MCP737EL

This manual is intended for Flight Simulator use only and may not be used in any real world aviation application. The authors are not responsible for any errors or omissions.

FOREWORD

Thank you for your MCP737EL choice; through this hardware you will meet a realism never experienced before in your flight with Flight Simulator. This manual gives you the information to connect and use the MCP737EL panel with Microsoft Flight simulator and the supported FS add-on aircraft.
Note: This manual contains the latest information at the time of drafting. Due to the continuous evolving of the product some features can be modified. Eventual later information can be found at CPflight website www.cpflight.com

The CPflight modules are produced to meet requirements from the hobby market. The use of our products in professional or commercial environments is not permitted without the approval of CPflight management; please contact us at info@cpflight.com if you need to exploit our products in professional or commercial environments.
The MCP737EL reproduces the Boeing 737 Mode Control Panel (more simply known as autopilot). Even though this hardware was developed on basis of B737 models, it can also be used with the other default aircrafts of MS Flight Simulator. This manual assumes the user is familiar with the procedures and acronyms used by FS, to better understand how the MCP737 functions operates in a different way than FS standard.
IMPORTANT: the MCP737EL supports default FS aircraft and third part add-on aircraft using FSUIPC data format and offset. Freeware and commercial add-on aircraft using their own software modules or gauges may use different data format and offset and for this reason it is not possible to assure always the compatibility. For further information see "Compatibility" page on CPflight website www.cpflight.com
The MCP737EL forms the center of an expandable system, through the 5 pole expansion socket it is possible to connect external modules like EFIS selectors, radios etc. The compatibility and the supported functions of the extension modules are bound to the used software (default FS aircraft, Project magenta, PMDG etc.).
Due to the continuous evolving in the compatibility and in the third parts software and drivers it is impossible to give timely information in this manual, for up to date informations about the compatibility please consult our website at www.cpflight.com.

CONNECTIONS

Sockets for connections are on the back of panel

Fig. 1 Connectors (back view)

A - Power supply socket
B - USB
C - 5 poles DIN socket
D - Jumpers for firmware upgrade
E - External TO/GA
F - External Backlight control

DEVICE SUPPLY

The MCP737EL and 2 eventual EFIS can be directly powered by the USB; If you need to connect further CPflight expansion modules to radios and boards an optional power supply adapter can be required. Is available at CPflight website. Some expansion modules have already the power supply adapter.
WARNING! Only suitable stabilized plug-in power supply adapter must be used; do not attempt to plug in different adapters as you may irreparably damage the MCP.

USB DRIVER INSTALLATION

When you connect the MCP for the first time it will be asked for the USB driver installation. The drivers are available for download at CPflight website. To install the drivers follows these steps:

➢ Download the file "usbdriver.zip" at www.cpflight.com
➢ Files are in a compressed archive .zip; unzip the files in a temporarily folder.
➢ Connect the USB cable to the MCP737 USB connector and the other side to a free USB port of your computer. The computer has to be switched on when you connect the MCP for the first time.

➢ The driver installation procedure will start automatically; follows the instruction on the screen (note that the figure of the following example may be different depending by your operating system).


When you will ask to connect to Menus Update to search for software select "No, not this time" and click next to continue.
Select "Install from a list or specific location" and click next to continue.

Browse the temporarily folder where you have unzipped the files and click next to continue. You will be informed that the driver has not been subordinate to Menus Logo testing click "continue anyway". The drivers will be installed in the system, click "Finish" when prompted.

Important note: Depending by the system it may be required to repeat the driver installation two times.
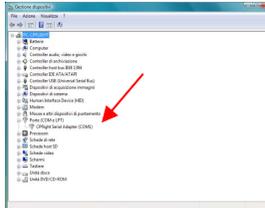
During the USB drivers installation the system assign a number to the communication port. Check your configuration in the Windows Control panel -> System Property -> Device Manager Tab. On the (COM & LPT) port you will see "CPflight serial adapter (COM n)" where "n" is the assigned communication port number, you will use this number in the First set up.

