay timer start
  &D_UPRIGHT = 0  // Dígitos arriba derecha a 0 - UpRight digits to 0
  &D_UPLEFT = 0  // Dígitos arriba izquierda a 0 - UpLeft digits to 0
  &D_DWRIGHT = 20  // Dígitos abajo derecha a 20 - DownRight digits to 20
  &D_DWLEFT = 5  // Dígitos abajo izquierda a 5 - DownLeft digits to 5
  &DECIMAL_D = 1  // Punto decimal abajo a 1 - Down dot to 1
  &DECIMAL_U = 0  // Punto decimal arriba a 0 - Up dot to 0
}
Var 0100, name D_UPRIGHT, Link IOCARD_DISPLAY, Device 16, Digit 0, Numbers 2
Var 0102, name D_UPLEFT, Link IOCARD_DISPLAY, Device 16, Digit 2, Numbers 2
Var 0104, name D_DWRIGHT, Link IOCARD_DISPLAY, Device 16, Digit 4, Numbers 2
Var 0106, name D_DWLEFT, Link IOCARD_DISPLAY, Device 16, Digit 6, Numbers 2
Var 0108, name D_CHRBRIGHT, Link IOCARD_DISPLAY, Device 16, Digit 16, Numbers 3
Var 0200, name DECIMAL_U, Link IOCARD_OUT, Device 16, Output 20
Var 0202, name DECIMAL_D, Link IOCARD_OUT, Device 16, Output 21
Var 0300, name M_MOTOR, Link IOCARD_MOTOR, Device 16, Output 1, Aceleration 200
Var 0400, name I_CHR, Link IOCARD_SW, Device 16, Input 0
Var 0402, name I_TIMEDATE, Link IOCARD_SW, Device 16, Input 1
Var 0404, name I_SET, Link IOCARD_SW, Device 16, Input 2
Var 0406, name I_PLUS, Link IOCARD_SW, Device 16, Input 3
Var 0408, name I_MINOR, Link IOCARD_SW, Device 16, Input 4
Var 0410, name I_RESET, Link IOCARD_SW, Device 16, Input 5
Var 0412, name I_ET, Link IOCARD_SW, Device 16, Input 6
Var 0414, name I_INITPOS, Link IOCARD_SW, Device 16, Input 7
Var 0498, name pulsos, Value 0
Var 0499, name Segundos, Value 0
Var 0500, name S_TIMER, Link SUBRUTINE
{
  IF &pulsos = 1
  {
    &DECIMAL_U = 1
    &pulsos = 0
  }
  ELSE
  {
    &DECIMAL_U = 0
    &pulsos = 1
    &Segundos = &Segundos + 1
    IF &Segundos > 59
    {
      &Segundos = 0
      &D_UPLEFT = &D_UPLEFT + 1
    }
    &D_UPRIGHT = &Segundos
    L0 = 4065 / 60
```

```
    L0 = L0 * &Segundos
    &M_MOTOR = ROUND L0
  }
}
Var 0001, name inicia_timer
{
  &S_TIMER = TIMER 1000 ,0 ,50
}
// End of File CHRONO_test.txt
```

Save it as CHRONO_test.txt, connect our B737 CHRONO to our computer as we have seen in previous chapters, we run SIOC, press the SIOC Settings button, go to the option to import txt file menu and select the script you just saved:
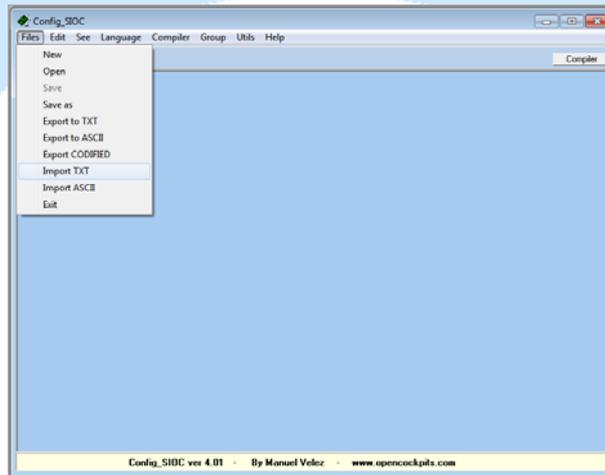
If all goes well you will see a screen like this:
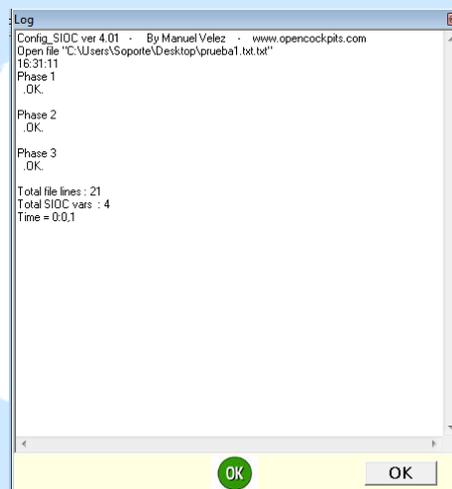
In case there was any compilation errors would get a notice saying what is wrong with a red notice, which would have to review our script. As everything went well we have our script compiled in Config SIOC:
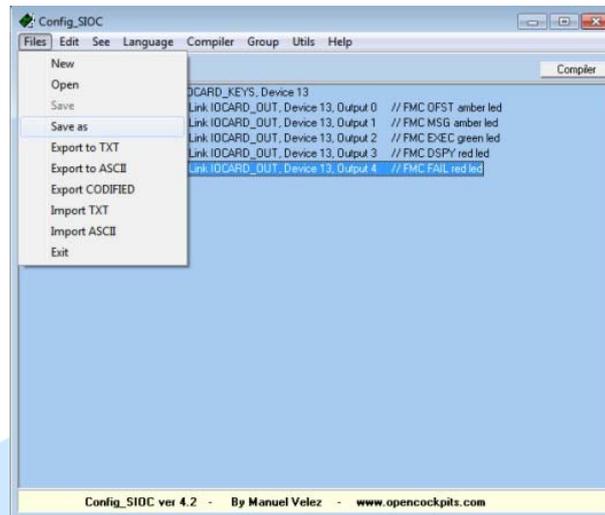
We go to the "Save As" from the File menu and we save with the name of sioc.ssi in the folder where you installed SIOC. We left SIOC setup and return to the main screen of SIOC, where we check if in sioc.ini is declared to be loaded the sioc.ssi file. We press the Edit INI button and check if there is at the beginning of sioc.ini the line:

CONFIG_FILE=.\sioc.ssi

If yes, close the text editor without making any changes, return to the main Sioc screen where we press the Reload button to make all changes in both sioc.ssi and sioc.ini files, within 5 seconds of starting the script the clock must start the timer and the needle will start to turn.

Clock Operation:

The clock can be programmed to any add-on which has offsets available for the plane's clock through FSUIPC and SIOC. Here we will describe the operation of the clock with FSX and basic B737 series with the script (created by Carlos Lopez and modified by Manuel Vélez) available in Chrono download's tab.

