DCSMP Quick start guide

Version 1.0.2.4 (1.0rc4)

Introduction

Like many of the people that will end reading this guide, I can say that aircraft and computers are my passions since my childhood. I've flown in the virtual sky for many years and seen flight simulators improve so much that nowadays immersion is mostly limited by the pilot behavior rather than hardware and software (let's forget physics for a second).

In my career as a virtual pilot, I was told and then realized that planning is important as flying and, despite apparently boring, it can be a lot of fun. Online sessions on the usual hardcore sims helped me to see the beauty of a proper planned mission. The point is that we do not fly planes for living, we need a tradeoff between immersion and effort.

The idea of writing DCSMP was born at the end of a training mission that was planned too quickly … to make it short I had to declare fuel emergency on landing. During the next few hours I realized that I had all the information needed to properly plan the mission and a program could have done all the math in realtime.

DCSMP is obviously a project based on a need, started for fun and developed in my (little) free time. I know it has not yet a professional quality, but I tried to give it a good set of features. It can be improved in several ways and I hope that the community will help to do so.

Egon “Rider” Carusi

License

DCSMP is licensed under a Creative Commons Attribution-NonCommercial 4.0 Inernational License.

The author kindly asks webmasters, wherever possible, to avoid to mirror the DCSMP package. The download page on AMVI website is the preferred distribution source.

Installation & Prerequisites

DCSMP is distributed in a ready to launch form: just unpack the zip file to a directory of your choice and double click the DCSMP icon to start the program.

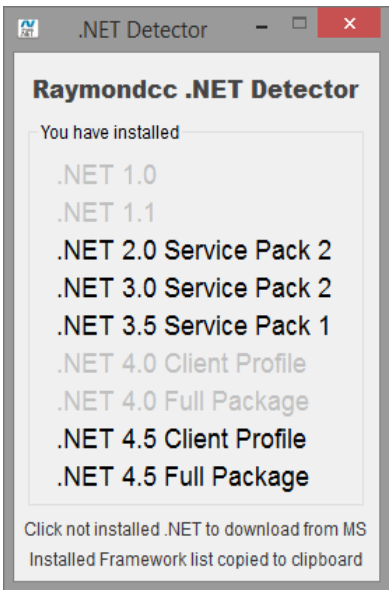
Note: when unpacking the zip file, take care of unpacking all the contents and to maintain the directory structure.

Although is suggested to do so, it is not needed to run DCSMP in the same computer where DCS is.

The only prerequisite for running DCSMP is to have the .NET Framework 4.5 installed which, in a reasonably updated system, should be already installed. If DCSMP refuses to start without any error you can check using Raymondcc .NET Detector which can be downloaded from:

https://www.raymond.cc/blog/download/did/1741/

If the tool reports .NET 4.5 Full Package (as shown below) the Framework is installed.



In case the Framework is not installed, you can download it here:

