

TRYING TO FLY THE FABULOUS BOMBARDIER CANADAIR

CRJ

MSFX SIMULATION

by
Captain Mike Ray



One of the truly popular modern jet airliners is the Bombardier Canadair CRJ series. The CRJ is the first jet experience for some simmers and a lot of airline pilots cut their teeth on this fabulous "little jet" as a lead-on to the "BIG" jets. But don't be misled, this little rascal is as complex and difficult to understand as any Boeing or Airbus. Simmers are indeed fortunate, since there is a great simulation available for MSFS-2004 and MSFX. I thought that it would be interesting to try our hand at operating this complex, but fun bird to fly. The simulation we will be using for this demonstration is the Wilco Fleet CRJ created by the team at Feelthere.com. I can't fully describe all the intricacies of the actual airplane in an article like this, but probably the most frustrating and confusing part of the whole flight evolution is the CDU setup, so we will take a look at that specific evolution.

If you attempt to try to compare the FMS/CDU of the CRJ with a Boeing or Airbus set-up ... it simply won't work. You may be an ace Bus driver or a Boeing veteran, but there is very little carry-over to this little hot-rod's FMS/CDU. So, that being said, let's look at the somewhat complex preliminary CDU set-up on the CRJ and see if we can't get this flashy regional jet to fly.

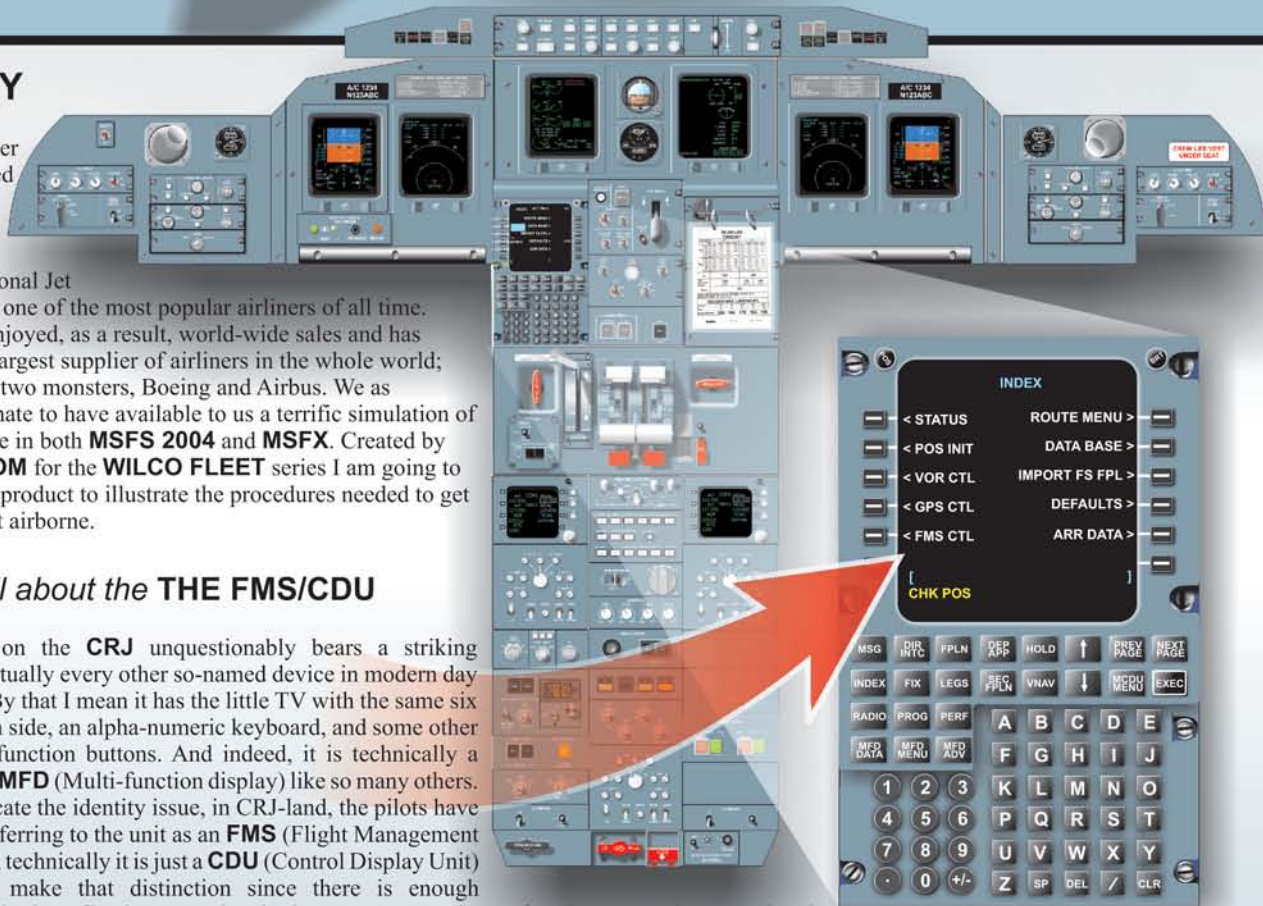
GET READY FOR SOME FUN!