This clock has two displays of 4 digits each. In the upper visualize the year, month and day or time in MM.SS, HH.MM format, switching between these 4 options with the TIME / DATE button.
When connecting the clock to the USB and the power supply, it auto-calibrate the needle in the versions that have it, when starting the script will show the clock Zulu time on the upper display, the needle is put on position of 45 seconds (for a better view the displays) and the lower display will remain off until we activate it by pressing any key on the clock. As we press a key timer mode is activated by turning on the lower display.

Also, the SET button will activate the blinking digit to modify using the + and - buttons, so it is not necessary to enter the FSX menu to change the date or time, but we can do it directly from the clock and FSX will update automatically.

To change the date or time, will bring into flashing each digit (for couples). Note that lights up the digit 2 dot point to separate hours from minutes, minutes of the seconds or the day of the month, depending on what you're watching.

There are two buttons to control the displays below. CHR button activates the timer and the ET button activates Elapsed Time:

CHR Function: Pressing, what we see on the display is the stopwatch. The second time you press, it starts. The third we stop and so on. If we set it to zero, press the RST button. The information shows format MM: SS and when arrived at 59:59 back to start the stopwatch from scratch.

This particular module has an additional option for us to know at all times if we are in CHR or ET mode: if mode ET only blink dot point what separate the minutes and seconds of the lower display and when we remain in CHR mode, the righter dot point of the bottom display (which is stamped with text "CHR") will remain on.

ET function: Pressing the button shown on the display Elapsed Time. The second time you press, it started. The third we stop and so on. If we want to set it to zero, press the RST button. The information is shown in MM: SS format for the first hour, then we'll see in HH: MM.

If we want to disable the timer and see only the time or dates just press the key combination CHR + RST, which disables the lower display.

Calibration of the needle:

The module comes factory calibrated, but if for any problem the needle will upset, we could re-calibrate it following this procedure:

1. - The cover engraved is removed along with clock crystal display by removing the two Phillips screws.
2. - It loosened the screw that secures the needle shaft to the motor shaft, just behind the backlight black PCB.
3. - Turn on the module with 6V power supply, automatically calibrates the position of the motor shaft and as the needle is loose we put it to 0 (60).
4. - Tighten the set screw of the needle shaft.
5. - Turning off and on again. Check that when the spin calibration ends the needle is in place, if it is not we repeat the procedure from step 2 to 5. If is in its place, we turn to the next point.
6. - We put the screen, the cover and screwed.

Links of interest:

Support zone for customers:

http://www.opencockpits.com/catalog/info/

Annex 1:

Template for drilling and cutting to install the chrono on the MIP.

110,00mm

89,00mm

110,00mm

89,00mm

Cortar el MIP por la línea verde para insertar el crono y taladre los agujeros para fijarlo.

Cut the MIP for green line to insert the chrono and drill the green holes to fix it.