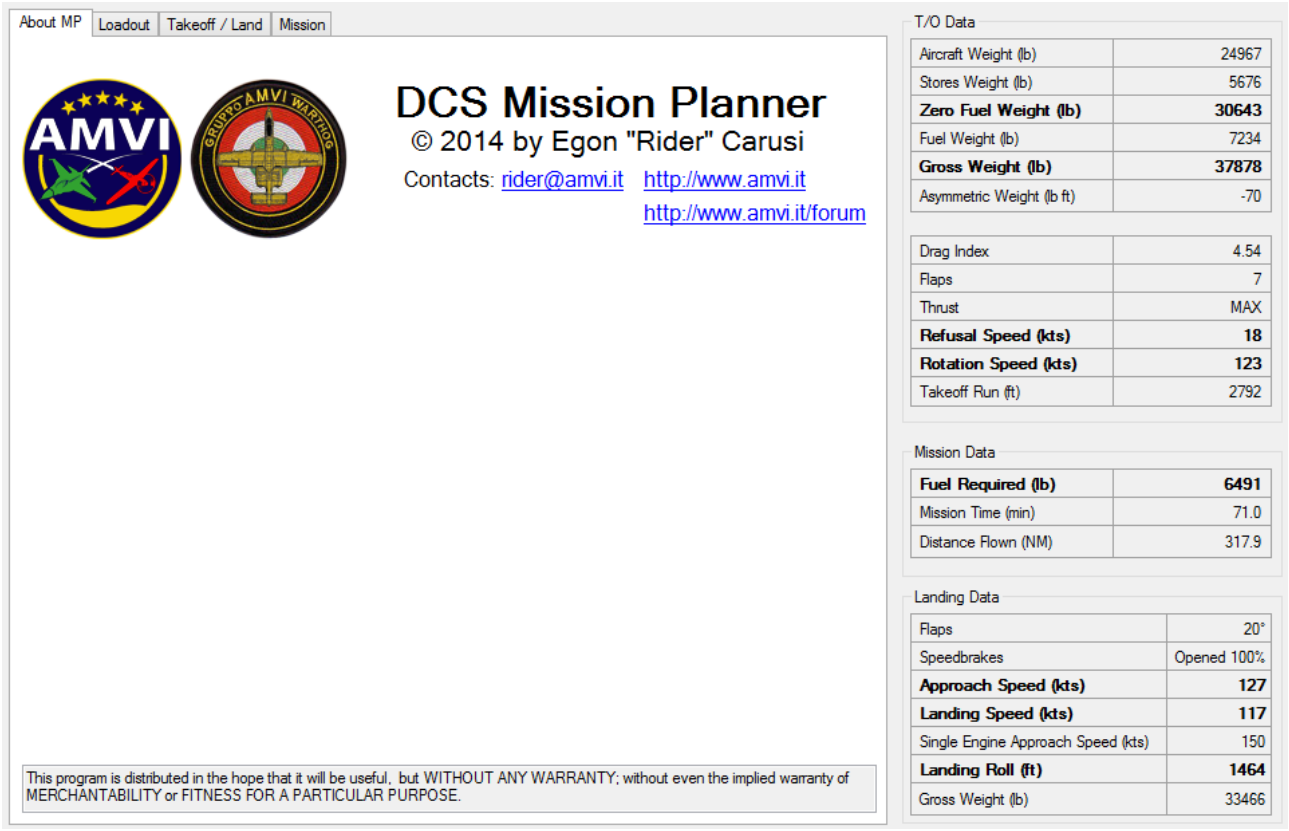
http://www.microsoft.com/en-US/download/details.aspx?id=30653

DCSMP

Technically speaking DCSMP is a simple C# application that implements a container of modules. Each module is an aircraft (not only, but keep it simple for now) that can be plugged into the core.

Although in this phase the plug-in mechanism is not yet complete and only the A10-C module is available, with a proper set of information, any other aircraft can be added with a small overhead.

The interface is very simple: an upper combo box to select the Aircraft Type (module) and a lower part that is reserved to the module.



The “core” of the application also provides the standard controls and functions to deal with units.

A10-C Module

This module helps the virtual A10-C pilot to plan its loadout and timing for the mission. The interface is divided into three functional tabs:

- Loadout
- Takeoff / Land
- Mission

All the calculations performed by this module are based on the performance data found in the TO 1A-10A-1-1 that have proven to be reliable enough for the A10-C modeled in DCS. Some details on weapons are derived directly from DCS and cross checked with other sources. All the data used to develop this module are freely available on the internet.

By design, any change in input data will reflect into the calculated values when leaving the input field (or by pressing Enter).

The right side of the window contains a summary of the most relevant data for the mission.

Takeoff:

- **Aircraft Weight**: weight of the aircraft in the clean configuration (no stores, no fuel). This is a constant value and reported there just for reference.
- **Stores Weight**: weight of the stores attached below hardpoints including GAU-8 ammunition.
- **Zero Fuel Weight**: weight of the aircraft without fuel. Equals to *Aircraft Weight* + *Stores Weight*. Usually called ZFW.
- **Fuel Weight**: weight of the fuel planned including external tanks.
- **Gross Weight**: weight of the aircraft in takeoff configuration. Equals to *Zero Fuel Weight* + *Fuel Weight*. Usually called GW.
- **Asymmetric Weight**: it's a measure of the asymmetry of aircraft loadout expressed as a roll

torque. Higher value means faster roll rate (with no input on the stick) at the time of takeoff. Positive values indicates right roll.

- **Flaps**: takeoff flaps configuration
- **Thrust**: takeoff thrust power applied.
- **Refusal speed**: speed at which is still possible to abort takeoff (see TO 1A-10A-1-1 for better definition).
- **Rotation speed:** speed at which the rotation should be started.
- **Takeoff Run:** length of the runway from brake release to airborne condition.

