

# How to configure a new airplane for FSCaptain

## Configuration files, load maps, and gauges

### 1. Introduction

The purpose of this document is to explain how to configure an airplane from scratch so that it works *perfectly* with FSCaptain. However, a few things should be mentioned before we get into the details:

- Almost all FS9/FSX/P3D airplanes work to some extent with FSCaptain, even if you don't configure anything. However, you may miss some of the more intricate details, such as accurate payload (which plays a role in the economic model), de-icing switches (which are needed for the weather hazard package), or accurate fuel estimates.
- The FSCaptain Team tries to support all planes that any of the team members own, but naturally there will be planes that we miss. This guide will explain how to get the most out of these unsupported planes.
- Because many airplane developers use custom code for their model, it is possible that FSCaptain might not work with a specific plane. While we cannot guarantee that all planes will work perfectly, practically all will do. The toughest planes so far were the Majestic Dash 8 Q400 and the FSLabs A320, but even those beautiful planes now works flawlessly with FSCaptain.

In this document you will learn how to

- Set up a configuration file for a given airplane
- Configure FSCaptain to use an airplane in "Economic mode"
- Create a load map for your plane
- Find the LVARs necessary to have all switches supported by FSCaptain

Subsequent revisions to this document will go into other configuration areas such as "Overrides" but for now we've chosen to start with the basics – a type-based aircraft configuration file, passenger & cargo Load Maps, and some interface data.

As an example, we have picked an excellent freeware plane that has originally been developed for FS9 but is also available for FSX (its VC click-spots do not work in P3D2+): the **Hawker Siddeley HS748** by Rick Piper, Fraser McKay, Brian Horsey, Brian Withers and Garry Russell. We assume that you are familiar with how to install a new airplane into your sim (if not, you may find a guide at <http://simviation.com/fsxaircraftinstall.htm> ).

This real world aircraft first flew in 1960 and a handful still fly in remote areas of the world today, delivering passengers and cargo alike.

**Please Note:** Our Flight Sim HS748 aircraft already has a configuration file, a load map, and all of its switches are supported by FSCaptain – so you don't have to do anything. This document is only a *guide to demonstrate how easy it is to have a new aircraft work well with FSCaptain*. Think of it as a history of how we made this aircraft fully FSCaptain compatible!

So before getting started with the FSCaptain configuration you should:

- Download the airplane and the modified panel sets from [http://www.cbfsim.co.uk/cbfs\\_lib/thumbnails.php?album=18](http://www.cbfsim.co.uk/cbfs_lib/thumbnails.php?album=18) (note: you will need to click twice on the zip drive symbol to start your download)
- Follow the installation instructions and install both packages to your simulator
- Test that the airplane works on your system – make a quick flight

Ready? Then let's start with the configuration.

## 2. Getting the plane to show up in FSCaptain Flight Dispatch

There are several ways to perform this, but the quickest one is to allow the FCDU to auto-generate an aircraft configuration file for you.

When you test the HS748 in your sim, *also start the FSCaptain FCDU* in either offline or login mode. This will create a file A748.cfg in the \FSCaptain\Aircraft\ folder.

```

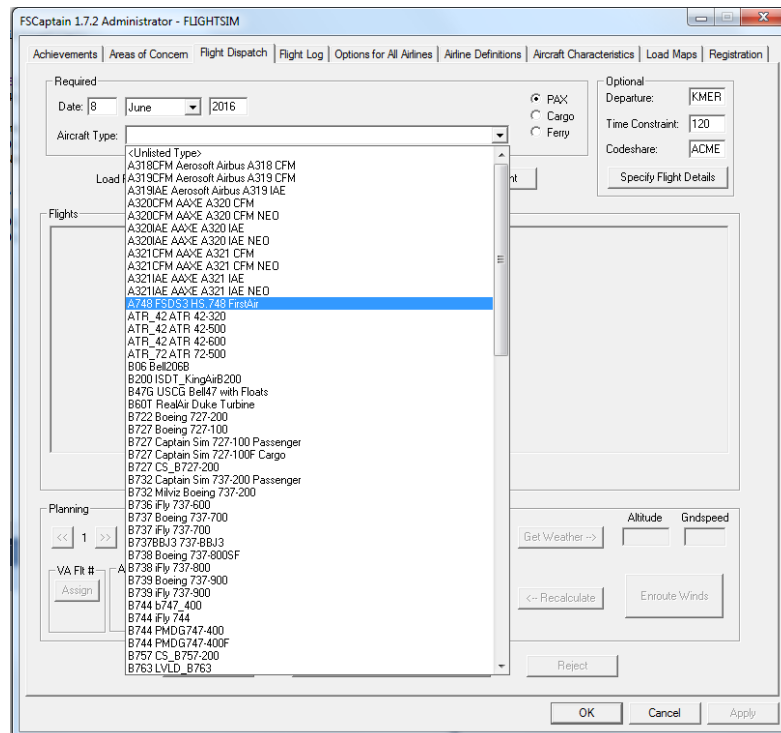
9                               Notice                               1/1
29NOV15                        19:20Z

  This aircraft type: 'A748'
  is not configured in the database.
  A default configuration file:
  'A748.cfg'
  has been created in the folder:
  FSCaptain\Aircraft
  It is recommended that you review
  and edit this configuration using
  the FSCaptain Administrator program.

                                PROCEED>

```

Now close your sim and the FCDU and open the Administrator, go to Flight Dispatch, and click on Aircraft Type. You should see something like:



Search for a plane with “HS748” in its name. In the figure above, this plane is called “A748 FSDS3 HS748 FirstAir”. This is the plane that we checked out in the sim and in the FCDU. If you had selected a different livery when you were in the simulator, then the ‘Airline Name’ would be different.

The most important part of the airplane name is the first *designator*, **A748**. This stands for the *type of aircraft*, which is determined from the line...

**atc\_model=A748**

... in the **[General]** section of your simulator’s file `\SimObjects\Airplanes\FSDS3 HS.748\aircraft.cfg`.

### Economic Mode Tip

Once the plane is visible in a non-Economic mode airline, we can make the plane also appear for an airline that uses the Economic mode.

Let’s assume this airline will be Alitalia. Now:

- Use Notepad.exe to open the file `\FSCaptain\Airlines\Alitalia Aircraft.cfg`
- Add the line...  
**Aircraft=A748\*,600.00,28.00,1,500.00**
- ... to that file (if you add it at the end, make sure to hit enter before saving the file so that there is an empty line at the end of the file). The details of this line are of no concern here, except for the fact that it contains **Aircraft=A748,\***

You should now be able to see this aircraft in the Flight Dispatch list when using Alitalia as the current airline in the Administrator.

## 3. Improving the aircraft configuration in FSCaptain

When creating the file `A748.cfg`, FSCaptain makes an educated guess about the performance of that plane. However, it does not have a database of all planes ever built, so this guess may not be perfectly accurate. The consequences for accuracy depend on how you use FSCaptain.

If you use an external program such as AivlaSoft EFB, PFPX, ProATC/X, or Simbrief.com for your flight planning, then you may hardly notice the difference between an accurate and inaccurate airplane configuration. Simply ignore the fuel estimate and payload that FSCaptain provides and you should be fine.