HISTORY

In 1986 Bombardier Aerospace acquired the CRJ design from Canadair. Since that time, the Canadair Regional Jet series has become one of the most popular airliners of all time. Bombardier has enjoyed, as a result, world-wide sales and has become the third largest supplier of airliners in the whole world; only behind those two monsters, Boeing and Airbus. We as simmers are fortunate to have available to us a terrific simulation of this jet masterpiece in both **MSFS 2004** and **MSFX**. Created by **FEELTHERE.COM** for the **WILCO FLEET** series I am going to use this particular product to illustrate the procedures needed to get this flashy little jet airborne.

It's all about the THE FMS/CDU

The **FMS/CDU** on the **CRJ** unquestionably bears a striking resemblance to virtually every other so-named device in modern day "glass" aviation. By that I mean it has the little TV with the same six buttons along each side, an alpha-numeric keyboard, and some other strangely named function buttons. And indeed, it is technically a common ordinary **MFD** (Multi-function display) like so many others. To further complicate the identity issue, in CRJ-land, the pilots have the odd habit of referring to the unit as an **FMS** (Flight Management System); however, technically it is just a **CDU** (Control Display Unit) for the **FMS**. I make that distinction since there is enough contradictory terminology floating around and I don't want you to be confused anymore than you already are. Boeing **CDU**, Airbus **MCDU**, and CRJ **FMS** ... all refer to the same instrument ... the Control Display unit. Some of the advanced versions of the CRJ (such as the CRJ-900) will have two CDU units; however, the dash 200 sports only one **FMS/CDU** unit ... which leaves a nice blank spot in which to place the speed card ... or a grocery list.



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We are specifically going to be describing a very sophisticated and realistic CRJ flight simulation created by Vic Racz and the wizards who work at a place called "Feel There" (www.feelthere.com) and marketed by Wilco Fleet (www.wilcopub.com). If you are flying one of the "default" airplanes that come with the MSFX (and MSFS 2004) package, then unfortunately much of this tutorial-style article simply will not apply to your simulation. I will try, however, to make the application so similar to the operational requirements of the real airplane so that no matter what simulation or flight sim program you are using; whether the X-Plane or MSFX or any other flight simulation program; as long as that simulation accurately reflects operation of the "real" airplane, this stuff will work.

That being said, however, I think we all realize that a simulation is NOT a real airplane and there are some things that are uniquely flight simulator commands, such as QWERTY keystrokes, mouse overs, scroll wheels and the like.



The first monitor view you should be seeing when you initially open up the Wilco simulation will be the cockpit. The jet will be sitting on the take-off end of the runway with the engines running.

During the course of operating the simulation, we will be referring to some of the ancillary or supplemental systems on the jet. Things such as gear and flaps. I will simply use the MSFX commands and not discuss those systems in detail.

However, depending on the level of reality you wish to incorporate into your individual flight experience, there are included in the simulation operating systems that are replicated with great detail. For example, there are radios to tune and seat belt signs to actuate. You can extend the spoilers and turn on/off the lights. The actual depth of this terrific simulation is "pretty good". However, we simply can't discuss all these systems in this short article

So, for the sake of brevity we are going to restrict our discussion to a rather simplistic view of the CRJ operation and to confine ourselves to the limits imposed by the magazine article format ... we will only talk about how to "get the jet airborne" in a simple format.



