FRIENDLYPANELS LEARJET 45 FMC MANUAL

For FS9 & FSX

WARNING

This operating manual has been written to be used only with Microsoft® Flight Simulator.

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1. INTRODUCTION

The purpose of this gauge is to implement the FMC style you can find in many of modern airliners or business jets, using the flight plans created with Microsoft Flight Simulator FS9, FSX or any add-on which can export flight plans in the FS format. We have eliminated the complex way in what you have to plan your flight in current commercial FMCs implemented in some of the commercial airliners existing for Microsoft Flight Simulator but keeping the feeling of a real FMC-CDU.

Take into account that you cannot ask the FMC to do what the aircraft cannot do, for example, don't ask the FMC to make the plane climb from 3000 to 18000 feet in a 3 nm flight plan leg at 700 ft/min. Design your flight plan carefully.

A customized map page has been added in order to have a map view of your flight plan.

Some features of this gauge are:

-Follow a flight plan.
-Flight direct to a FLP waypoint (by passing some of them) and continue from there.
-Choose any waypoint in Microsoft database to flight direct to without a flight plan loaded.
-Select an Arrival procedure for destination airport (if it's implemented in Microsoft FS).
-Follow the vertical navigation and IAS desired.
-Display a lot of different information concerning airports and navaids.
-Display information concerning fuel and winds.
-Pass VOR, ADF and COM frequencies from navaids or airports to aircraft radios.
-Map page.
-Etc...

This gauge only use FS data, **you don't need or cannot update AIRAC**.

General description

1. Title of the current page
2. Number of pages of current group
3. Data lines
4. Line select keys and alphanumeric data input
5. Function and alphanumeric keys

Line Select Keys

The CDU display has five Line Select Keys (LSK) on each side of the screen to input or access data. The keys are identified by their position relative to the display and their order from top to bottom. The LSKs are identified as Left or Right and are numbered from 1 to 5 starting at the top. For example LSK R1 is the top right key of the gauge.

The LSKs are used for:
− Access to data or function identified by LSK.
− Input alpha numeric data. Usually you press once to show cursor and once again to input the written data.

Function Keys

They are used as described below to access different pages. Note that if there is not flight plan loaded some pages will not be available or show nothing.

Alphanumeric Keys

They are used to input data. Not all of them are usable. Backspace key is BACK key. You can also use PC keyboard to input data while cursor is blinking in scratchpad line (ATC window must be closed). Note that while cursor is blinking the simulator will not reply to keyboard except to input data, that's to say, if you press G key, will not have any action on aircraft gear, instead, a G character will be written in scratchpad.

Some keys that are not used in this version has been replaced by MAP, RNG+ and RNG- to show and zoom MAP PAGE.

3. PERF PAGE

First of all load a Flight Plan previously made. You have to use a Flight Plan made with FS9 or FSX or any add-on that can export plans to FS format.

Click on PERF button.

This page shows data concerning ground speed, distances, wind, times, temperatures, distances that can be flown per pound of fuel, fuel endurance and distance that can be flown with the fuel on board, as well as fuel remaining after arrival to destination.

4. FLIGHT PLAN PAGES

Main route page appears anytime you press FPL key. Use FS menu to load a previously created flight plan.

You can use PREV and NEXT PAGE buttons to browse through FPL pages.

Active WPT is indicated with magenta colour.

5. DEPARTURE / ARRIVAL PAGE

Click on DEP/ARR button to access this page. Just options for destination airport arrivals are available as they are in default FS.

Click LSK R2 to show available approaches, with right keys select the desired one.

Use LSK L4 or L5 to LOAD or ACTIVATE desired approach, ENTER button will light and, pressing it, you'll finish your selection, CDU will display the first page of the approach selected added to the flight plan.

If you selected LOAD the flight plan will go on normally but you can browse the flight plan pages and see the approach wpts, if you select ACTIVATE the aircraft will fly to the first wpt of the selected approach.

After loading an approach, next time you press DEP/ARR button just ACTIVATE option will be available. If you want to change the approach selected go to DEP / ARR page, click on LSK R1 and repeat the steps described.

If you have activated the approach and wanted to come back to the flight plan, click on HOLD button and select a wpt as explained in section 9.

6. TUNE PAGE

Press TUNE key to display this page. It displays info concerning the two nearest VORs as well as identity and frequency of the nearest NDB. Using LSK of the right and left sides you can send those frequencies to radios NAV1, NAV2 and ADF. COM and transponder frequencies are displayed too.