Of course, this is not what FSCaptain has been designed for, so if you want to use the FSCaptain dispatch release, then chances are that your payload may exceed the maximum payload of your plane, or fuel and travel time estimate may be off by a significant amount.

To get accurate numbers, you can consult the documentation coming with the plane or the Internet. To see what numbers you will need, open the Administrator, go to Aircraft Characteristics and select the file `A748.cfg`.

You should then see something like this:

The screenshot shows the FSCaptain 1.7.3 Administrator - FLIGHTSIM window. The 'Aircraft Characteristics' tab is selected. The aircraft name is 'A748' and the model is 'FSDS3 HS748 FirstAir'. The configuration is set to 'Small (e.g. C208)'. Performance values include Cruise Altitude (10000 FT), Max Headwind (50 KT), Climb Speed (116 KT), Cruise Speed (233 KT), Descent Speed (174 KT), Climb Rate (700 FPM), and Reliability (98.4%). The Fuel System is set to 'Jet A' with a capacity of 11587 LB. The Crew & Duties section shows 'Has a First Officer' and 'Cabin Crew' set to 0. The INOP Aircraft System Signals section is also visible.

Section	Parameter	Value	
Performance	Cruise Altitude (FT)	10000	
	Max. Headwind (KT)	50	
	Climb Speed (KT)	116	
	Cruise Speed (KT)	233	
	Descent Speed (KT)	174	
	Climb Rate (FPM)	700	
	Reliability (%%.%)	98.4	
	Fuel System	Fuel Type	Jet A
		Fuel Capacity (LB)	11587
		Minimum Fuel (LB)	0
Fuel Flow CLB (PPH)		2160	
Fuel Flow CRZ (PPH)		1080	
Crew & Duties	Has a First Officer	<input checked="" type="checkbox"/>	
	Cabin Crew	0	
	Disable FO Callouts	<input type="checkbox"/> Takeoff <input type="checkbox"/> Cleanup <input type="checkbox"/> Rollout	
	Disable FA Announcements	<input type="checkbox"/> Preflight <input type="checkbox"/> Inflight <input type="checkbox"/> Postflight	
	Cabin Service Alt. (FT)	2000	
INOP Aircraft System Signals	Battery	<input type="checkbox"/>	
	Autopilot	<input type="checkbox"/>	
	Exits	<input type="checkbox"/>	
	Engine Anti-ice	<input type="checkbox"/>	
	Parking Brakes	<input type="checkbox"/>	
	Ignition	<input type="checkbox"/>	
	Baro Altimeter	<input type="checkbox"/>	
	Flaps	<input type="checkbox"/>	
	Structural Anti-ice	<input type="checkbox"/>	
	Pressurization	<input type="checkbox"/>	

Now we have to make sure that all the numbers are correct, and we can see some that clearly aren't (this is not a small aircraft, it can fly well above 10000ft, and we do need a first officer & some cabin crew). FSCaptain tries to get as much as possible out of the airplane model files and the simulator, but it will never be able to get it perfectly right for each aircraft.

*For the moment let's ignore the Systems & Abilities and INOP Aircraft System Signals sections because we haven't checked how well the HS748 systems are seen by FSCaptain. We'll do that later.*

The first resource you should consult is the file `\SimObjects\Airplanes\FSDS3 HS.748\aircraft.cfg`.

In particular interest for FSCaptain, this file contains sections labeled:

- **[General]**
- **[fuel]**
- **[weight\_and\_balance]**

So open this file with Notepad or any other text editor and check these sections.

For the HS748, **[General]** contains this useful information:

Cruise Speed 233 kts @ 10,000, max 260 kts at 20000 ft  
Service Ceiling 25,000 ft  
Empty Weight 26,700 lbs  
Maximum Gross Weight 46,500 lbs

So let's enter:

- Cruise speed = 250 Kts (which is a compromise between the values given)
- Cruise Altitude is wildly off, let's use 23000 ft as that's near-to-service-ceiling.
- Maximum Takeoff Weight = 46000 lbs. That's the Maximum Gross Weight, minus a few hundred pounds to account for taxi-out fuel usage.

There are a lot more numbers, but let's get back to that later.

Now we look at the **[fuel]** section, which says we have two tanks containing 864.72 gallons of fuel each, which sums up to 1729.44 gallons. Now 1 gallon = 6.79 lbs., so the fuel capacity should be 11742 lbs. This is fairly close to what FSCaptain has calculated (11587 lbs), so we just leave it as it is.

Now to the **[weight\_and\_balance]** section which is mostly important because of the "station\_load" lines. However, you might notice that the line "empty\_weight = 25453" doesn't perfectly match the information given in the [general] section. Inconsistencies like this are very common, even with the best developers, so let's simply ignore it. If in doubt, always pick the information given in the form "empty\_weight = .." because this is what the sim will be using.

OK, we've made some progress, but there is still some stuff left to figure out:

*Co-Pilot:* yes, the HS748 has a first officer, like any somewhat larger plane.

*Max Landing Weight:* see below.

*Passenger seats:* this can be determined from the station load sections. Each passenger typically is assumed to weigh 170 lbs. We will see later that station\_load.0, which has 340lbs/170lbs = 2 souls, corresponds to Captain and First Officer. All other PAX rows contain 680lbs/170lbs = 4 passengers. *Remember this when we start working on the Load Map.*

Because we have 10 rows with the same weights on each row, we have a plane with 40 passenger seats. We hope you will understand now why FSCaptain cannot possibly get all these numbers right

automatically for all planes ever developed for our simulators. Some aircraft have one station for all passengers and cargo, while other aircraft have one station *per passenger* – literally hundreds of stations.

*Cabin Crew:* In the U.S., airlines are required by law to have 1 flight attendant for every 50 passenger seats (if there are more than 9 passenger seats in a plane). So the HS748 has a minimum of 1 flight attendant, and this is in agreement with the line “station\_load.11 = ‘170, 0, 0, -1, Steward’.” *Remember this later as well.*

*Jumpseats* are described in the FSCaptain User Guide and will be ignored for passenger flights. For cargo flights, since the HS748 does have a jumpseat (that’s what the Steward uses), we can set that to 1.

*Service Altitude* is the altitude at which flight attendants will jump into action. For a plane like the HS748, 8000 feet is fine. For jets it could typically be 20000 feet or more. Just remember that if you ever make a flight where the Cruise Altitude is close to – or less than – the Service Altitude, your flight attendants may have little to no time to run cabin service. This could trigger a PAXCOM penalty if you do such on a flight with Required Service! Your ACME Dispatch Release should let you know....

So the items left now are Fuel Capacity and Fuel Flow, Max Landing Weight, Minimum Runway Length, and Absolute Payload Maximum.

