

DCS Mirage 2000C - Overview

Known for their high-quality aircraft for Flight Simulator X, **Razbam Simulations** has entered the digital battleground of Digital Combat Simulator with their rendering of Dassault's Mirage 2000C.



The Mirage 2000C is a stylish aircraft – sleek and classy.

Un Fier Héritage

The French jokes will come — *c'est la vie* — but I hope the jokers out there who have always associated the French military with white flags will take a moment and do just a little research on **the contributions that the French have made to aviation**, i.e., there were a lot of **French aircraft** fighting in World War I; French companies helped bring major advances to aviation technology, e.g., **the Concorde, the Caravelle**, etc.; and France continues to advance aviation technology today, including their significant contributions to Airbus, which continues to be a major driving force in air transport today.



Téma les becs! Ouf!

Body of a Dancer, Soul of a Fighter

Dassault's Mirage 2000C is a beautiful aircraft. A pure delta-wing aircraft, the styling is sleek and smooth, the small strakes on the engine inlets exotic accents on an already elegant body. The fixed refueling probe is a jarring wart, jutting out like an afterthought or a twisted phallus — or perhaps both: "You want to me to put *what* on my airplane? Fine, it'll look like *this!*" — but the overall effect is a weapons platform aircraft that is both functional and sexy.

*Note: Don't bother looking for an earlier "A" variant of the M2000, there isn't one! The 2000C was the first produced 2000, where the "C" stands for chasseur (French for "hunter") a fitting name for this multirole aircraft. There are **several variants of the M2000**, including a B (a two-seat trainer), an N (for delivering nuclear weapons), and the -5 Mk2, which is the most up-to-date version of this delta-winged predator.*



The hills are alive with the sound of WHOOOOOSH!

The two circular inlets with adjusting shock cones on either side of the cockpit feed the one engine, a Snecma M53 afterburning turbofan. The fuel-efficient turbofan puts out 12,230 lbs of dry thrust, which leaps to 19,400 lbs when the afterburners kick in. Not bad for a fighter plane with a loaded weight of around 30,000 lb! This thrust to weight ratio is greater than the nimble MiG-21bis but doesn't quite reach the level of its intended competitor, the F-16.



"What could it be, it's a mirage, you're scheming on a thing, that's *sauvetage*!"



The delta wing's high angle-of-attack at low speeds means you need to really peek out over that nose on final.

The real magic of the M2000C is that delta wing. Delta wings create lots of lift at high angles of attack due to how air flows over the leading edges, making the aircraft they're attached to very maneuverable. They generally don't do so well at subsonic speeds, however, as delta-wings produce lots of drag at slower speeds. For a military fighter aircraft, however, high-speed maneuverability is a good tradeoff for poor subsonic performance.



Leading edge slats further improve high angle-of-attack performance.

To make things interesting, the M2000C was actually designed to be inherently unstable. Although this enables a much greater degree of maneuverability than a conventionally “marginally stable” aircraft, the M2000C’s advanced fly-by-wire (FBW) system is constantly working to keep the pointy end forward. All it takes is one flip of the FBW disable switch to really appreciate what the computer is doing. *Hint: don’t turn off the FBW system in flight.*

Internally, the M2000C is an advanced war machine. In addition to the high-tech FBW system handling the control surfaces, a central computer connects the inertial navigation system, air data computer, and the *Radar Doppler à Impulsions* (RDI) pulse-Doppler radar into an integrated combat package. Throw in a radar altimeter, radar warning receiver, and both a heads-up (*visualisation tête haute*) and a heads-down (*visualisation tête basse*) display, and you’ve got one heck of a good time on your hands.

To bring down its aerial prey, the M2000C has twin 30mm cannons (with 125 rounds each) nestled snugly under its chin, and its four underwing pylons can carry the Matra Super 530 semi-active radar homing missiles and Magic (and Magic II) infrared missiles. Although the M2000-5 can carry the more advanced *Missile d’interception, de combat, et d’autodéfense* (MICA), this missile is not available on our Hunter. The centerline pylon can carry fuel tanks or an Éclair ECM pod.



l'Arrivé!



Claquer!

In addition to the aerial weaponry, the M2000C is fully strike capable, as well: general purpose bombs (low and high drag), rocket pods, and cluster weapons as well as laser-guided Paveway weapons. There is no **1760 interface** on the M2000C, so don't expect to see JDAMs or other "smart" munitions hanging from underneath that delta wing.

But Is It a Good Module?

Enough about all the technical stuff, how is the module? To summarize: it's a good beta.