SOFTWARE INSTALLATION

Beyond the USB drivers there are some software to install to allows data exchange between the MCP737EL and FS. It is possible to download the drivers at our site www.cpflight.com.
The applications are included in a compressed archive, to install the software unzip the files in a temporary folder and run "setup.exe" then follow the instructions on the screen. Start the installation as administrator in all the Windows systems.
The procedure will install the following exe applications:
- **FS_COM:** is the communication software used to manage data exchange with FS. Run this application when using the MCP737EL with the default FS aircraft or FSUIPC based add-on. Do not run FS_COM when using the MCP737EL with Project Magenta or Prosim or add-on provided with their own drivers.
- **TestCPflightHardware:** allows to directly check the hardware. Do not run FS or other applications.

The data exchange between FS_COM and FS (or Prepar3D) occur through the popular FSUIPC, if you do not have FSUIPC in your system download it at http://www.schiratti.com/dowson.html. We suggest to register your copy to exploit all the auxiliary features allowed by FSUIPC. More information about FSUIPC at http://www.schiratti.com/dowson.html. Download FSUIPC in the correct version. The presence of FSUIPC is requested. Please contact directly the site of the productor of FSUIPC.

MCP START-UP

To start the MCP run FS_COM on the FS menu (in the figure the FSX version). Note that FS_COM is specifically dedicated to the FS default aircraft and FS_COM supported add-on (for up to date information please consult the site). If the MCP is used with Project Magenta or add-on provided with their own drivers you have not to run FS_COM.
The first time you run FS_COM you have to select the communication port number; select the port number assigned by the system during the USB driver installing (see "USB DRIVER INSTALLATION" section above). The MCP737 will start automatically running FS_COM.exe (or running Project Magenta, ProSim etc

depending by the used software). The MCP737 will show on the displays the serial number and the installed Firmware revision, and then synchronize data with FS.
Note: If you do not use MCP737 for a long time it is recommended to disconnect the power supply.

FUNCTIONING

It is important to know that the hardware has not its own intelligence on board, it establishes an interface with the connected software; logics, operating modes and aircraft behavior are managed by the software. When used with third part software (Project Magenta, ProSim PMDG etc), the supported functions are those supported by the software itself.
The FS_COM is developed on Boeing 737 model, so the functions could slightly differ from the default FS autopilot operating. Operating modes are affected by the settings of the MCP, by the previously engaged mode and by the existing flight situation. In some cases a pushbutton may be disabled depending by the actual conditions; in some other case a mode will be engaged automatically. When a Mode is selected on the MCP, a dual dot light illuminates on the button; this indicates that mode is active or "Armed": pushing the button again will deactivate this mode. In some cases, a mode selection will deselect a previously engaged or armed mode. If the LED remains off when you push a button this means that this mode is not selectable in the actual condition. If you use MCP737 with the standard FS panel on screen, it is important that you refer only to MCP hardware panel because, depending by the situation, there can exists differences between panels indications.
When you load a saved flight, the MCP synchronizes data with FS, this allow you to recall values saved in a previous flight. The toggle switches position (A/T ARM, FD and disengage bar) are hardware master, so they will be synchronized to FS independently by the condition saved with the flight.

LNAV and VNAV: As the default FS aircraft have not LNAV and VNAV capability, these modes are operating only with the add-on that supports these functions. With the default FS aircraft the LNAV function engages the GPS mode.

AUTOLAND: the "APP" mode is the only mode which allows both CMD A + CMD B autopilot engagement for an instrumental landing. To engage the dual A/P mode (CMD A + CMD B) both NAV1 that NAV2 radio have to be tuned to the same ILS frequency and the APP mode must be armed. Engaging both A/P is then possible if the aircraft is at a radio altitude greater than 800ft RA; below this altitude it is not possible to engage the second autopilot.

CWS A and B: these modes are operating only with the add-on that supports these functions (see our website www.cpflight.com).