To get the missing numbers we will ask the Internet; the more specific you ask, the more precise your answer will be. We always like to search for the “takeoff run”. So Googling “HS748 takeoff run” sent us to <http://all-aero.com/index.php/home2/1285-avro-748-hs748> , which contains a lot of what we need:

Maximum landing weight: 43,000 lbs.  
Maximum usable fuel: 11,200 lbs.  
Best rate of climb: 1470 fpm.  
Normal cruise @ 25,000ft: 230 kts.  
Fuel flow @ normal cruise: 1257 pph.  
Takeoff run of only 2,750 feet

So we can enter:

*Maximum landing weight:* 43000  
*Minimum runway:* 2750  
*Cruise speed:* 230 (yes, we’re changing it again as we have obtained more information)  
*Climb fpm:* 1470  
*Fuel Flow CRZ:* 1257

Climb and descent performances are only needed for relatively short periods of time, but it is important to get those numbers right. We would only change the climb speed to 160 kts, simply because 116 seems a little low. (And we’ll confirm that later!)

The one important number that we haven’t found yet is the absolute maximum payload. This will be done later in section 5.

We can look for alternate sources of data, such as the Skybrary page - <http://www.skybrary.aero/index.php/A748> - or even (drum roll....) Wikipedia - [http://en.wikipedia.org/wiki/Hawker\\_Siddeley\\_HS\\_748](http://en.wikipedia.org/wiki/Hawker_Siddeley_HS_748).

Most of the data there supports the numbers we've already discovered.

#### 4. Mapping the exits of your aircraft to their "type"

Many years ago, Microsoft defined a maximum of four exits for aircraft (controlled by the keys SHIFT-E, SHIFT-E #2, SHIFT-E #3, and SHIFT-E #4), and divided them into three signal able types – Main (Passengers), Cargo and Emergency.

By the time of FSX, many airliners used SHIFT-E to control the main crew & passenger exits, SHIFT-E #2 to control the cargo exits, and SHIFT-E #3 for other passenger or perhaps service (catering) exits.

Prior to FSCaptain 1.7.3, the ACME system allowed Captains to define whether or not the FO / FA team would open and close the exits needed to allow passengers and cargo to load. The catch was that FSCaptain would only open and close the *main* exit. Now that's no longer the case....

You can now define which exit numbers belong to a simplified set of exit types: PAX, CARGO, OTHER. On a PAX flight, your crew will operate the PAX exits first, followed by the Cargo exits. On a Cargo only flight, only the Cargo exits will be operated. In case of an emergency landing, your PAX, Cargo and Other exits will all open to allow full evacuation of the aircraft.

If your aircraft uses the standard (SHIFT-E) system, each exit will need to be moved independently. For example, if you're in the default C208B which has exits 2 and 1 defined as OTHER (crew) then when you're executing an emergency evacuation, the PAX door will open first, followed by Cargo door, then the FO's door and finally the Captain's door. (At a speed of 4 seconds per exit, this will take 16 seconds to open all exits.)

Some complex aircraft will need to be interfaced with the FCDU so we can recognize their exit status. Also, some complex aircraft require their own systems be used to open and close their exits. It's their aircraft... we can only do our best to operate with it!

We can enter up to four Exit numbers for each of the three Exit types – just use the Exit's number (1 through 4) or leave an entry blank or at "0" to indicate no other exits for a type. If you want FSCaptain to monitor a particular exit, *but you don't want FSCaptain to operate it* – for example if you use an add-on that wants to control the PAX exits for a special aircraft – just enter those Exit numbers as negative values – in other words use "-1" instead of "1", etc.

If your add-on controls the PAX or Cargo exits at a time where the loading process is ongoing, you may want to consider setting that exit type's mapping to all "0"s, so FSCaptain won't check that exit type's status.

Finally if you are checking an exit type's status, there is an Exit Speed value (in seconds) which is simply the time it should take for an exit to complete moving before the Captain is notified of an "unresponsive exit." By default this is set to 4 seconds – which is just longer than the time most default aircraft need.

#### 5. Creating a passenger load map

Strictly speaking, Load Maps are not necessary to establish a good FSCaptain flight. But if you want to specify detailed loading parameters (where your load stations contain weights that are appropriate to the



developer's purpose – or contain specific passenger ticket types if you are using Economic Mode) or if you want to do things such as disable FSCaptain loading of this particular aircraft, or if you want to map your exits to their “types” you will need a comprehensive Load Map.

By far the best method to create a load map in the Administrator is to go to “Load Maps” and use the Import button. This will essentially copy the content of all station\_load.X entries mentioned above to FSCaptain.

If your aircraft has a utility that allows you to set the load stations outside of the simulator and write those values to the aircraft.cfg file, you should run that utility first and fully load your aircraft's load stations before importing into the Administrator. Doing this allows the Administrator to see the *maximum capacity* of your aircraft's load stations. Only then should you proceed to import the data for your load map.

Select “FSDS3 HS.748” and click OK, which should leave you with something like:

FSCaptain 1.8.1 Administrator - FLIGHTSIM

Achievements | Areas of Concern | Flight Dispatch | Flight Log | Options for All Airlines | Airline Definitions | Aircraft Characteristics | Load Maps | Registration

A load map must be named exactly the same as the folder where its aircraft is defined.

Clear Load Filename: **FSDS3 HS.748**

Import Save Save As... Type: A748 Reg: Name: FSDS3 HS.748

**Payload Stations**

Stn	Active	Pri	Limit	Description	Type	Units	Size	Name	Value
0	<input checked="" type="checkbox"/>	1	0	Pilots		0	0		340
1	<input checked="" type="checkbox"/>	1	0	Row 1		0	0		680
2	<input checked="" type="checkbox"/>	1	0	Row 2		0	0		680
3	<input checked="" type="checkbox"/>	1	0	Row 3		0	0		680
4	<input checked="" type="checkbox"/>	1	0	Row 4		0	0		680
5	<input checked="" type="checkbox"/>	1	0	Row 5		0	0		680
6	<input checked="" type="checkbox"/>	1	0	Row 6		0	0		680
7	<input checked="" type="checkbox"/>	1	0	Row 7		0	0		680
8	<input checked="" type="checkbox"/>	1	0	Row 8		0	0		680
9	<input checked="" type="checkbox"/>	1	0	Row 9		0	0		680
10	<input checked="" type="checkbox"/>	1	0	Row 10		0	0		680
11	<input checked="" type="checkbox"/>	1	0	Steward		0	0		170
12	<input checked="" type="checkbox"/>	1	0	Cargo		0	0		1360
13	<input checked="" type="checkbox"/>	1	0	Front Baggage		0	0		400
14	<input checked="" type="checkbox"/>	1	0	Rear Baggage		0	0		400
15	<input type="checkbox"/>	0	0			0	0		0
16	<input type="checkbox"/>	0	0			0	0		0
17	<input type="checkbox"/>	0	0			0	0		0
18	<input type="checkbox"/>	0	0			0	0		0
19	<input type="checkbox"/>	0	0			0	0		0

Next Previous Compute -->

Static Load (lbs): 0  
Max Payload (lbs): 0

**Fuel Tanks**

Tank	Priority
<input type="checkbox"/> Center	
<input checked="" type="checkbox"/> Right Main	1
<input checked="" type="checkbox"/> Left Main	1
<input type="checkbox"/> Center 2	
<input type="checkbox"/> Center 3	
<input type="checkbox"/> Right Aux	
<input type="checkbox"/> Left Aux	
<input type="checkbox"/> External 1	
<input type="checkbox"/> External 2	
<input type="checkbox"/> Right Tip	
<input type="checkbox"/> Left Tip	