SIX TOOLS NEEDED TO FLY THIS JET

To operate this little rascal I have identified six specific instruments that you need to understand in order to utilize the FMS and automated flight options and fly like a real airline pilot. Four of them will be visible on this initial screen start-up:

1. **PFD** (Primary Flight Display)
2. **MFD** (Multi-Function Display)
3. **EICAS** (Primary display)
4. **FCP** (Flight Control Panel)

The next 2 items require a "call up" command:

5. **DCP** (Display Control Panel).

The command **SHIFT-4** will bring this to the screen.

6. **FMS** (Flight Management System **CDU**).

Use **SHIFT-2** for the **FMS/CDU**.



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This screen-shot shows one of the shortcomings of the single screen simulator visual capability ... even though the developers have thoughtfully placed the images on the screen so that they minimally encroach onto the real estate of the other images ... there is still "crowding". However, the genius of the sim visual interface design is that even with all six instruments displayed, you can still see all the relevant information on all the displays. Here is where a two monitor (or multi-screen) set-up would be truly delicious, though.

Here is a suggested solution to the problem; and this is what I try to do. Declutter the screen by de-selecting the images of the **FMS/CDU** and the **DCP** and have them displayed ONLY when they are being used.

Of course, a simple solution is to leave the whole cockpit set-up as they designed it for your initial operating experience ... and as you become more familiar with the way things operate, you can declutter pieces of the cockpit display as desired.

Screenshots used by permission of Wilco and Feelthere

Ordinarily, when I operate a modern glass-style **EFIS** controlled flight simulation, the very first thing I do is program the Flight Management Computer control display unit (**FMC/CDU**). However, on the **CRJ**, I find that it is useful to begin the set-up with the **DCP** (Display Control Panel). The **DCP** can be displayed on your computer monitor by using the QWERTY command **SHIFT-4**.

THERE ARE THREE THINGS TO DO ON THE DCP.

1. Select the **NAV SOURCE** to **FMS**. You do that by depressing the **NAV SOURCE** button 2 mouse clicks. Observe that the **PFD** changes to a "WHITE FMS" indication.
2. Change the range scale to 40 miles. You do that by selecting the **RANGE SCALE** button 2 mouse PLUS clicks and observing the range scale change on the **MFD**.
3. Set the speed selector knob to **VSPDS** and observe the **PFD** displaying the **V** speeds.

We are doing these items on the **DCP** first so that when we are loading the **FMS**, we will be able to observe the indications on the **PFD** and **MFD** as we load them. Later, as you get more proficient in the operation of the sim, you will be able to develop your own set of flows and do things differently.

In the "real" world, of course, the pilots adhere to a rigid set of criteria and established protocols that ensure that everything is completed and checked. I just want you to understand that I am not trying to be "sloppy" but rather presenting an expedient and quick way to get the simulation up and running with the least amount of fuss.



BEFORE WE GO ANY FURTHER ... HERE IS A CRJ ... ASTOUNDING FACT! MOST CRJs DO NOT HAVE AUTO THRUST.

That means that there is **NO TOGA** or **VNAV AUTO-THRUST** on most models of the CRJ ... and even though "some" -900s have a rudimentary auto-thrust, for the sake of simplicity we will NOT discuss the -900 differences.

