

DESCENT MANAGEMENT SYSTEM V2.0

Users Guide

Description

The Descent Management System is intended for use with medium and heavy jets which lack a high-end FMS. Its purpose is to calculate the Top of Descent and then manage the descent of the aircraft to a point where either a manual or an instrument landing can be undertaken. During descent, the vertical and horizontal speeds are both managed via the autopilot. If an overspeed situation is imminent, spoilers are deployed until the speed stabilizes. Vertical speed can either be managed automatically or manually, and automatic spoiler deployment can also be disabled if required.

Note that an active flight plan must be loaded for the Descent Management System to operate. If no flight plan is loaded, a message will be displayed and the Descent Management System (DMS) will remain inoperative.

The Descent Gauge has only been tested with FSX – however it may work with other versions of Flight Simulator as well

Installation

Unzip the downloaded file and copy the **TOD_Gauge_V1.CAB** file into the relevant PANEL folder. Installation in the 2D panel is straightforward. An example is given below of adding the DMS as sub-panel 17:-

```
// panel.737_800WH
[Window Titles]
Window00 = Main Panel
Window01 = Radio Stack
Window02 = Test_AirSpeed
Window03 = Throttle Panel
Window04 = Overhead Panel
Window05 = Trim Panel
Window06 = PFD
Window07 = MFD
Window08 = EICAS
Window09 = Mini Panel
Window10 = GPS
Window11 = Jelair Vspeed call
Window12 = Alternate FMC
Window13 = PUSHBACK
Window14 = Fuel Manager
Window15 = WX Advantage Radar
```

```
Window16 = DEBUG
Window17 = TOD Gauge
```

The sub-panel can then be added to the existing sub-panel definitions. An example of a definition that works quite well is given below:-

```
//-----

//Descent Gauge
[Window17]
BACKGROUND_COLOR = 16,16,16
ident = 30037
visible = 0
sizeable = 1
size_mm = 325,377
window_size = 0.169, 0.349
position = 3
gauge00 = TOD_Gauge_V2!fmc_TopOfDescent

//-----
```

Note that an icon has been provided (ident=30037) which can be inserted in the 2D panel cfg file in order to provide a convenient option to toggle the sub-panel on and off:-

```
gauge24 = B737_800!annunciator_panel_gear, 958, 454, 66, 71
gauge25 = B737_800!Knob_N1_Set, 755, 454, 43, 46
gauge26 = TOD_Gauge_V2!TODIcon, 393, 440, 15, 15
gauge27 = HoneywellFMC_V3!fmcIcon, 409, 440, 15, 15
gauge28 = SimIcons1024!Fuel Icon, 425, 440, 15, 15
```

Remember that the actual gauge number and position will depend on your own panel configuration and position preferences – the above is just an example to illustrate how the icon is deployed.

Operation

First load a valid flight plan. This is required in order to determine the location of the destination airport. Then turn on the DMS using the power knob as indicated:-



If no valid flight plan has been loaded, this will be flagged and no further operation will take place.



If however a valid flight plan has been loaded the system will initialize but will show no further activity until the aircraft has climbed above the Bottom of Descent altitude, which is equal to the AGL at BOD plus the altitude of the destination airport.



Final Approach is the distance from the airport of the Bottom of Descent. Left-click on the APPR DIST button sets a distance of 15 nautical miles while Right-click sets a distance of 25 miles. Any other distance can be set by placing the mouse over the button and using the scroll wheel.

AGL at BOD is the altitude above ground level at the destination airport. A value should be selected which allows either a realistic manual final approach, or easy ILS interception. As with the Final Approach setting, Left-click on the button sets a value of 2000 feet, while Right-click sets a value of 3000 feet. By using the scroll wheel on the mouse, a height up to 4500 feet can be set.



Default V/S is likewise set to -1800 ft/min by left-click, -2400 ft/min by right-click, and any value down to -4500 ft/min using the scroll wheel. Note that if Auto-V/S is selected, that this will be treated as an initial value and will be recalculated as required by the DMS.

The **AUTO V/S** button toggles between automatic Vertical Speed calculation and simply displaying the required vertical speed, which then has to be set on the autopilot manually. This is to facilitate use in conjunction with air traffic controlled flight.



When in manual mode, the caption on the **AUTO V/S** button is dimmed.

The **SPLR ARM** button toggles the automatic arming of the spoilers. When in automatic operation, the spoilers will be deployed whenever there is imminent risk of overspeed occurring during descent. This can be disabled by clicking on the button as indicated. When armed, the percentage spoiler deployment is displayed – either 0%, 35%, 50% or 100%.

As with the AUTO V/S toggle, when automatic spoiler deployment is disabled, the button caption is dimmed. The alert **Spoilers Manual** is then displayed on the screen.

ALERT! When used in conjunction with a Flight Management Computer/System such as Garrett Smith's FMC, VNAV should be disabled once Top Of Descent is reached, otherwise unpredictable outcomes may occur.



Once Bottom of Descent is reached, the Vertical Speed is set to 0, and the Autopilot altitude setting is set to AGL at BOD plus the altitude of the destination airport, which is shown in brackets in feet immediately after the destination airport name (ie 4475 feet in the example shown above).

At altitudes below 10 000 feet the aircraft speed is limited to a maximum of 250 knots. As Bottom of Descent is approached, the Autopilot speed may be further reduced.

Note that during the flight, the total descent height and the required vertical descent speed required to arrive at Bottom of Descent at the correct ETA and position is continuously calculated and displayed. This may initially be a bit confusing, but as soon as the calculated Top of Descent is reached, the calculated descent height and distance are confirmed and applied.

Legal Stuff

There isn't much legal stuff. This is freeware – my way of saying Thank You to the FS community for decades of wonderful engagement – largely made possible by the generous donation of time and skill by folks who sought no financial reward.

This software may be freely distributed and posted on any reputable FS website or forum. My only request is that credit be given, and no changes be made without clearly indicating where such changes have been made.

This add-on gauge may NOT be sold for gain, or included in any compilation that is sold for gain.

There is no guarantee for this add-on gauge either explicit or implied. Use it at your own discretion and risk. If you like it, great. If not, then simply uninstall and move on. Please do not complain if it fails to meet your expectations, although constructive comments and criticism will be welcomed.

Contact Details

Lee Hall - e-mail: tudorcannon@gmail.com

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