EXPANSIONS

The DIN 5pole socket (see Fig.1) allows the connection of CPflight plug&play add-on modules. You may add modules at anytime; the MCP forms the center for data exchange between modules and flight simulator. The MCP explores the line at start-up and detects the connected units. Each add-on module has two 5 pole connectors. The MCP is connected to the first module, the second one connect itself to the first. Connection cables are provided with the modules.
Note: The compatibility and the supported functions of the extension modules/boards are bound to the used software (default FS aircraft, Project magenta, PMDG etc.). Further information can be found on our website. Disconnect the MCP power supply and USB cable before connecting any module.
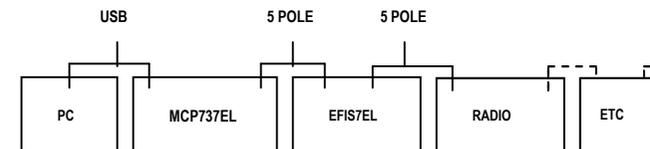
EXTERNAL TO/GA (optional plug/cable required)

External TO/GA (see Fig.1 item "E") can accept input from a pushbutton. The pushbutton contact must be open in normal condition and close only when pressed, do not connect steady position switches to this input.
EXTERNAL BACKLIGHT CONTROL (optional plug/cable required)

External backlight control (see Fig.1 item "F") accepts input from steady position switch (ON/OFF). Note that the MCP backlight also affects the backlight of the connected modules (if any). To use the external

backlight control set the related preference to "ON" in the preferences setting (see "CONFIGURATION MODE" section).

ON-FLY DISPLAY BRIGHTNESS AND BACKLIGHT REGULATION

When the MCP is normal running (starts with Project Magenta, PMDG or in test mode using the CPflight test software) you can set the display and backlight brightness on-fly. This function is not available if the related preferences are settled "On" in the configuration menu (see above "CONFIGURATION MODE" section). To change the display brightness hold pushed the N1 button and rotates the Left Course knob; to regulate the backlight brightness hold pushed the N1 button and rotates the SPEED knob. The MCP keep the regulation in its working memory, data are saved in a memory when the MCP switch-off (data are not saved if you disconnect the MCP power supply during the normal running).

CONFIGURATION MODE

The MCP737EL firmware provides an internal program mode to configure some preferences in the hardware functionality. With the MCP in stand-by (software not running) push and hold the C/O key for more than 1 second; this start the hardware in configuration mode. This is the only way to access to the configuration mode; no PC software program is required to configure the MCP737EL hardware. In configuration mode only some keys are operating such as Left Course, IAS and HDG:

Left Course display	IAS display	HDG display
Function to be settled	Parameter	Setting

C/O key (push and hold for more than 1 second): enter the program menu.
N1 key: scroll to the next program menu.
**SPEED** key: toggle the preference setting.
C/O key: save changes and exit the configuration mode.
Settings are saved in a non-volatile memory when you exit the configuration menu and the MCP goes in stand-by. Follow a description of the menu available in Configuration Mode:

CONFIGURATION MENU	Course display	IAS display	HDG display
BACKLIGHT CONTROL: I : (default) the backlight will light-up when the NAV lights in FS are ON. E: the NAV lights status will be skipped and the backlight can be controlled through the related auxiliary input. ICS: only operates in conjunction with the CPflight "ICS" board system (option). With this setting the MCP backlight is bound to the Cockpit lights brightness control panel (Captain "MAIN PANEL" bright).	EbL	Ctrl	I/E/ICS
DISPLAY BRIGHTNESS CONTROL: Setting this function to "OFF" (default) the display brightness can be regulated during the normal functioning as described above (see "ON-FLY DISPLAY BRIGHTNESS AND BACKLIGHT REGULATION"). Setting this function to "ON" interdict the on-fly display brightness regulation.	dSP	briG	OFF/On
SERIAL NUMBER: This menu shows the device serial number on the IAS/MACH and HEADING display. It is a read only location and is not modifiable.	Sn	xxxx	xxx
FIRMWARE RELEASE: This menu shows the installed firmware release on the HEADING display. The number is not modifiable in this menu, it is updated when you load a new firmware in the MCP internal memory (see "FIRMWARE UPDATE" section).	Rel	*blank*	xxx
COUNTER: This menu shows the Hours of MCP running on the IAS/MACH and HEADING display. It is a read only location and is not modifiable. *Note: the "xxxxx" in the above menu act for the total Hours of MCP running from 0 to 99999.*	Cont	H xx	xxx
BATTERY: Setting this function to "OFF" (default) the MCP ignores the Battery and/or Alternator status in the FS variables. Setting this function to "On" the MCP (and connected modules) display remains dark if the FS Battery and/or Alternator status is off.	bAt	*blank*	OFF/On