**Optional Overrides**

☐ Passenger ☐ Cargo

Passenger Seats: 0  
Cabin Crew: 0  
Jumpseats (Cargo): 0

☐ Do not play GPWS callouts  
☐ Suppress Auto-Payload  
☐ Simulate Load  
☐ Suppress Auto Fuel Load  
☐ Suppress First Officer  
☐ Suppress Flight Attendant  
☐ No Slick Runways

**Exit Mapping**

Speed: 4 PAX: 1 0 0 0 Cargo: 1 0 0 0 Other: 0 0 0 0 Reset Exit Mapping

OK Cancel Apply



## Technical Tip

All values which can be entered into the Load Map dialog will take precedence over similar values entered into the Aircraft Configuration. These include Max Payload, PAX & Cabin Crew count, and Jumpseats.

The *Filename* and *Type* and *Name* fields at the top of the dialog need not be changed. (*Filename* should not be changed except in rare instances since it must match the name of the folder where the aircraft resides.)

The *Reg* field should be left empty here so our Load Map will apply to all of our HS.748 liveries. (If we want to make a Load Map for a specific livery / airline, we would enter that aircraft's "atc\_id" value here.)

Let's first fix the Optional overrides and set:

*Passenger Seats*: 40

*Cabin Crew*: 1

Since we do not intend for this load map to be for a cargo-only aircraft, we will then check "Passenger" and leave "Cargo" unchecked. This will prevent Dispatch from setting up a Cargo flight for this aircraft. If you check both types (or leave both types unchecked), Dispatch will treat the aircraft as capable of both Passenger and Cargo flights. We'll leave all other options unchecked as we would like to see how it works with auto loading and all audios enabled. Some aircraft don't respond well to "slippery runways" but we don't know that about this aircraft yet.

The Fuel Tanks section only defines the active tanks for the aircraft and allows you to prioritize their fuel loading status. Since we have only a Left and Right main tank, we can keep their Priority set to "1". However if our aircraft were to also have a Center tank, we might want to set the Center tank to a Priority of "2" so it would be used only after the Left and Right tanks were filled.

Since our fuel tanks are OK, we are left with the most laborious part of them all – payload stations. You will see that each station row has *Active* checked, has been given a *Priority* of "1," and has its *Description* and (weight) *Value* imported from the aircraft.cfg file.

Generally you can leave the *Priority* values alone for all but *Type C* stations, but if you want to simulate a quirk such as always having any empty seats in the rear of your aircraft, feel free to set the *Priority* of stations 1 to 10 in that fashion!

The general principles are as follows:

- All crew- and constant-weight stations should be *Type C*, and have their Priority set to 0.
- All passenger-related stations for this aircraft should be *Type Y*. (Types F, J and W are for First Class, Business Class, and Comfort Economy passengers – which were not used on the HS748... although you are free to outfit your aircraft as you like.)
- All cargo station should be *Type G*.
- The Name of each station should be of the "container" that is used. For people, this is usually "Seat" and for cargo it could be "Bag," "Box," "Pallet," or "ULD" – with a maximum length of 8 characters.

- If you leave this field blank, when you press the Compute→ button, a default entry of “Seat” or “Pallet” will be made for you. (But don’t press the Compute → until we’re finished, as doing so will change the *Value* and we need to keep the imported *Value* for now.)
- Every station that contains humans should have a unit *Size* of 170.
- The *Units* of each station are calculated by dividing the *Value* by the number of *Items* in each station. Recall previously that we calculated 2 pilots in the first station, and 4 passengers for each of the passenger stations, and 1 Flight Attendant / Steward. Enter those numbers here.
- For cargo stations we want to have as much cargo as the station can handle, so we must calculate the number of containers and their weights by dividing the imported *Value* to get a reasonable set of numbers.

The two Baggage stations are 400 pounds each – that’s easily divided into 20 bags of 20 pounds. Enter 20 for both *Size* and *Unit* on each of these stations. “Bag” seems a good choice for the Name field.

However the Cargo station doesn’t have such an easily rounded number. First we could simply declare it to be 1 Pallet with a weight of 1360 pounds and be done with it. However one Captain shared an idea a few years ago of using a spreadsheet to easily find whole numbers by dividing the *Value* first by 1 to get that result, then by 2 to get that result, and so forth.

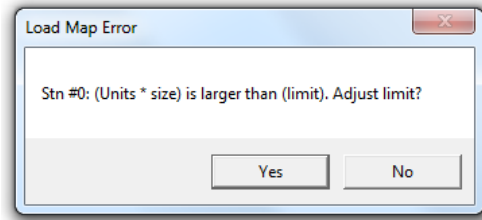
Looking at the calculations to the right, we could choose 1, 2, 4, 5, 8, 10, 16, 17 or 20 *Units* and have a whole number for the *Size*. Two 680lb Pallets sounds like a nice arrangement for our HS748, so we’ll use those numbers.

	A	B	C	D	E	F	G
1		Load Station Weight Calculator					
2		Enter the <i>Value</i> of the load station in the					
3		highlighted cell below and up to 50 different					
4		variations will be calculated.					
5							
6		1360	divided by	1	equals	1360.0	
7		1360	divided by	2	equals	680.0	
8		1360	divided by	3	equals	453.3	
9		1360	divided by	4	equals	340.0	
10		1360	divided by	5	equals	272.0	
11		1360	divided by	6	equals	226.7	
12		1360	divided by	7	equals	194.3	
13		1360	divided by	8	equals	170.0	
14		1360	divided by	9	equals	151.1	
15		1360	divided by	10	equals	136.0	
16		1360	divided by	11	equals	123.6	
17		1360	divided by	12	equals	113.3	
18		1360	divided by	13	equals	104.6	
19		1360	divided by	14	equals	97.1	
20		1360	divided by	15	equals	90.7	
21		1360	divided by	16	equals	85.0	
22		1360	divided by	17	equals	80.0	
23		1360	divided by	18	equals	75.6	
24		1360	divided by	19	equals	71.6	
25		1360	divided by	20	equals	68.0	
26		1360	divided by	21	equals	64.8	
27		1360	divided by	22	equals	61.8	
28		1360	divided by	23	equals	59.1	
29		1360	divided by	24	equals	56.7	
30		1360	divided by	25	equals	54.4	

There is a copy of this OpenDocument Spreadsheet in your \FSCaptain\Documents\ folder, or you can download one from here: [http://www.fscaptain.net/downloads/Load\\_Station\\_Calculator.ods](http://www.fscaptain.net/downloads/Load_Station_Calculator.ods). It will load in Excel and other spreadsheet programs and allow you to customize the loading parameters of any cargo.

By the way, notice we’re using two 680lb carriers in this cargo area – that equals two passenger rows, which tells us the size of the cargo area is roughly the size of two rows of seats!