7. VNAV PAGE

Press VNAV button to show this page. It will display wpts, courses, distances and IAS/ALTITUDES of your flight plan. VNAV data can be set from this page, <u>if VNAV is inactive</u>. Use LSK Right side to input data.

Use PREV and NEXT page buttons to browse through flight plan pages. If an arrival procedure has been loaded it will be shown at the end of normal flight plan pages.

Use numeric keys to input IAS and ALTITUDE data for EVERY wpt (VNAV must be deactivated to do it). If you enter a number less than 1000 it will be considered an IAS in knots, if it is greater than 1000 altitude in feet will be entered when you press the LSK desired in the right side.

First press the desired LSK Right side and the yellow cursor will appear, enter IAS data and press the same key again, press it once more and the yellow cursor will be back, enter the altitude data and press the key: you have completed IAS and altitude data for that wpt.

IASs and ALTs can be automatically calculated by FMC as well. To do it follow next steps:

1. Click on MENU
2. Then LSK L4 (VNAV CALCULATION)
3. Press once LSK R2 and input cruise altitude data when cursor flashes
4. Press LSK R2 once more
5. When ACCEPT appears press LSK L5 and then ENTER.

You'll get a VNAV accurate enough to take you to your destination airport. Anyway, you can change any data using LSK right side keys to input and change data. If VNAV is active you need to deactivate it first.

To activate VNAV once you have introduced VNAV data, press MENU button and then ACT VNAV (LSK R5).

Once VNAV is activated the aircraft will follow VNAV when you press VNAV button in the Autopilot and AP is ON. Data will be passed to aircraft autopilot and it will follow flight plan route (if MCP is in FMS mode and LNAV is ON in AP) as well as vertical navigation, passing the wpt as desired altitude and speeds.

When VNAV is active, LSK R5 option is replaced with VNAV OFF in the DATA page which allows deactivating VNAV and changing waypoints data or simply keeping VNAV deactivated.

8. DIRECT TO PAGE

Click on DTO to show this page. From this page you can choose any waypoint existing in FS database to fly direct to. If you complete this operation with a Flight Plan loaded it will be deleted from FMC and be replaced it for a Direct To flight plan.

Use alphanumeric keys and LSK L1 to enter a wpt, press LSK L5 ACCEPT and then ENTER. If duplicate wpts exist you can select the right one using LSK left keys.

9. HOLD PAGE

Press HOLD button to show this page. From here you can fly direct to a wpt of the flight plan and continue it from there, bypassing intermediate wpts.

Use LSK right buttons to select a wpt, ENTER button will light, press it and NAV page will show displaying data to new next wpt you selected. Once the aircraft reach that wpt the flight plan will continue from there.

10. NAV PAGE

Press NAV button to show this page. Data in this page are selfexplained.

11. INDEX PAGE

Press MENU button to go to index page. Using LSK right or left side you can access different FMC functions described below.

12. POSITION PAGE

Press MENU and POS REF LSK to display this page.

13. NAV DATA OR DATA BASE PAGE

Press MENU and NAV DATA LSK to display this page.

From this page you can access airports and navaids data as well as nearest airports, intersections, NDBs and VORs.

14. AIRPORT IDENT PAGES

In main REF NAV DATA page press AIRPORT IDENT LSK to display this page.

Use alphanumeric keys to input airport ICAO from LSK L1. Now you can use NEXT and PREV pages to look for the data you want to know of the airport selected. From the frequencies pages you can send frequency to appropriate radios using LSK right side keys.

15. NAVAID IDENT PAGES

In main REF NAV DATA page press navaid IDENTs LSK to display this page.

Procedures are similar for INT, VORs or NDBs. The nearest type of navaid identity appears in LSK R1 when you access these pages. Use alphanumeric keys to enter the one you want. Press indicated LSK to enter the navaid. If duplicate navaids exist you will be prompted to choose. If navaid selected has a frequency pressing LSK left side will send the frequency to NAV1 or ADF radios.

16. NEAREST PAGES

In main REF NAV DATA page press LSK R1, R2, R3 or R4 to display the nearest five airports, intersections, NDBs or VORs in their respective pages. Frequencies can be sent to the appropriate radios by means of LSK right side keys.

