

Flight Plan Creation Using Universal FMS

The Universal UNS-1 is a very common flight management system (FMS) which is can be found in the Bombardier Q400, Learjet 45 as well as the Boeing 737-500 (retrofit) in Aerofly FS 2 with only minor differences between them. The simulated devices can be used to change the flight plan from within the cockpit, without having to leave the aircraft and going back to the main menu.



Keyboard and Line-Select-Keys

Fields on the displayed page are selected with the line-select-keys (LSK) to the left and right of the display. After pressing a line select key next to a field that can be edited the field will be displayed in reverse video (white background). The value can now be edited with the alphanumeric keyboard. When the entry is complete the enter key is pressed to insert the new value. Changing the page or selecting a different field on the page discards an entry.

The Universal UNS-1 has no scratchpad like the [Airbus MCDU](#), [C90GTx CDU](#) or the [Boeing CDUs](#).

Pages

The information from the flight management system (FMS) as well as other systems such as the attitude heading reference system (AHRS), global positioning system (GPS) and others are presented on numerous pages in the control display unit (CDU). The control display unit (CDU) is the cockpit interface that the pilot use to input data into the flight management system (FMS).

The Universal UNS-1 pages are

- **DATA** - used to access raw data of the GPS, AHRS, nav-data, etc.
- **NAV** - navigation page with the current flight plan leg, from and two waypoint and next waypoint after that.
- **VNAV** - vertical navigation page to plan the descent profile.

- **DTO** - direct to page for navigating directly to a specific waypoint, skipping any route waypoints in between.
- **FUEL** - pages for fuel planning and fuel consumption monitoring.
- **FPL** - flight plan page to edit the flight plan, selecting departures and arrivals, adding or removing waypoints
- **PERF** - performance pages for weight and balance calculations
- **TUNE** - radio navigation tuning, auto-tuning option, lists of nearest VORs, NDBs, etc.

The keys labeled LIST, MENU, PREV and NEXT perform functions on the select page. For example the MENU button opens the menu for the selected page, PREV (previous) and NEXT (next) buttons scrolls through the sub-pages.

Flight-Plan Page

- Press the **FPL** page to access the flight plan pages. Repeated pressing of the FPL as well as pressing the PREV and NEXT keys cycles through the available flight plan leg pages and the flight plan summary.

Creating a Flight-Plan

Deleting The Route

To delete any previous route, e.g. the route created with the Aerofly FS 2 navigation menu:

- Press the MENU button
- Select the DELETE FPL
- Press the highlighted DELETE FPL again to confirm the deletion of the flight plan.

The route is now completely removed.

Enter New Origin

Now the flight plan page should be empty and only the first line should be selected.

- Click the first line if it is not already selected
- Use the CDU keyboard to enter the departure airport ICAO identifier, e.g. KBUR
- Press the ENTER key when you are finished typing

The cursor now moves to the next field.

Adding Waypoints

With the cursor at the end of the flight plan you can type in the identifier of a waypoint. For example:

- Type SM0 with the CDU keyboard to add the Santa Monica VOR
- Press ENTER to confirm.

For the Learjet 45 tutorial repeat this process for the VORs CMA and GVO.

You can also see a list of nearby waypoints by selecting a position in the flight plan, where the

waypoint should go, then pressing the LIST key. When you find the desired waypoint just enter the list position (not the name) and confirm with enter. The waypoint will be automatically added to the flight plan.

Add Destination

At the end of the flight plan we can add the destination airport ICAO identifier.

- Type KSBA for Santa Barbara.
- Press ENTER to select it as the destination airport.

Add or Change Departure

With the flight plan page open simply hit the MENU button. From the displayed menu select the DEPART option on the left with the line select key next to it.

- On the departure page select the RUNWAY field with the line select key next to it, if not already selected.
- Scroll through the list of runways with the PREV/NEXT buttons until you see the desired departure runway
- Type in the list index (not the runway identifier), e.g. for runway 08, which is first in the list, type 1.
- Complete the entry with the ENTER key.
- (selecting a SID is not yet implemented)
- Click the FPL link to get back to the flight plan page.