- The *Limit* of each row should be set by multiplying the Size and Unit values. You can do so yourself, but now that we have added all the station data that's necessary we can press the Compute→ button, and each station will ask if you want the Limit adjusted (calculated). Answer "Yes" for each station.



Some aircraft developers allocate load stations for crew, and some developers don't. For those aircraft that are modelled as such, we need to prevent Dispatch from using those stations for PAX and cargo. This is why we set the Priority for those stations to "0". They represent what is called "Static Weight."

You would have noticed in that last screen, the *Value* fields had changed – they now represent the "Static Weight" per Station. This is the weight that must be deducted from the Max Payload to give Dispatch the "Maximum Useable Payload" that can be allowed on this aircraft.

### Aviation Tip

For very large aircraft, this value loses some significance – the total weight of the crew against that of hundreds of passengers is quite small. However on an aircraft of the size of our Hawker Siddeley HS748, we can see that *slightly over 5%* of the maximum load is taken up by static elements.

Smaller aircraft, such as Cessna 208 Caravans or de Havilland Twin Otters would have greatly increased ratios of Static Load to Max Payload – 7% to 11%. Tiny aircraft, such as a Cessna 172 Skyhawk would have *over 15%* of their possible load taken up by a single Captain!!

You can edit the Max Payload to a certain extent if your airline has rules on how much weight you can carry. (Remember the trick earlier where you set all of your load stations to a full load might be more weight than the aircraft itself can carry!) On a cargo aircraft, you can set the Max Payload down to the Static Load value (and carry *no paying load!*), but on a passenger aircraft, you are limited to a full passenger manifest, plus the maximum weight of baggage.

If you need to do this, edit the value in the Max Payload textbox and press Compute again to have the Administrator validate your entry.

(We won't do this in our example here.)

Now we can look at the exits of our aircraft.

Going to Spot View to get a view of the outside, we press SHIFT-E and see the rear left-hand exit open. It's roughly the shape of a standard aircraft passenger exit, so we'll note that Exit 1 is a "PAX" exit. SHIFT-E #2 opens a large cargo exit on the front left, so we'll note that Exit 2 is a "Cargo" exit. SHIFT-E #3 and SHIFT-E #4 don't control anything, so we'll enter "1" for a PAX exit, and "2" for a Cargo exit. There are no "Other" exits, so we'll leave their mappings as "0".

If we are using a Ground Service utility which could control the PAX exit, we could monitor the exit's status without allowing our crew to manipulate it by entering the exit number *as a negative*. In this case, we would enter “-1”. But for the purposes of our tutorial, we’ll leave the value as “1”.

We’ll leave the Exit Speed set to 4 seconds – that’s long enough for most default aircraft exits to complete movement. A few tests later on and we can see if we need to change this.

At this point, we should have something like this, almost ready to be saved:

A load map must be named exactly the same as the folder where its aircraft is defined.

Clear Load Filename: FFSDS3 HS.748

Import Save Save As... Type: A748 Reg: Name: FSDS3 HS.748

Stn	Active	Pri	Limit	Description	Type	Units	Size	Name	Value
0	<input checked="" type="checkbox"/>	0	340	Pilots	C	2	170	Seat	340
1	<input checked="" type="checkbox"/>	1	680	Row 1	Y	4	170	Seat	0
2	<input checked="" type="checkbox"/>	1	680	Row 2	Y	4	170	Seat	0
3	<input checked="" type="checkbox"/>	1	680	Row 3	Y	4	170	Seat	0
4	<input checked="" type="checkbox"/>	1	680	Row 4	Y	4	170	Seat	0
5	<input checked="" type="checkbox"/>	1	680	Row 5	Y	4	170	Seat	0
6	<input checked="" type="checkbox"/>	1	680	Row 6	Y	4	170	Seat	0
7	<input checked="" type="checkbox"/>	1	680	Row 7	Y	4	170	Seat	0
8	<input checked="" type="checkbox"/>	1	680	Row 8	Y	4	170	Seat	0
9	<input checked="" type="checkbox"/>	1	680	Row 9	Y	4	170	Seat	0
10	<input checked="" type="checkbox"/>	1	680	Row 10	Y	4	170	Seat	0
11	<input checked="" type="checkbox"/>	0	170	Steward	C	1	170	Seat	170
12	<input checked="" type="checkbox"/>	1	1360	Cargo	G	2	680	Pallet	0
13	<input checked="" type="checkbox"/>	1	400	Front Baggage	G	20	20	Bags	0
14	<input checked="" type="checkbox"/>	1	400	Rear Baggage	G	20	20	Bags	0
15	<input type="checkbox"/>	0	0			0	0		0
16	<input type="checkbox"/>	0	0			0	0		0
17	<input type="checkbox"/>	0	0			0	0		0
18	<input type="checkbox"/>	0	0			0	0		0
19	<input type="checkbox"/>	0	0			0	0		0

Next Previous Compute --> Static Load (lbs): 510 Max Payload (lbs): 9470

Exit Mapping Speed: 4 PAX: 1 0 0 0 Cargo: 2 0 0 0 Other: 0 0 0 0 Reset Exit Mapping

OK Cancel Apply

Again, notice the “Reg:” field at the top of the dialog. If you want to save this load map to be used only by a single aircraft you would enter the aircraft’s registration number – noted in the aircraft.cfg as the “atc\_id” of the livery type. If you had chosen the “First Air” livery in your simulator, you would find its atc\_id value is C-GGNZ. Enter C-GGNZ in the Reg: field and then save.

But that's a rare condition. Typically, Captains want to make load maps to serve all aircraft... or at least all PAX and Cargo variants.

If you want to have Passenger and Cargo load maps, you would want to use Save As and save each load map into the \PAX\ or \Cargo\ folders inside the \FSCaptain\Aircraft\Maps\ folder.

So let's leave the Reg: field empty and save this load map by clicking "Save As" and navigate to the \PAX\ folder. Leave the filename as it is – it must match the folder name, with ".cfg" as the file extension.

This HS.748 does come with "cargo" models as well, but since both cargo and passenger variants share the same aircraft.cfg file – they'll both use the same number of stations – this means we can take our current map and make minor changes to give us a load map for our cargo flights!

## 6. Creating a cargo load map

This will be a piece of cake since we have the Passenger Load Map already loaded and we will be merely changing a few parameters since the station loadouts will be the same. So to avoid accidentally overwriting our PAX load map, do a Save As and save this into the \Cargo\ subfolder.

Remember, load map file names must match the aircraft's "folder name" in this case "FSDS3 HS.748".

Now in the Optional Overrides group, uncheck Passenger and check Cargo. Set *Passenger Seats* to 0, *Cabin Crew* to 0, and *Jumpseats* to 1. (That's because the HS748 has a jumpseat.)

The fuel tanks do not need changing, so let's go to the Payload Stations and start changing things there. This time we can work from the last station to the first!

The two Baggage areas can keep the same *Unit*, *Size* and *Name* values. We can change the *Description* from Front/Rear Baggage to Front/Rear Storage. (Or Front/Rear Lower Cargo, etc.) The lower storage areas likely won't be carrying a "Bag" but we'll wager they can carry a "Box" just as well.