The module comes with a fully flyable M2000C — kind of important for a aircraft module — with *a mostly* clickable cockpit (there are a few items still in work). The air-to-air radar works at detecting and tracking targets, and both the air-to-air and air-to-ground weaponry does what they're supposed to do.

The flight model is good — that "on rails" feeling is typical for a fly-by-wire control system — but there are some concerns being voiced in the forums about some possible warts or remaining polish. It's not worth it to hash the details out here — this *is* an initial beta release, after all — but as of this writing there is nothing that destroys gameplay.



Derbysieger and I flying formation over Nevada.

The aircraft external and internal visuals are stunning and show that a lot of care was put into the details. Rivets, lines, labels, etc. The aircraft was originally made by **Metal2Mesh** for Flight Simulator X, so we all benefit from the love and care that has already been poured into this design.

This DCS M2000C module only works with **DCS World versions 1.5.2 and later** so be sure you've completed that update. I've tested the module in both the released 1.5.2 and the open-alpha 2.0 over Nevada and have not noticed any significant differences that isn't explained by the difference in DCS World versions themselves.

The module ships with a handful of liveries: French, Brazilian, Greek, UAE, and a very bold kitty cat paint job.







Razbam has also included a few accessories with their flying delta wing:

- R.550 Magic 2 all-aspect IR homing missile
- Super 530D medium range semi-active radar homing missile
- Mk-82 general purpose bomb (both low drag and snake-eye variants are available)
- Mk-20 Rockeye cluster bomb (hopefully just a temporary stand-in for the French **BLG-66 Belouga**)
- Matra Type 155 rocket pod (currently shoots Hydra rockets instead of SNEBs in this pre-release beta)
- GBU-12, and -16 laser guided bombs (Paveway II)
- GBU-24 laser guided bomb (Paveway III)
- AUF2 dual-store suspension adapter for some pylons
- Both 1300L centerline tank and 2000L wing tanks
- Smokewinders (*bleu, blanc, et rouge*)

As an American who has grown up with French jokes, I have to admit it's a little weird getting into a French war machine — where's the surrender button? hyuk hyuk — but the charming European interior belies the fierceness of this hunter. Plus, it's always a thrill to fly and fight an aircraft in its native tongue. If you can remember that "**gauche**" means left, "**droite**" means right, "**marche**" means on, and "**arrêt**" means off, you can almost just guess the rest of it. If you're absolutely opposed to learning any French at all, the tooltips are in English, so you should still be able to figure out how to make the thingy do the thingy.