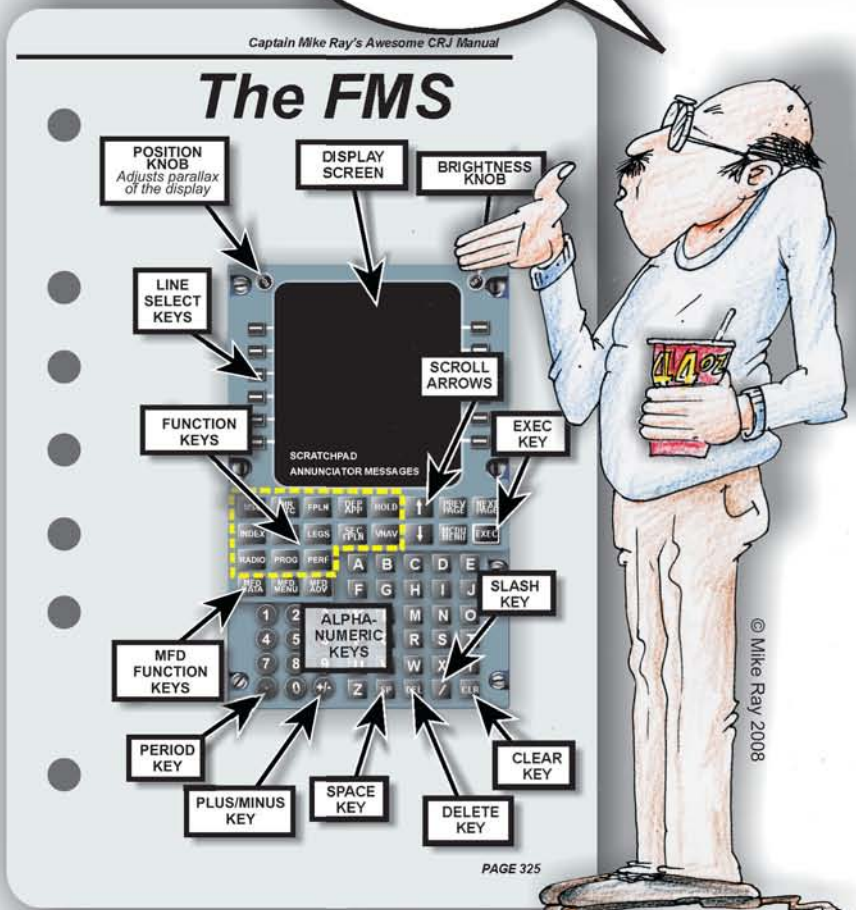
THEREFORE All thrust lever adjustments MUST be made manually.

Some of you Boeing and Airbus guys will simply have to get over the shock of controlling the thrust by hand ... **PUSH UP IF SLOW AND PULL BACK IF FAST** ... in order to maintain appropriate airspeed control.

RECOMMENDATION

Get a stick with a thrust control ... **DO NOT** try and fly this bird using the QWERTY keyboard ... it gets ugly quick!

Of course, the CRJ can easily be flown without using any of the automated functions for navigation or flight controls. It is entirely capable of operating like any jurassic jet. However, I submit to you that the real challenge of CRJ flying is in creating a point-to-point flight profile and completing it with the precision and skill that only the use of the automation can produce. Therefore, we are going to introduce the rather complex and intimidating **FMS/CDU**. I already hear some sim pilots moaning and whining loudly as they try to work around a proper **FMS** loading ... but to do this evolution properly, you **MUST** load the **FMS** completely before **EVERY FLIGHT**. Come on ... get a grip! This is supposed to be fun!



The first thing we need to do is accumulate some necessary trip data, since any point-to-point flight segment will involve several pieces of essential information to complete the **FMS** set-up. Let me just create a virtual "trip" out of thin air and supply the information that we will be using. Let's go from ...Ooooh, ...let's choose Paris, France (**LFPG**) and go to London, England (**EGLL**). Sounds like a nice trip to me.

I got the following routing from **MSFX** flight planner I see a routing of **LFPG.CGN.DPE.SFD.BIG.EGLL** is listed and recommends an altitude of **26,000 feet**.

I have also put onboard (using the **MSFX** fueling and payload function) **80%** in each main tank. I have grabbed **26 passengers** and **1500 pounds** of baggage out of thin air.

LOAD 5 FMS PAGES

- A. POSIT INIT
- B. FPLN
- C. DEP/ARR
- D. PERF INIT
- E. THRUST LIMIT

FIRST WE HAVE TO GET THE FMS/CDU DISPLAYED!

To do that ... **SHIFT-2**. The Push the **INDEX** key. This will reveal ..."**TA-TA**" ... the **INDEX** page.

I think that for the sim set-up, it is somewhat confusing just to follow the prompts and fill in the boxes. Select the **POS INIT** page. We are NOT going to follow a "real" set-up, but merely do a cursory set-up in order to get the sim up and flying in short order.