The main-deck Cargo station can remain the same.

Now we come to the Steward station – the Galley area. Change the *Description* to "Cargo". Since the *Size* is small for a Pallet, change the *Name* to "Box", the *Type* to G and the *Priority* to 2. It will likely be the last used storage area on the aircraft.

The other Passenger Rows can have their *Description* changed to "Cargo", their *Name* to "Pallet", their *Type* to G, and the *Unit* to 2 and the *Size* to 340. This is a wild assumption on our part – perhaps a real HS748 can carry more cargo weight in the same areas as passenger weight. If anyone out there could correct us, we'd be happy to credit you on an update!

As for the Exit Maps, since we'll keep a spot open for ride-alongs, we'll keep a PAX exit map ready for when we have a passenger – and even if we didn't have a jumpseat, our crew might find that exit handy. So leave everything there as-is.

This gives us a load map which looks like this:

FSCaptain 1.8.1 Administrator - FLIGHTSIM

Achievements | Areas of Concern | Flight Dispatch | Flight Log | Options for All Airlines | Airline Definitions | Aircraft Characteristics | Load Maps | Registration

A load map must be named exactly the same as the folder where its aircraft is defined.

Clear Load Filename: FSDS3 HS.748

Import Save Save As... Type: A748 Reg: Name: FSDS3 HS.748

Payload Stations

Stn	Active	Pri	Limit	Description	Type	Units	Size	Name	Value
0	<input checked="" type="checkbox"/>	0	340	Pilots	C	2	170	Seat	340
1	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
2	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
3	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
4	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
5	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
6	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
7	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
8	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
9	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
10	<input checked="" type="checkbox"/>	1	680	Cargo	G	2	340	Pallet	0
11	<input checked="" type="checkbox"/>	2	170	Cargo	G	1	170	Box	0
12	<input checked="" type="checkbox"/>	1	1360	Cargo	G	2	680	Pallet	0
13	<input checked="" type="checkbox"/>	1	400	Front Storage	G	20	20	Box	0
14	<input checked="" type="checkbox"/>	1	400	Rear Storage	G	20	20	Box	0
15	<input type="checkbox"/>	0	0			0	0		0
16	<input type="checkbox"/>	0	0			0	0		0
17	<input type="checkbox"/>	0	0			0	0		0
18	<input type="checkbox"/>	0	0			0	0		0
19	<input type="checkbox"/>	0	0			0	0		0

Next Previous Compute -->

Static Load (lbs): 340  
Max Payload (lbs): 9470

Fuel Tanks

Tank	Priority
<input type="checkbox"/> Center	
<input checked="" type="checkbox"/> Right Main	1
<input checked="" type="checkbox"/> Left Main	1
<input type="checkbox"/> Center 2	
<input type="checkbox"/> Center 3	
<input type="checkbox"/> Right Aux	
<input type="checkbox"/> Left Aux	
<input type="checkbox"/> External 1	
<input type="checkbox"/> External 2	
<input type="checkbox"/> Right Tip	
<input type="checkbox"/> Left Tip	

Optional Overrides

☐ Passenger ☒ Cargo

Passenger Seats: 0  
Cabin Crew: 0  
Jumpseats (Cargo): 1

☐ Do not play GPWS callouts  
☐ Suppress Auto-Payload  
☐ Simulate Load  
☐ Suppress Auto Fuel Load  
☐ Suppress First Officer  
☐ Suppress Flight Attendant  
☐ No Slick Runways

Exit Mapping

Speed: 4 PAX: 1 0 0 0 Cargo: 2 0 0 0 Other: 0 0 0 0

Reset Exit Mapping

OK Cancel Apply

All we need to do here is to click Save, since we've already saved as into the \Cargo\ folder.

## 7. Returning to the configuration file - A748.cfg

We earlier mentioned that we didn't set the Absolute Maximum Payload yet in file A748.cfg, but now we have the Max Payload value from the load maps, we can transport the value to the configuration file:

Published maximum payloads on the Internet are in the range from 10000 to 12000 lbs, so we are not too far off. In reality, max payload depends on many factors, such as the power of the engines, the equipment of the plane (installing seats will reduce the payload of course) and so on, so expect some variation in these numbers. If you want to, you can set the Absolute Maximum Payload to a higher number since FSX allows you to put as many pounds in each station as you wish. Doing this would simply mean that FSCaptain will generally offer you flights with larger amounts of payload; there would be no difference in how FSX works (except that your plane may be overweight).

### Technical Tip

We actually do not need to set an accurate Max Payload in the configuration file if we are using a Load Map – all values that are specified in the Load Map will take precedence over values in the configuration file. So if we were to enter 8000 lbs or 12000 lbs in the configuration file and keep our Load Map as-is, Dispatch would use the Load Map calculated (or edited!) Payload values.

Remember this if you're ever given a payload that doesn't match what is stated in the aircraft configuration file – your Load Map data may be different!

So while it may not make sense to copy this value to the configuration file, should you ever decide to not use the load maps, the correct value will already be in the configuration file.

## 8. Interfacing with the FCDU

If you switch on FSCaptain's FCDU during the test flight, you may notice something rather unpleasant: some of the interfaced systems for this plane may not be working.

In fact, this is the reason why we picked this plane for the original tutorial. Chances are that your favorite new plane may be dealing with all buttons a little different than default FSX planes, and if nobody in the FSCaptain team owns your plane then we don't have a chance to implement this special code in FSCaptain. This tutorial hopefully helps you & us to create an "aircraft interface."

This section will have a lot of overlap with the document "*Introduction to FSCaptain Interfaces.pdf*", which is included in the folder `\FSCaptain\Documentation\` and basically provides the same information with the example of the Majestic Bombardier Dash 8 Q400. We will therefore be brief and refer to that document for more details.

*Again, this aircraft is currently fully interfaced with FSCaptain, so what you are about to read is the state in which we found this aircraft.*

### **Step A:** Find out which buttons work and which need to be fixed.

To do so,

- Start your simulator with the HS748's engines running and with the FCDU activated.
- In the FCDU, go to OFFLINE -> INFORMATION -> SYSTEM
- We see that MAIN BATTERY is already on – that's good.
- In the overhead panel, switch on BELT SIGN and NO SMOKING SIGN. Adjust your altimeter's pressure setting on the panel. The IGNITION is marked as INOP (we're not using the ENABLE\_DEFAULT\_IGNITION option on this flight).
- WINDSCREEN HEATING is marked as INOP, so we'll skip that for now.