Add or Change the Arrival

With the flight plan page displayed open the flight plan menu by pressing the MENU key. Select the ARRIVE option.

- On the ARRIVE page select the RUNWAY field, if not already selected
- Scroll through the list of runways with the PREV/NEXT buttons
- Type in the list index (not the runway identifier) to select a runway from the list. E.g. type 1 to select runway 07.
- ENTER
- (selecting a STAR or APPR is not yet implemented)
- Click the FPL link to get back to the flight plan page.

Verification and Flight Plan Summary

After all waypoints have been added, step through the legs on the flight plan page with the PREV and NEXT buttons. Check that there are no gaps in the flight plan and that the route is indeed the flight plan that was filed.

At the end of the flight plan pressing the NEXT button will show the flight plan summary. Here you could enter an expected cruise speed (TAS), expected average fuel flow (FF), fuel reserves and the expected time of departure (ETD). (Some of this may not be simulated at this time).

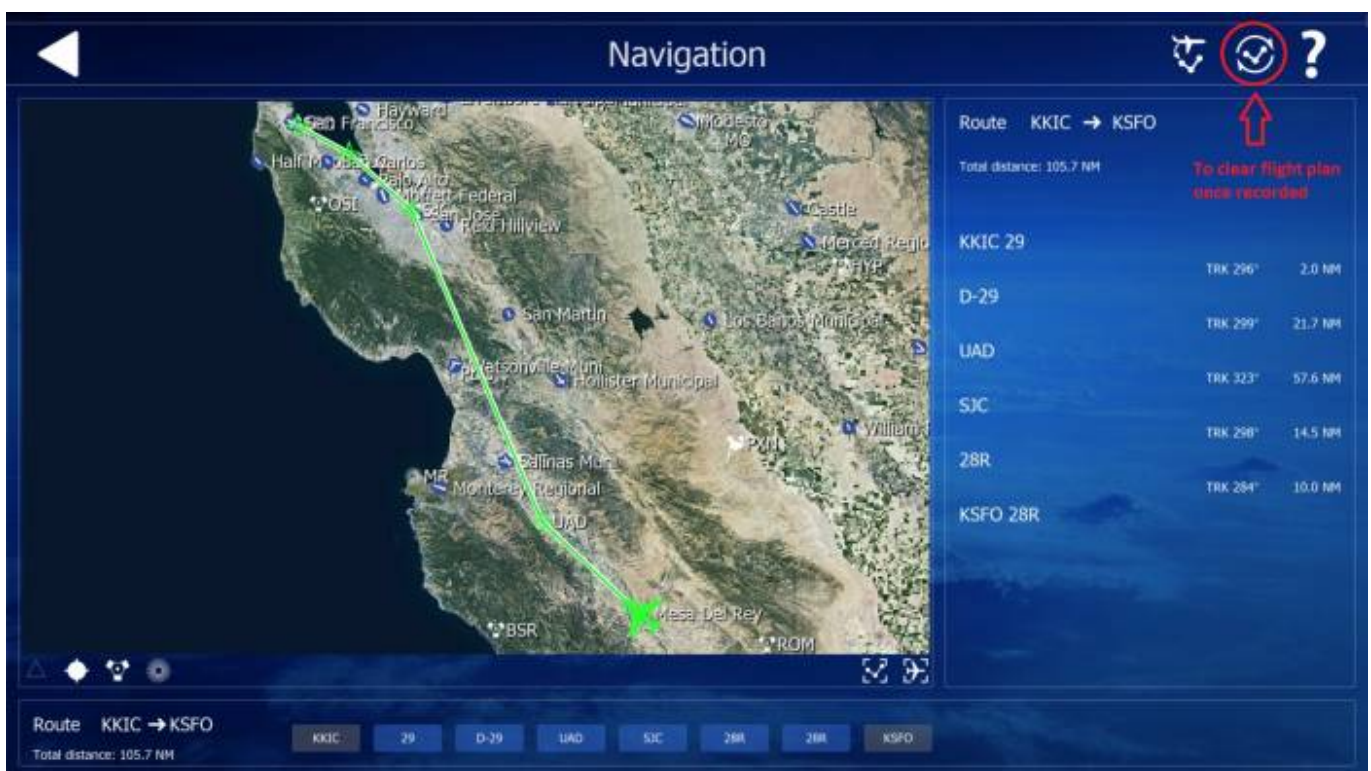
Note - Editing the flight plan like this is optional and always will be. You can always go back to the navigation menu and change the flight plan from there.

