project magenta

Introduction

The Project Magenta Instructor Station features a scripting language which allows you to interact with the simulator in a number of ways. It is a very useful tool to execute reproducable scenarios.

It allows you to set the aircraft position, interact with the autopilot and fmc as well as change offsets and it also allows to perform "manual" flight. Data logging can be switched on.

The main file is the script.txt file and it is loaded from the /Scripts subfolder in the Instructor Station directory.

There are two basic script files, more will follow:

/pmInst/Scripts/script.txt
/pmInst/Scripts/definitions.txt

To load and start a script, you click on "Load Script" on the Main page of the Instructor Station. Once a script is loaded, it can be started, paused, stopped and reset.

The general commands are structured as follows:

[command] [parameter1] [parameter2] …

On is translated internally to 1, Off is translated to 0. E.g. you can use AP On or AP 1 with same result.

The script language also has the ability to fly without using the autopilot, this is the so-called FLY mode, it allows you to control the aircraft as if a pilot were flying it manually. (see the FLY section)

Also, you can press Alt-C at any time and directly enter individual script commands

General

The script language is very simple, it is listed in text files such as script.txt

The file can be edited within the instructor station.

scenario [scenarioname1]
...
scenario [scenarioname2]
…
scenario [scenarioname3]
…

e.g.: three scenarios, one to set the flaps to takeoff, the other to cycle the flight director the third one calls both scenarios:

```
scenario setflaps
flaps up
sleep 3
flaps takeoff

scenario resetautopilot
fd1 off
fd2 off
fd1 on
fd2 on

scenario preptakeoff
//calls the first two scenarios then sets some autopilot values
call setflaps
call resetautopilot
alt 10000
hdg sim
spd 145
```

Definition file (definitions.txt)

Allows you to define specific settings for trim, flaps, thrust lever (gate) positions.

e.g. def trim takeoff 600

This can be used in a scenario as:

trim takeoff

instead of

trim 6000

Positioning

posrwy [airport-runway]
will position the aircraft on the given runway, if runway is omitted, the first one will be selected
ex: posrwy KJFK22R

posnav [navaid-id]
will position the aircraft over the given navaid
ex: posnav KLAX, posnav SMO
you can set posnavalt posnavspd and posnavhdg first

posils [airport-runway] [distance-direction]
will position the aircraft on an ILS approach to a runway with a distance and direction and set the frequencies

ex: posils LIMC35L 10, posnav KJFK22R 8L

posalt [altitude]
poshdg [heading]
posspe [IAS/speed]

will position the aircraft on an ILS approach to a runway with a distance and direction and set the frequencies
ex: posalt 25000, poshdg 265, posspe 220
Note: Speed can't be set in FS2004

Navaids

nav1 [frequency/ID]
nav2 [frequency/ID]

adf1 [frequency/ID]
adf2 [frequency/ID]

crs1 [OBS Course]
crs2 [OBS Course]

Autopilot

Modes

ap on, ap off, ap1 on, ap1off, ap2 on, ap2 off
autopilot

at on, at off
autothrottle

fd on, fd off, fd1 on, fd1off, fd2 on, ap2 off
flightdirector

hdg, vs, spd, flch (or opclb opdes), app, loc, toga lnav vnav
autopilot/autothrottle modes

ls1, ls2
airbus ls modes

ex:

fd2 on
flaps takeoff

Settings

hdg [heading]
sets the heading in the autopilot

spd [IAS]
sets the speed in the autopilot

vs [ft/min]
sets the vertical speed in the autopilot

alt [altitude]
sets the altitude in the autopilot

FLY Modes

fly [on/off]
fly spd [airspeed/off/0]

fly hdg [airspeed]
fly trk [track]
fly trk [waypoint]
fly bank [bank]

fly alt [altitude]
fly pitch [pitch]
fly vs [vertical speed to reach set altitude]

Other Controls/Commands

gear [up/down]
flaps [up/full/takeoff/1/15/value0-16384]
trim [-16383 to 16383/takeoff]
rudder [-16383 to 16383/takeoff]

throttle [optional engine] [percentage – positive and negative]
throttle 1 50
throttle 75

spoiler [percentage]

gate [idle/clb/toga/mct] (airbus gates)
fuelpercent [percentage of fuel load]
pause [on/off]
slew [on/off]

call [scenarioname]
sleep [seconds]
apcommand [0x4F2 offset command for autopilots]
sys [sysvar variable] [sysvar value] e.g. sys fsautobrake 4
offset [offset in hex] [offsetlength] [value] e.g. offset 4F4 2 72

centercontrols –centers flight controls
parkbrake on/off

brakes [percentage]
brakeleft [percentage]

brakeright [percentage]

starteng [1/2] – starts engine 1 or 2
stopeng [1/2]

controlload [waits for dynamic control loading to be operative – if installed]

time [time to set in FS]
time 1620

bankfactor [percentage] Fly mode pitch and bank factors
pitchfactor [percentage]

load {filename}.sit (xplane) or load {filename}.fpl (fsx/p3d)
load testflight.sit

Conditional commands

These commands will wait for a given condition:

wait ias below 220
wait hdg 175
wait altitude above 1000
wait agl below 250
wait dis below 12 (will wait until a selected waypoint is less than 12 NM away)

wait loc (waits for localizer intercept)
wait loc act (waits for loc deflection)
wait gs (waits for gs intercept)
wait gs act (waits for gs alive)

wait stable (waits for stable values of IAS VS BANK)

if [sysvar] [=,>,<,!=,<>] [value] **goto** [labelname]

or

if [sysvar] [=,>,<,!=,<>] [value]
[commands]
endif

label [labelname]
goto [labelname]

preset – loads FMC preset file
preset KJFKTEST

scratch – writes to FMC scratchpad

message – displays a message in the instructor station
message TEST COMPLETE

log on/off – activates deactivates log

log reset – resets all logged values

log val clear – removes all logged values

log pause
log mark – sets a vertical line in the log

log val alt n1 vs ias (logs specified values, can be in multiple lines)

log save {filename}

hardware or hw enables/disables specified hardware input

hw off (disables hardware)
hw on (enables all hardware again)
hw trim on/off
hw gear on/off
hw throttle on/off
hw brk off
hw ele/ail/controls

page – changes instructor station page
page MAIN
page LOGGER