At this point you should see something like this:

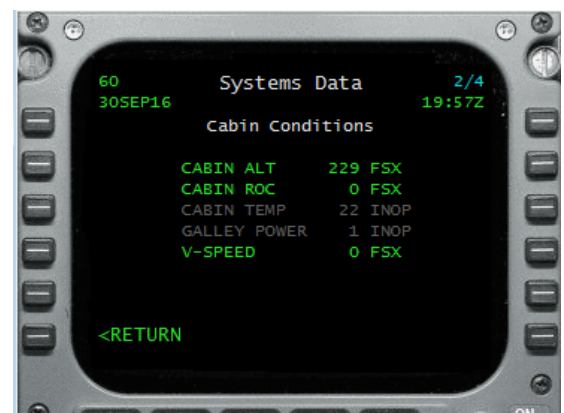


The ALTIMETER setting seems to track (it can vary by a millibars or two and be okay). You will notice that the FCDU indicates BELTS & SMOKING are off. That's something we will look to address when we're finished here. IGNITION and WINDSHIELD HEAT are noted as INOP with an indication of being on. That means we would credit you with having activated these systems when needed. Still, if we can find some switches later on that would operate these systems, that would be much more authentic!

On the FCDU, click on NEXT to access the second interface page, visible to our right:

This page lists CABIN ALT, ROC and TEMP and the vertical speed. There's no way to test them here while on the tarmac.

There's also GALLEY POWER, but that's currently INOP as well.





Click on NEXT again to access the third interface page.

In the overhead panel, switch on:

- BEACON LIGHTS
- LANDING LIGHTS
- NAV LIGHTS

And lower your flaps one notch – notice the value of “13” for the flaps.

And if you haven’t done so already, check that your PARKING BRAKE is set. 😊

You should now see something like this to the left on your FCDU.

That’s very good! All systems here except the INOP’ed BRAKE TEMP seem to recognize the simulator signals.

Now it’s on to the final page of the SYSTEMS screen – Anti-ice, Engines and Exits.

You’ll recall earlier that we asked you to have your engines running. So it’s no surprise to see that we can see #1 and #2 engines are blazing away below. (If an engine were not running it would be represented by a dot / period.) One to four engines can be monitored, as our simulators do not allow for more than four engines in our aircraft... and FSCaptain isn’t authorized for gliders!



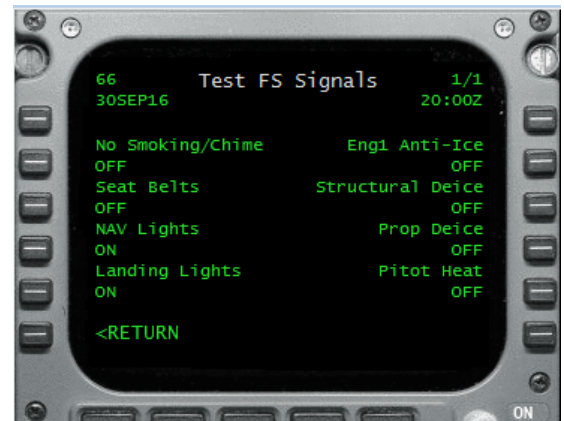
Now let's switch on the engine and structural anti-ice systems from the overhead panel:



Well they don't seem to work... but we can double check these HS748 systems if we go to the Test FS Signals screen by pressing the LSK to the right of SIGNALS>....

This screen shows only the FS9 / FSX / P3D signals – not the ones from an aircraft's interface. This screen is intended only for testing if the simulator's signals are available. We can see that both of the aircraft's anti-ice systems are OFF, so we will mark these down as LVARs to search for.

You'll also note here that the NAV and Landing Light signals are present in the simulator. That's how we could see them available on an earlier SYSTEMS screen.



But we can also use this screen to actually *toggle the simulator signals* so we can see what an active anti-ice system would look like.

Click on the LSK to the right of both the Eng1 and Structural anti-ice systems; verify they toggle to ON, and RETURN to the SYSTEM DATA screen.

Here is what it would look like if the Engine #1 anti-ice and the Structural anti-ice systems were both on:



The “1” represents that Engine 1’s anti-ice system is running and the “+” indicator represents the Structural anti-ice is running. Notice that the anti-ice system is designated as getting its data from FSX... and as we’ve seen our HS748 doesn’t operate those signals.

Now we can go back to the SIGNALS screen and deactivate both anti-ice signals there, return to this SYSTEMS screen and shut down both of our aircraft’s engines. It’s time to test the exit mapping, and many safety regulations require that engines be shut down when engines are running.

Now considering what we’ve learned about our aircraft’s systems and signals, we see that we have two main options available to us:

- (i) Use the aircraft as it is. In this case, you should set the FSCaptain options such that you do not receive penalties for not operating the seat belt signs. You also should disable the ice hazard package in FSCaptain because you will not be able to do anything about ice in the air. Had the Altimeter Setting or any of the Lights not worked, you could declare them as INOP on an aircraft override from your Aircraft Configuration tab.

This is not the ideal solution, but using it you can still enjoy the many other features that FSCaptain has to offer.

- (ii) Help us create an interface. This is described in Step B.

### **Step B: Finding the missing LVARs and their values.**

To create an interface for the missing systems, the FSCaptain team needs to know which variables in FSX change when a button is pressed in the plane. There is no way we can do that if we do not own the plane, so this task is occasionally up to people like you. In “*Introduction to FSCaptain Interfaces.pdf*”, we describe how to set up and use the LINDA utility for this purpose, so we assume here that you have installed LINDA and are ready to search for what happens when one of the non-functioning switches is operated.



For the HS748, we found the following:

FCDU BELT SIGN	LVAR <code>Fasten_Belts</code> = 0 (on) or 1 (off)
FCDU NO SMOKING SIGN	LVAR <code>No_Smoking</code> = 0 (on) or 1 (off)
FCDU WINDSCREEN HEATING	LVAR <code>Port_WS_Heat</code> = 0 (off), 1 (low), or 2 (high) LVAR <code>Stbd_WS_Heat</code> = 0 (off), 1 (low), or 2 (high)
FCDU IGNITION	LVAR <code>No1_Relight</code> = 0 (off), 1 (low), or 2 (high) LVAR <code>No2_Relight</code> = 0 (off), 1 (low), or 2 (high)
FCDU ENGINE DE-ICE	LVAR <code>No1_PUD</code> = 0 (off), 1 (slow), or 2 (fast) LVAR <code>No2_PUD</code> = 0 (off), 1 (slow), or 2 (fast)
FCDU STRUCTURAL DE-ICE	LVAR <code>Pneumatic_Deicer</code> = 0 (on) or 1 (off)

All of these except the IGNITION system are controlled from clearly marked overhead panel switches. The IGNITION system is controlled by the port and starboard re-lighter switches located on the center pedestal.

Although there are simulator-fed signals for Cabin Altitude and Cabin Rate of Climb that are noted on the SYSTEMS screen, page 2 (Page 16 of this document) there are some easy to use signals from the aircraft which take into account the simulated systems. So we use these:

CABIN ALT	LVAR <code>Cabin_Altimeter</code> = 0 (on) or 1 (off)
CABIN ROC	LVAR <code>Cabin_ROC</code> = 0 (on) or 1 (off)

We even noticed a few LVARs which the aircraft uses to transmit its calculated V2, Vr, and Vapp speeds!