Mission:

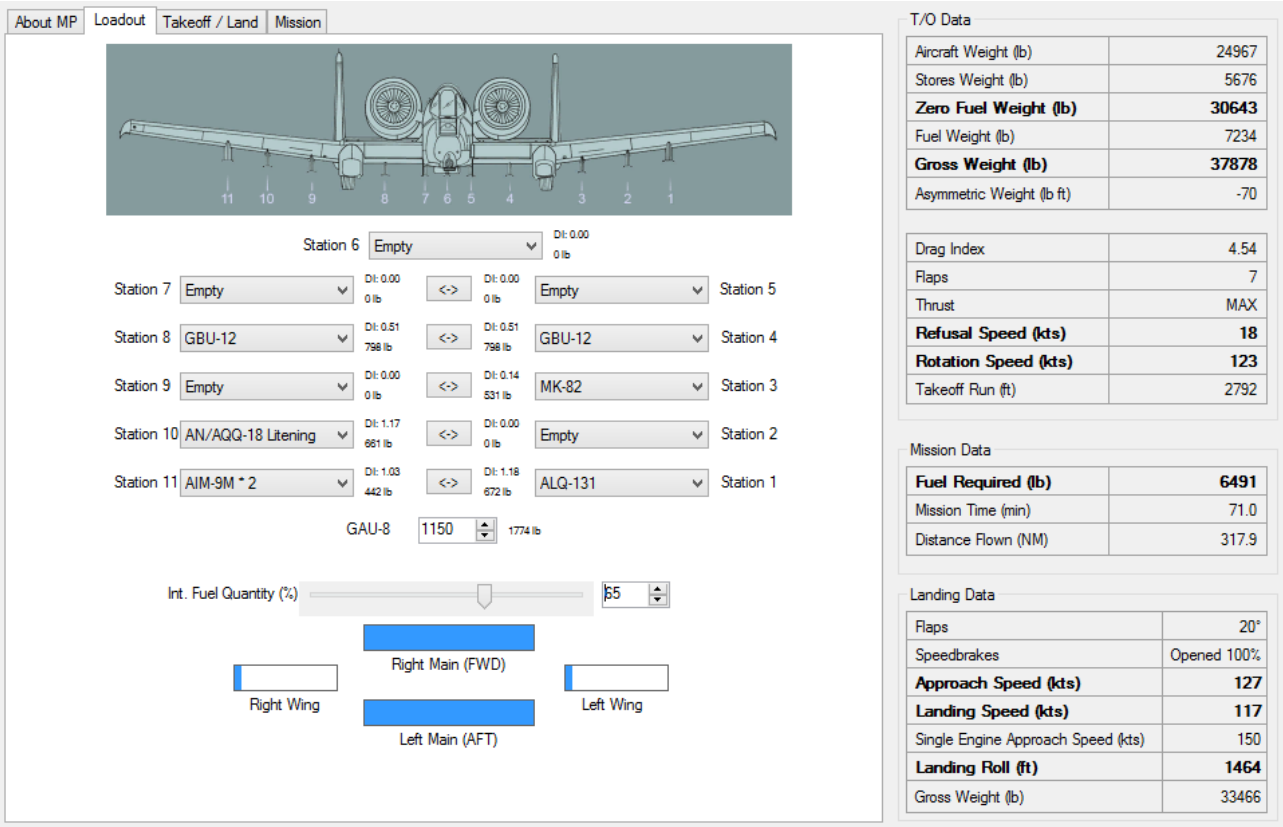
- **Fuel Required**: minimum amount of fuel required for the mission.
- **Mission Time**: mission expected flight time.
- **Distance Flown**: total distance flown during mission

Landing:

- **Flaps**: landing flaps configuration.
- **Speedbrakes:** speedbrakes configuration after touchdown.
- **Approach Speed**: suggested speed for the final approach phase.
- **Landing Speed**: suggested speed at touchdown.
- **Single Engine Approach Speed:** same as App. Speed in case of a single engine failure.
- **Landing Roll**: length of the runway from touchdown to full stop.
- **Gross Weight**: weight of the aircraft in landing configuration.

Loadout tab

The aircraft loadout is the beginning and the ending point of each planning.



Any information entered on this tab will influence the aircraft performance by means of weight and drag over the whole flight. While the stations loadout is usually determined by the mission, the fuel quantity is updated during the planning to optimize aircraft performance on critical mission actions (takeoff, land and attack).