17. MAP PAGE

Click on MAP button to see this page.

Use RNG+ and RNG- to zoom out or in the map. While in mode map you can filter what navaids are displayed using buttons 1 – 5.

Button 1: Show / hide airports
Button 2: Show / hide VORs
Button 3: Show / hide NDBs
Button 4: Show / hide INTERSECTIONS
Button 5: Show / hide ILSs

18. TUTORIAL

Let's see an step by step example on how to use some of the features of this gauge.
(Screenshots are taken from FS9)

18.1. Load the aircraft and go to Menu Bar, Flights, Flight planner

We select a flight from Amsterdam (Holland) to London (UK).

18.2. Press FPL

You'll see page 1 of flight plan.

LNAV is automatically calculated by FS (GPS navigation) when pressing LNAV button in AP, so you have to do nothing about this. We have to set VNAV and we have two ways to do it:

Press on MENU button, then LSK L4. In the screen prompted input CRZ ALT using LSK L2 then ACCEPT (LSK L5) and then ENTER. VNAV page will be displayed.

Press MENU again and then LSK R5 (ACT VNAV):

VNAV is ready to be used later.

Now go and configure your plane for takeoff. Once you're airborne, to have the FMC working you need:

-Autopilot on.
-FMS in MCP ON.
-LNAV and VNAV in AP ON.

Watch that if you press MENU button again after activating VNAV, ACT VNAV in line five has been replaced by VNAV OFF as described in section 7.

The second way to set VNAV is completely manual. Load the plane and open a flight plan as described above. Then press VNAV function key. You'll be directed to the FPL VNAV page.

Press on the LSK right side of the wpt to change. Data will go blank and the yellow cursor will flash. Enter IAS data manually in the same line by keyboard or alphanumeric keys and press LSK right side again. Repeat the previous steps for altitude (see pictures below).

When you finish entering data follow the steps described above to ACTIVATE VNAV.

NOTE. - FMC doesn't calculate TOP of CLIMB or BEGINNING of DESCENT points

18.3. How to bypass some waypoints and fly direct to a flight plan waypoint directly.

Let's say you're flying to EH014 wpt and you want to bypass OA and Fix01 wpts to fly direct to CLN, and continue flight plan from there.

    a)   Press HOLD function key:

    b)   Press LSK R5 (CLN>). ENTER button will light:

    c)   Press ENTER button and NAV PAGE will be prompted showing you're flying to CLN.

d) Press LEGS or VNAV function key and you'll see the wpt you're flying to in magenta colour.

Once you reach that wpt the flight plan should go on following the rest of the wpts.

18.4. Selecting an arrival

You can select any arrival procedure to destination airport if it is included in internal Microsoft FS database for that airport. To do it, follow the next steps:

a) Push DEP ARR function key. DEP ARR page will be prompted. Then LSK R2:

b) Available approaches will be shown. Press LSK in the right side desired (ILS 27R in this example). LSK R1 line show the approach selected and below are the available types. Press again the LSK key desired (VECTORS in this example):

c) Use LSK L4 or L5 to Load or Activate the approach selected. EXEC or ENTER button will light, press it and the approach wpts will be added to the end of flight plan list. If you choose "Load" aircraft will continue with flight plan, if you choose Activate the aircraft will begin to fly to the first approach wpt. After loading an approach, next time you press DEP/ARR button just ACTIVATE option will be available. If you want to change the approach selected go to DEP / ARR page, click on LSK R1 and repeat the steps described above. If you have activated the approach and wanted to come back to the flight plan, click on HOLD button and select a wpt as explained in section 9.

18.5. Direct To a waypoint

You can fly direct to a waypoint anytime you want. If a flight plan is loaded in the FMC will be deleted, use HOLD function if you don't want that to happen. To flight direct to:

a) Press DTO function key. DTO screen will be displayed:

a) Use keyboard or alphanumeric keys to enter the waypoint. Press LSK L1to activate. WPT data will be shown, or, if there are more than one wpt with the same name, a new screen will show them to allow you to choose. Use LSK L keys to do it:

c) ACCEPT will appear in LSK L5. Press ACCEPT and ENTER to activate this mode and show the PROGRESS DTO page. If FMS in MCP and LNAV in AP are on the aircraft will fly direct to the wpt selected.

19. TECHNICAL SUPPORT

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We will answer as soon as possible.

Web page:

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