VSPEEDS	LVARs <code>V2</code> & <code>V2_FLAP15</code> (V2 for takeoff flaps 7 & 15) LVAR <code>VR</code> LVAR <code>Vat22</code> & <code>Vat27</code> (Approach for Flap 22 & 27)
---------	--

And while the HS.748 does sport a galley for long passenger flights, we could not find an LVAR that would indicate if a bus was energized or if a coffeepot was brewing. BRAKE TEMP, CABIN TEMP, and GALLEY POWER are the three scarcest systems for us to track.

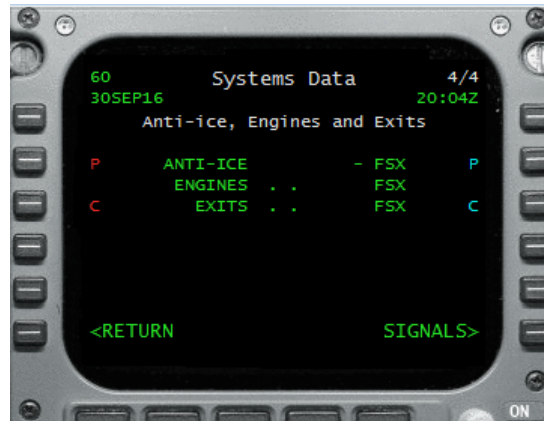
### **Step C: Creating an interface.**

This is all the FSCaptain team needs to make an interface, *even if we don't have that plane*. To actually get the interface created, just send us the data from Step B and work with us as we create test interfaces until we hit the sweet spot. There are nearly a half-dozen aircraft that work well with FSCaptain although we don't have access to them. Your new favorite aircraft could be next!

## 9. Testing the Exit Mapping

Okay, several minutes have passed since we shut down our HS748's engine (this aircraft has modeled a complex-for-its-time shutdown procedure) and those big props do take some time to spin down.

Now our SYSTEMS screen has taken a new look – one designed to support testing of Exit Mapping:



First we'll note that both #1 and #2 engines have indeed stopped. But to the sides we see the Open (on the left, in red) and Close (on the right in cyan) Exit Commands. These can be used to test opening and closing of our aircrafts PAX, Cargo and Other Exits.

If you recall there are no Other exits defined on our HS748, so there's no need for Open and Close indicators there.

Pressing the LSK for the Red "C" will open the Cargo exit, and the LSK for the Red "P" will open the rear Passenger exit. Pressing the LSKs for the Cyan C and P will close them. During an actual flight, if you authorize your crew to operate the exits, they should open and close PAX and Cargo exits at the appropriate times – even opening all exits in case of an emergency evacuation!

If you are using the default simulator event to open and close exits and if have more than one exit mapped to a type – for instance Exit 1 and Exit 2 on the FSX default Cessna 208B should be mapped as Other – first one exit will move and complete, then the other.

In our studies of many aircraft which work with the default simulator exit events, 4 seconds is a good time for the exit to have "changed position," and that appears true for our HS748. But if you find that you are seeing notices that "Exit 1 is not responsive" you may want to slowly increase the Exit Speed setting for that aircraft. If you increase the Exit Speed setting too high, other exits will wait that amount of time before they are processed.

Such is not a real consequence on our HS748. It has one PAX and one Cargo exit.

## 10. Improving fuel flow numbers – time for a flight!

Now we are essentially done with the configuration of the plane, but chances are that you might still run out of fuel if you use the fuel flow numbers given above. The reason is that Flight Simulator airplane developers don't get the fuel consumption right all the time. Even though we entered the correct fuel flow for the real plane, the flow in the simulator could be different. An example is the default FSX Boeing 737-800, whose fuel flow is twice that of the real plane. (!!)

This is of course if you have not modified your aircraft model and aircraft.cfg file. It's possible to have that bird achieve much better numbers. And that's why you need to make test flights with the FCDU enabled.

So there is no other way than to *take your plane out for some test flights and note the fuel flow during climb, cruise, and descent*. Doing this instead of consulting web pages (or even official aircraft and airline documents) has the advantage that you get the fuel flow right *for your personal style of flight*. Some people like to fly low, some as high as possible; some go for maximum speed while others try to follow real world practice, and so on. All this affects fuel consumption, so getting it right for your personal procedures will optimize your FSCaptain fuel calculations.

If this appeals to you, then we suggest that you create an airline solely for testing purposes. Name it "Test Air" if it suits you. Don't worry about your score, just focus on flying your aircraft the way that suits you.

Now, take your new aircraft and set up some flights. Make these long flights to stretch the fuel duration of the aircraft, and since they're test flights don't use an external weather engine. Instead use ISO weather with "calm winds" and "clear skies" and "standard pressure." Use a very involved flight plan with lots of waypoints – because when you hit a waypoint in FSCaptain, we record gobs of data to your FCDU log file like these:

```
FCDU.GAU:: 21:24:59 ##! Aircraft Data: TAS: 170. GS:166. VS:969. Pitch: -  
3.446840. Bank: -1.536279. A/C Weight: 36866.000000. Fuel remaining: 1943.  
Fuel flow (current): 1069. Hdg: 304. Altimeter: 29.979710.
```

This was taken soon after takeoff and gives us one data point to adjust the fuel flow rate during climb. (And it also confirms the climb groundspeed is well above 116kts!)

Doing this instead of consulting web pages etc. has the advantage that you get the fuel flow right for your aircraft and your personal style of flight. Some people like to fly low, some as high as possible; some go for maximum speed while others try to follow real world practice, and so on. All this affects fuel consumption, so getting it right for your personal procedures will optimize our fuel calculations for you.

So now we have PAX and Cargo load maps, along with an aircraft configuration file that has good fuel flow recognition. Our interface happens to have been sorted out, and no critical aircraft control systems have to be flagged as INOP.

Our job is done for now....



## 11. Final Thoughts and Wrapping Up

The FSDS **Hawker Siddeley HS748** is an aircraft with its own charm! It models an aircraft designed in the 1950s as a rugged short-field British replacement for the American DC-3, which is still in use today mostly in passenger, fuel hauling, and in quick-change combi layouts.

The implementation by these developers is commendable – if you have not had to work with an aircraft that required a complex startup and shutdown procedures, this aircraft comes along with “active checklists.” These are panels which pop up and tell you what to do in each phase of flight operations, from Before Start through Shut Down – all while indicating the status of each of the systems that need attention. And there are even “active emergency checklists” to cover Manual Propeller Feathering, Flameout, and Fuel Starvation.

For all Captains looking for a challenge, we recommend that you give this aircraft your consideration.

To recap our suggestions, since FSCaptain ships with update aircraft configuration, PAX and Cargo load maps, and an interface for all but three non-critical systems – after installation and review of the HS748 Cockpit Manual, set up a test airline and make some short and long test flights in ISO conditions to get a feel for your proper fuel consumption. Then once you can make a test flight and “hit your fuel numbers” you can add this beauty to one of your active airlines!

As for future plans for this document, we hope to show you how to implement override configurations for specific aircraft, and how to tweak your load maps and aircraft.cfg file to obtain more accurate weight placement. (If you would like to tinker with that in your own time, we will suggest altering the PRIORITY levels of your main Passenger and Cargo stations....)

Happy Flying with ACME!  
Peter & Travis, for your FSCaptain Team