backup

The latest alpha/beta builds introduced some new FMS screens in the **Q400, LJ45, and the retrofit FMS in the B737**; one of them being the flight plane page (FPL). Instead of using the Navigation page to enter the plan into the FMS it's more realistic to enter it manually into the FMS. Because not everyone might know how the FMS works here is a general tutorial showing how it's done.

If you don't already know the route and ICAO to plan the flight a good way to get the information that you need is to use the Navigation page for your prep work. **Note:** After planning the flight using the navigation page you can clear the plan by clicking on the circular icon in the top right corner; this way the (FLP) page of the FMS will be empty once you enter the cockpit.

- In this tutorial we will be using the Q400 so go ahead and select that aircraft now.



- We'll fly from **KKIC (Mesa Del Rey) to KSFO (San Francisco)** for this tutorial so go ahead and set this flight plan up on your navigation page.
- Now write down the entire flight plan on paper. **Note:** You can also select airports from a list on the FMS but for this tutorial we will write it down to simulate real-life planning.

You should written the below information down:

- KKIC runway 29
- UAD (this is an NDB)
- SJC (this is a VOR)
- KSFO runway 28R
- Now remove the plan from the Navigation page and step into the Q400 cockpit. The FMS should look like this:



We are at the FPL page already and the first field is ready for input. There are two ways to enter data into each field: you can type it in or select it from a list. We'll start with typing.

1. Type KKIC and press ENTER



2. Type UAD and press ENTER



For the next waypoint we will use the **list** option. **Note:** using the list you can enter VORs, NDBs, airports and more: make sure you know what kind of waypoint you are looking for, because you won't find a VOR in the NDB list, which is why we write down all details from the navigation screen.

3. Press **LIST** and then press the **LSK** next to VOR (Line Select Key- these are the buttons left and right of the FMS screen). You will see a list with VOR's beginning with the one closest by.



4. Press **NEXT** until you see **SJC** in the list (it should be number 12 on the second screen)



5. **Type 12** and press **ENTER** SJC will be added to the flightplan



6. **Type KSFO** and press **ENTER**: we also could have used the **LIST** option for this (KSFO would have been number 41 on the 6th page!)



Now we will select the departure and arrival runways

7. Press MENU



8. Press the LSK next to DEPART (you will see a list of all available runways)



9. We want runway 29 which is number 2 so **type 2 and press ENTER**



10. Press the LSK next to FPL which will bring you back to the FPL page: the correct runway will be entered in the plan: you can check the heading and AFS2 will have added an automated waypoint in between the departure airport and UAD



11. Press **MENU** and then the **LSK next to ARRIVE**



12. Runway 10L has been entered automatically but we want runway 28R so **press the LSK next to 10L**; you will see a list of all available runways (if there are more runways they may not fit on one screen: in that case use NEXT and PREV to see the rest of the list)



13. We want runway 28R which is number 2 so **type 2 and press ENTER**



14. Press the **LSK** next to **FPL** and you will see runway 28R has been added to the plan (Aerofly will automatically add the final approach fix into the plan (which is always placed 10 nm out of the runway in the runway heading))



15. Press **NEXT** to see the next page of the plan



Press **PREV** to go back again or **NEXT** to cycle through all pages of the plan **Note**- You can also press FPL to do this.

That's it! Now you know how to enter a flight plan manually into the FMS and how to use the LIST and MENU options to add waypoints like VORs or NDBs and even airports and how to add or change departure and arrival runways. This way you can change the arrival runway even during a flight!

Note- the plan in the FMS is linked and 100% the same as the one on the Navigation page so if you can't get things done using the FMS you can always go to the Navigation page and edit/change things there.

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