1. Select the **POS INIT** page,
2. Select the **FMS** position to the scratchpad and then
3. Select **SET POS** to align the **FMS**.
4. Move to the next venue by selecting **FPLN** (4).
5. Type the departure airport (**LFPG**) into the scratchpad and then Line select and fill in the **ORIGIN**. Do that for the destination (**EGLL**) and put it in the **DEST** entry.

6. write to scratchpad and then Line select the first flight planned waypoint (**CGN**) to the entry line labeled **TO**.
7. If you get a **MULTIPLE NAVAIDS** page (such as we have here), select the correct waypoint. That will return you to the **FPLN** or use the **NEXT** page key and fill in the rest of the flight planned waypoints.
8. Once that is complete, depress the **EXEC** key.
9. select the **DEP/ARR** key to display the available runways and **LINE SELECT** the departure runway.
10. Select the **PERF** key, and then the **PERF INIT** prompt, and that should put you on the **ACT PERF INIT** page. Fill in the entries for number of passengers, weight of cargo, cruise altitude.

It won't be necessary to address the **VNAV SETUP** page. The default settings are adequate. For the purists out there, however, the transition altitude for Paris is 4000 feet ... and you can enter that on the **VNAV** page.

11. Select the **PERF** key and then the **THRUST LIMIT** prompt. Place a temperature in the **OAT** entry. This will cause a "**TIC**" mark to be placed on the **EICAS PRIMARY** display indicating the setting for **TAKE-OFF** power.

LET'S GET THIS LITTLE RASCAL AIRBORNE

There is one annoying item that must be attended to on this particular simulation before we do the "important" stuff ... and that is to shut off that flashing **WARNING LIGHT** and the attendant yellow **YAW DAMPER** warning on the **EICAS**. We do that by selecting **SHIFT-3** and selecting the **YAW DAMPER** switch on the lower console that is displayed.



Select the **FD** switch on the **FCP** and observe the two selector lights on.

Select the desired **ALTITUDE** on the **FCP** using the **ALT** knob. Observe the altitude annunciated on the **PFD**.

Lower the flaps to **20** degrees. Tap the **F7** key on the **QWERTY 2** times and observe the flap indicator of the **PRIMARY EICAS**.

Select **RUNWAY HEADING** with the **HDG** selector knob and observe the **HEADING INDICATOR** of the **PFD** and **MFD** slew to that heading.

5 EASY SET-UP STEPS

Here are five simplified set-up steps that I will suggest in this article ... not definitive by any means, but useful for a quick-and-dirty method of getting this jet airborne. Some of you CRJ ace-sim pilots will quickly see limitations of this bare-bones skeleton technique ... and I encourage you to flesh out your own set-up as you continue to get more and more familiar with the operation. But for this discussion today:

1. **Yaw Damper ... ON.**
2. **Flight Director (FD) ... ON.**
3. **Select desired ALTITUDE.**
4. **Lower FLAPS.**
5. **Select RUNWAY HEADING.**

The rest of the flight evolution is beyond the scope of this simple, short magazine article. However, let me quickly supply a list of items that will get you on your way:

- Push the thrust levers forward so that the thrust indicators on the **PRIMARY EICAS** match the "tic" marks.
- Release the **BRAKES** (push the "." period).
- At **VR**, rotate to about **15 DEGREES**.

Use the pitch indicator of the **FD** (Flight Director) for guidance.

- **GEAR UP**
- **FLAPS UP**
- Engage the Auto-pilot (**AP ENG**)
- and so on and so forth.

This is by no means the end of the list of challenges you will encounter in flying this nifty jet airplane ... but alas, we are out of article space.

Happy simming,
Captain Mike Ray

CAPTAIN MIKE RAY'S Airplane lover's website www.utm.com



Simmers want the straight gouge on how to fly the **BIG JETS** just like the "real" airline guys ... and Captain Mike Ray writes books that tell them all the secret stuff. The books are interesting and fun to read ... and filled with those graphics and drawings and explanations that make the difficult ... well ... almost easy.

So, come on over and visit Mike's website for lots of free stuff ... and an on-line store where you can purchase his books.



WOW!

Com'on over and visit ...

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