FIRMWARE UPDATE

The MCP hardware is based on a microprocessor, on this device run a special program called "firmware". The firmware manages all the hardware functions besides the communication with the computer. The firmware is stored in a "flash" memory, this allows the program to be updated at any time in case of improvements, functions addition or new add-on modules support. The firmware is available at CPflight website; the revision number is progressive, so a higher number correspond to a latest version. Before to proceed with the upgrade, check the installed firmware revision. You can see the installed version on the display HEADING at the MCP startup.
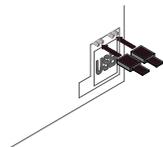
In some circumstances a firmware upgrade may require an updating of the drivers and/or add-on software, if you encounter any malfunction after a firmware update, check the software version and update the software if required.

To update the firmware follow these steps:
Download the firmware at: www.cpflight.com, please assure to download the correct version.
➢ Files are in a compressed archive .zip; unzip the files in a temporarily folder.
➢ Disconnect supply (USB cable) from the MCP; disconnect external modules and expansion board if any.
➢ Insert the two jumpers (provided) on the pins located on the back of the MCP (see figure).
➢ Connect power supply to the MCP. A small flash on the backlight indicates that the MCP has started in firmware program mode.
➢ Close any application on the computer, browse the temporary folder that contains the downloaded firmware and run UPGRADE.EXE program. The following dialog will prompt.
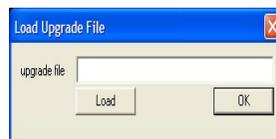
Select the port number assigned during the driver installation (see "driver installation section") and click OK. Click on "Load" button and browse the MCP737ELxxx.mot file (where xxx represents the release number) in the folder where you have extracted the firmware files, select it and proceed.
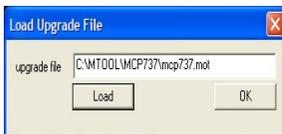
The file name will be shown into "upgrade file" field click OK to proceed. Click on the erase button to clear the memory for programming.

At the end of erase phase the above dialog will prompt, click OK to proceed. Now click on program button.
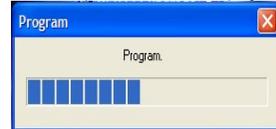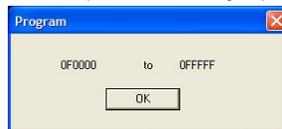
The program shows the info about the memory area to be programmed, click OK. The memory programming will take some time. During the programming the MCP backlight will flash.

At the end of program procedure the above dialog will prompt, click OK to continue. Now click to exit button and wait until the dialog will close before proceed.

Once the firmware has upgraded:
➢ Disconnect supply from the MCP and remove the two jumpers from the pin.
➢ Reconnect external modules and expansion board if any.
➢ Reconnect power supply (USB) to the MCP, the displays will show the new installed Firmware

OVERVIEW
Painted and laser engraved front panel with aluminum back cover.
6 digital encoders to set: Altitude, Vertical Speed, Heading, Speed, Left Course, and Right Course.
Toggle switches for Left Flight Director, Right Flight Director and Auto Throttle.
Flat lever switch for disengage
Pushbuttons with integrated dual dot lights for mode selection
C/O, SPD/INTV and ALT/INTV round buttons
7 segment yellow LED displays for selected value of: Altitude, Vertical Speed, Heading, Speed, Left Course, and Right Course.
Display brightness regulation
Led indication for: Left Flight Director, Right Flight Director and Auto Throttle.
16 bit Flash micro controller
USB interface
DIN 5 pole connector for daisy chain plug & play modules interface
Supply 6vdc 1A (option)

The crossed out wheeled bin label that can be found on your product indicates that this product should not be disposed of via the normal household waste stream, To prevent possible harm to the environment or human health please separate this product from other waste streams to ensre that it can be recycled in an environmentally sound manner. For more details on available collection facilities please contact your local government office or the retailer where you purchased this product.

LINK/REFERENCES: http://www.cpflight.com