Drag Index (DI) and Weight is shown beside each station.

The ↔ button is used to synchronize ordnance from left side box to the right side box.

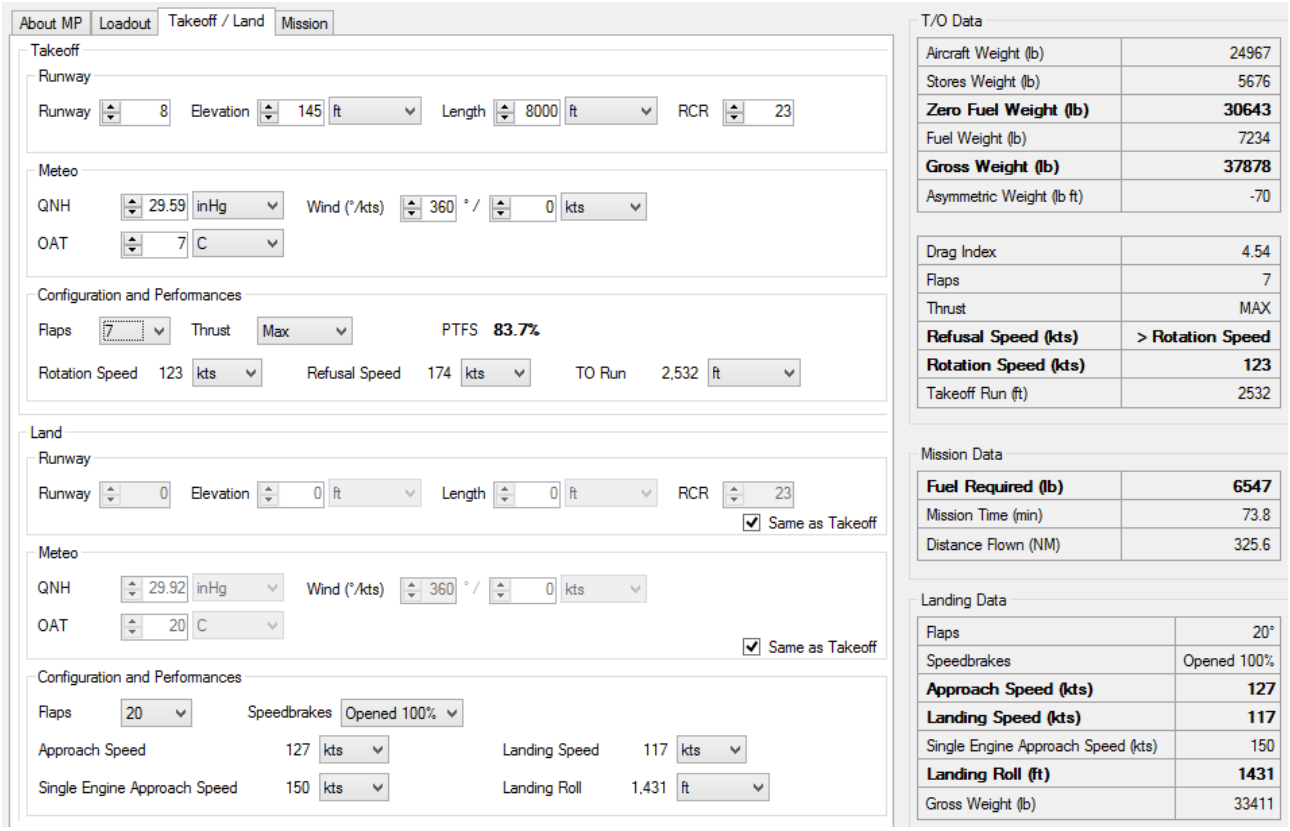
The fuel loadout, as required by DCS, is shown in % of the total internal capacity. Blue bars below will show the quantity loaded in each aircraft tank.

Note: the image shown on the upper part is taken directly form the simulator directory and that's the only reason for suggesting the use of DCSMP in the same PC where DCS has been installed.

Takeoff and Land

This tab used to enter runway, meteorological and aircraft information for both takeoff and landing.

Most of the data present in this tab can be entered (or read) in selectable units of measure to ease data entry (and interpretation). Conversion is applied on the fly.