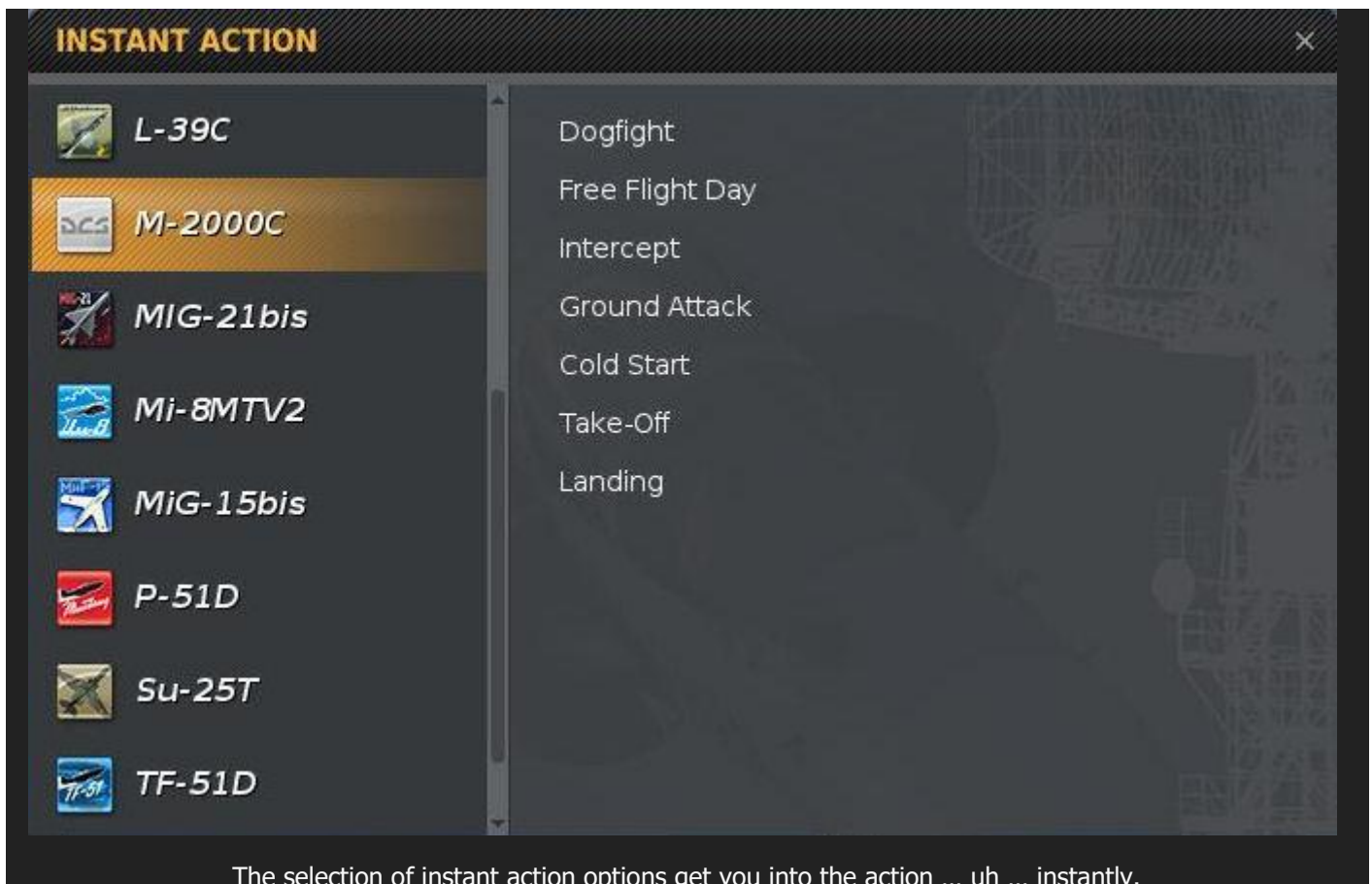


There

are still a few chunks of the module that aren't finished yet — switches that don't switch, buttons that don't button, systems that don't system — but Razbam has been very upfront about what's not completed, which I take to mean that they plan on continuing to update the systems modeling before the module is officially released.

There are also some occasional in-game bugs — switches and settings holding over between missions, occasionally odd HUD displays, etc. — but there are always bugs in newly released products, and, as I mentioned before, there aren't any rage-quit-worthy issues.

No campaigns ship with the module, and there aren't any training missions either, although I suspect we'll see these once the product is delivered. Is it too much to hope for a good campaign too? Possibly, but *je croise les doigts!*



The selection of instant action options get you into the action ... uh ... instantly.

As of the initial beta release, there are six single-player missions for the M2000C in DCS World 1.5.2 (none in DCS World 2.0), each with an air-to-air theme (see the screenshot above), and seven instant action missions: Dogfight, Free Flight Day, Intercept, Ground Attack, Cold Start, Take-Off, and Landing.

What's In The Doc, Doc?

The manual is an inspiring 164 pages, with good pics and information about the complex systems on this hunter, including detailed images and descriptions of the HOTAS, instrument panels, fuel system, HUD displays, radar, and weapon systems. I'm always happy to see a hefty manual with lots of good reading material and the M2000C manual doesn't disappoint. There are currently a few "not available in open beta" or "will be described upon final release" placeholders, but there's still plenty of data to pore over.