The runway box permits to specify:

- **Runway**: runway in use (in form 0-36). This is used to calculate wind influence on takeoff/landing run.
- **Runway Elevation**: this parameter influences lift produced by wings and thrust produced by engines influencing takeoff/landing speed and run.
- **RCR** (Runway Condition Reading) is a standard index to measure runway grip. This determines the maximum breaking force that can be applied on wheels and influences the stopping run. During takeoff is used to calculate the refusal speed.

The meteo box permits to specify:

- **QNH**: barometric pressure adjusted at the sea level. This has the same scope of influence as the runway elevation.
- **Wind**: direction to and speed. This parameter, in conjunction with the runway in use, influences the takeoff/landing run.

Note: in the DCS mission editor the wind direction is indicated in “from” rather than usual “to” form.

- **OAT** (Outside Air Temperature): air temperature at the airfield. This field has the same scope of influence as the runway elevation.

Configuration and Performance (takeoff):

- **Flaps**: flaps position at takeoff, usually set at 7. Influences takeoff speed and run.
- **Thrust**: can be MAX or a derated (PTFS -3%). Influences takeoff run and refusal speed.
- **PTFS** (Predicted Takeoff Fan Speed): indication of engine thrust at takeoff based on the engine fan speed indicator. This field is a result.
- **Rotation Speed:** speed at which the rotation should be started. This field is a result.
- **Takeoff Run:** length of the runway from brake release to airborne condition. This field is a result.
- **Refusal Speed**: speed at which is still possible to abort takeoff (see TO 1A-10A-1-1 for better definition). This field is a result.

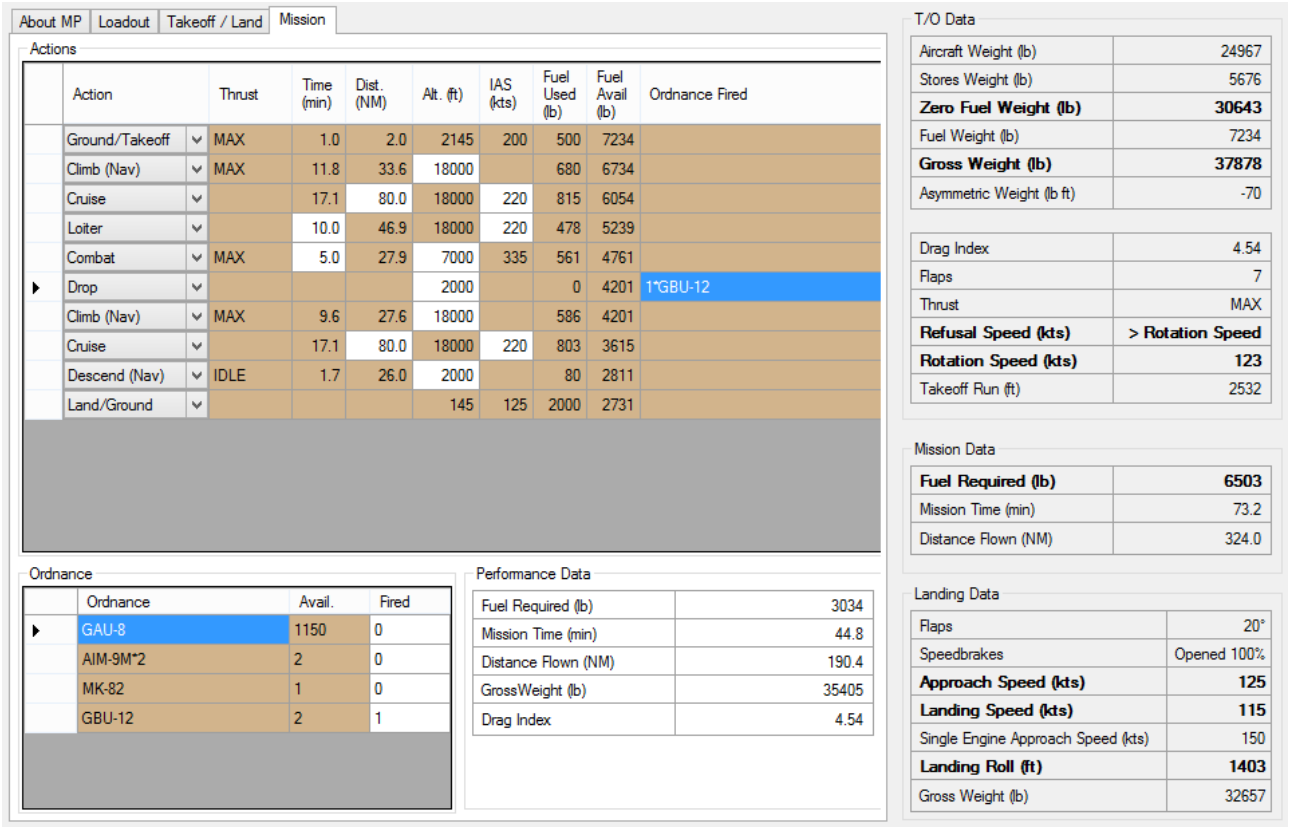
Configuration and Performance (land):

- **Flaps**: flaps position at takeoff, usually set at 20 (full). Influences landing speed and roll.
- **Speedbrakes:** speedbrakes configuration after touchdown. Influences landing roll.
- **Approach Speed**: suggested speed for the final approach phase. This field is a result.
- **Landing Speed**: suggested speed at touchdown. This field is a result.
- S**ingle Engine Approach Speed:** same as Approach Speed in case of a single engine failure. This field is a result.
- **Landing Roll**: length of the runway from touchdown to full stop. This field is a result.

Mission

The mission tab is the most complex one, it is composed by:

- Actions panel (top) on the upper part that is used to enter and summarize mission actions and the relevant data.
- Ordnance panel (bottom left) showing the ordnance availability and letting enter the number of weapons fired for *Drop* actions.
- A Performance panel (bottom right) summarizing some relevant flight information.



In *Actions* and *Ordnance* tab, data can be entered only in cells with white background. Cells with red background indicate a data error (a missing or out of range value).

Left mouse clicking an action row on the *Actions* panel to select it. The black triangle on the left side of the action name will move on the selected row and the *Ordnance* and *Performance* panel will update. Right mouse clicking an action row on the *Actions* panel to call the context menu which allows to insert or remove actions.

Actions

- **Ground / Takeoff**: this action starts on ground and take into account 1 minute of flight time to reach 2NM distance from runway at 200 kias.
- **Climb**: this action requires the destination altitude and automatically computes the time and distance at maximum thrust (and maximum climb performance). Suggested climb speeds by TO 1A-10A-1-1 are:

Pressure Altitude (~1000 ft)	IAS (kts)
SEA LEVEL	170
5	165
10	160
15	155
20	150
25	145

- **Cruise (Nav)**: distance and speed required. Navigation action in which the pilot is flying to the combat zone. No altitude variation are expected.
- **Loiter**: time and speed required. Usually used in CAS or non pre-planned missions. In this action the pilot is orbiting around a point and waiting for calls.
- **Combat**: time and final altitude required. In combat it is expected that the pilot is entering the combat zone reaching the initial attack altitude in a given amount of time.
- **Drop**: altitude required. In this action the pilot fires/drop ordnance on the target and leaves the area at a give altitude. This action is the only one that activates the *Fired* column on the *Ordnance* panel
- **Descend (Nav)**: final altitude required. Navigation action in which the pilot is descending at idle thrust to a given altitude usually for landing.
- **AAR**: time, speed and AAR fuel quantity required. This action is for air to air refueling, the fuel quantity indicates the total amount of fuel onboard when leaving the tanker.
- **Land/Ground**: no data required. This action takes into account a reserve of 2000lbs fuel.

Credits

I would like to thank:

- All the AMVI's staff for the work they do in supporting the (italian) flight simulation community: without their work simming could have been a lot less challenging!
- ED for their work on DCS and the impressive A-10C ... I hope to add more and more aircraft of the same quality and may the next be an F/A-18C :)
- Flora for letting me work at DCSMP in our free time … just like I'm doing now.

Special tanks, in chronological order, goes to my fellow pilots:

- Paolo “Catu” Catuogno and Roberto “Zakk” Aversano for actively supporting the idea of DCSMP.
- Marco “Jay” Usai, Fabio “Grifo” Cipri, Giambruno “Dragon” Piotto, Marco “Ichnus”, Michele “Desiez” and the other members of Gruppo Operativo Warthog (AMVI's A-10C virtual fighter group) who are testing the tool and providing suggestions.
- “Phant” for pointing my attention to some interesting sources of information.
- Guido “Gringo” Veneziano for the review of this guide.

Thanks to community members who provided relevant information:

- “Eddie” from 476th vFG for providing several corrections on the A-10C database

… and finally thanks to all the pilots I have forgot in the hurry of writing this final page!