Radar Display



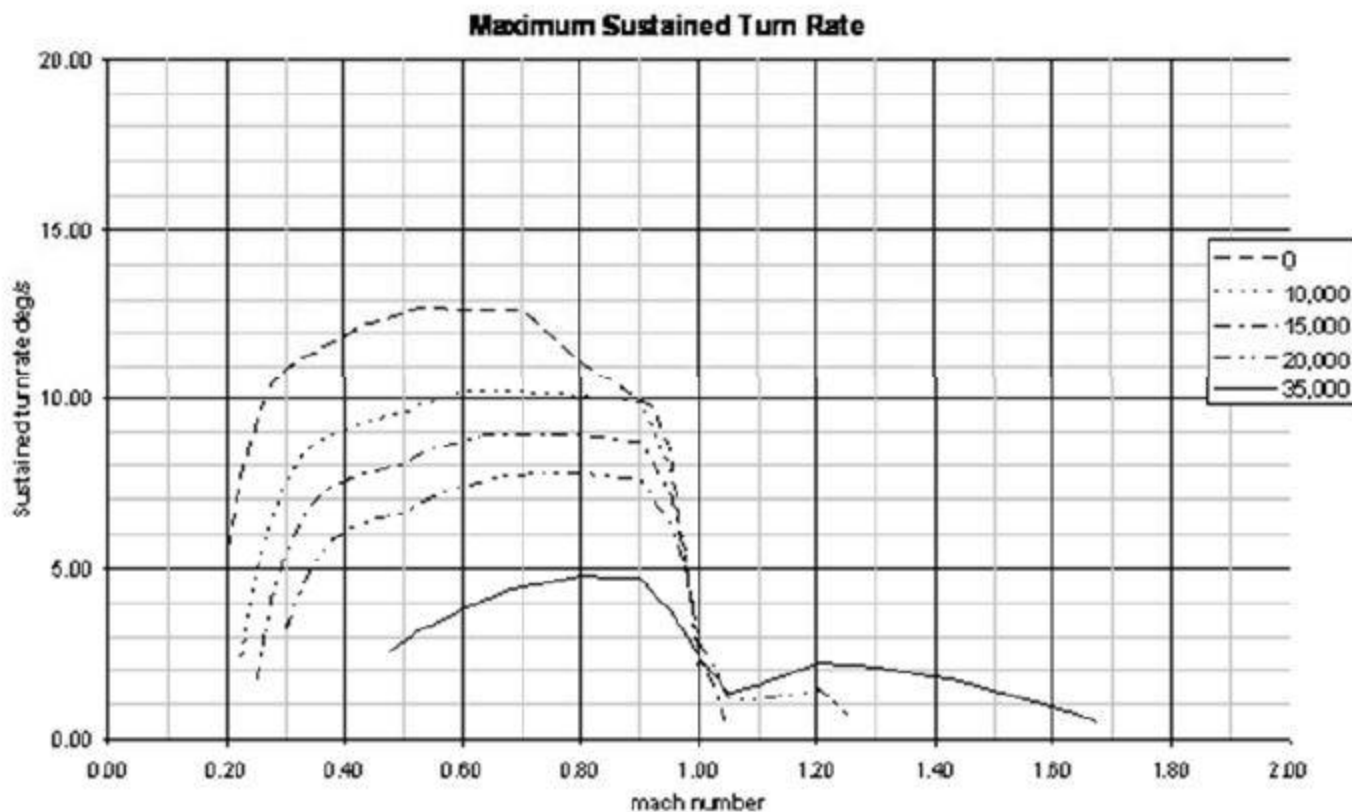
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|----------------------------------|-----------------------------------|
| 1.) Target Information | 7.) Aircraft Heading Compass |
| 2.) Objective Designation (Left) | 8.) Aircraft Altitude |
| 3.) Aircraft Pitch Scale | 9.) Objective Designation (Right) |
| 4.) Aircraft Symbology | 10.) Antenna Direction |
| 5.) Azimuth Angle Guides | 11.) TDC |
| 6.) Aircraft Airspeed | 12.) Range |

Ah...satisfying details...

There are some important details scattered throughout the manual that will save you some frustration — such as the part in the weapons system section where it says not to mix too many weapon types on the same load or the fire control computer will get confused — e.g., trying to carry bombs, rockets, and air-to-air missiles will leave you unable to drop any bombs. *Va faire tes devoirs!*

*Heads up to the fellow checklist followers out there: the preflight checklist in the manual is missing at least one crucial step: the main battery, transformer, and alternator switches must be flipped from **arrêt** to **marche** during the start up sequence. Do this before running through the Preflight Checklist, and the rest of the procedure should be smooth.*

A good third of the manual are performance charts which, in a move that confuses this virtual pilot, do not represent either the real-life M2000C or the DCS World implementation. Instead, the developer has chosen to publish performance charts for the the Falcon 4.0/BMS representation of several variants of the M2000 (C, D, and 5F).



From the DCS M-2000C flight manual.

While the flight-model coder for the DCS World Mi2000C may have used these charts or similar source material as Falcon 4.0/BMS to help develop their flight model, it's not exactly a safe bet to say the models will be equal without a LOT of extra verification and validation work. I hope that we'll see either updated charts for the DCS World M2000C, or some verification data that shows the charts are valid for use.

Conclusion

Razbam's DCS M2000C module is a beta product and it shows. It's a good beta, definitely flyable and enjoyable in both free flight and combat, and free of any gameplay killing bugs. Fans of *le chasseur* should be pleased with the level of quality of the module while there will be rivet counters out there disappointed with the number of systems not yet plumbed in yet. *À chacun son goût.*

As I write this, **the beta version of the M2000C module** is selling for \$59.99 US, which is a fair price for a DCS module, especially given the level of complexity and detail that the M2000C promises, but those who prefer to have a more finished product might want until the rest of the module is polished.

Ne faire pas le poireau, mes potes! C'est parti!



chasseur est arrivé.

Le