

European Aircraft Developer Team *EADT*

# KLN 90B

for X-Plane

# Manual

by *Dennis Prüfer*



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## **1 Introduction**

The KLN 90B is an IFR approach certified GPS device from the early 90s. Despite its age, it's still a very sophisticated device with many features. The features range from basic distance/time calculations to a true moving map.

The KLN 90B can store up to 26 flight plans, which can be automatically flown by the autopilot.

Advanced features include VNAV advisory calculations, custom user waypoints, non-precision approaches and a moving map.

A unique feature of the KLN 90B is the “split screen”. The pilot may choose any combination of pages to be shown at once.

The KLN 90B is being operated by two knobs on either side which control the page of their respective side.

The old-school green screen will give you a nice retro feeling of the early 90s.

Due to its powerful features and its low price, the KLN 90B is still widely used in general aviation aircrafts today.

## **2 About this manual**

The EADT KLN 90B closely simulates the real KLN 90B. Therefore it is best to read the real manual.

The manual can be downloaded directly from Bendix king;

[https://www.bendixking.com/servlet/com.honeywell.aes.utility.PDFDownloadServlet?FileName=/TechPubs/repository/006-08773-0000\\_1.pdf](https://www.bendixking.com/servlet/com.honeywell.aes.utility.PDFDownloadServlet?FileName=/TechPubs/repository/006-08773-0000_1.pdf)

To help you getting used to the EADT KLN 90B simulation quicker, this manual will explain the basic features and the X-Plane differences.

This manual will regularly refer to the real manual for further information. The references to a page from the real manual are indicated by a black outline such as this:

**3-1**

**Please be responsible, neither use this manual nor the EADT KLN 90B for real world training!**

## 3 Installation

### 3.1 First installation

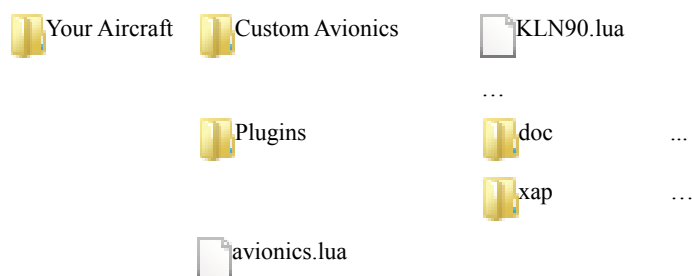
To Install the KLN 90B, you'll first need to copy the folders KLN 90 Navdata and Output into your X-Plane folder.

The folder structures should now look like this:



### 3.2 Install the KLN 90B into your aircraft

The KLN 90B needs to be installed into each aircraft manually. First open the folder of the aircraft you wish to add the KLN 90B to and check if a file named “avionics.lua” exists. If it doesn't exist, copy all files from the aircraft folder into the folder of your aircraft. The folders should look like this:



### 3.3 Modifying the avionics.lua

If the file avionics.lua already exists, you'll need to modify the existing file. But first of all, copy all files from the aircrafts folder as shown above into your aircraft, except for the avionics.lua file

Next open the already existing avionics.lua file with a text editor, and find this entry:

```
components = {
```

All you'll now need to do is to add this line after components = {

```
KLN90 {},
```

Best is to copy and paste the above line to prevent typing errors.

When done, the section of your file looks like this:

```
components = {
```

```
KLN90 {},
```

```
some strange other stuff {},
```

```
more strange other stuff {},
```

```
}
```

If you are unsure, take a look at appendix A, which shows an example avionics.lua file!

Now the installation is finished, fire up X-Plane!

## 4 Controls



1. Reduce brightness
2. Turn power On/Off
3. Increase brightness
4. Toggle left cursor
5. Toggle right cursor
6. Toggle scan mode
7. Turn the left large knob counterclockwise
8. Turn the left small knob counterclockwise
9. Turn the left small knob clockwise
10. Turn the left large knob clockwise
11. Toggle the Message page
12. Toggle the Altitude page
13. Turn on the Direct To page
14. Clear an entry
15. Confirm an entry
16. Turn the right large knob counterclockwise
17. Turn the right small knob counterclockwise
18. Turn the right small knob clockwise
19. Turn the tight large knob clockwise

The left knobs control the left side of the screen and the right knobs control the right side of the screen.

Please refer to page 3-11 of the real manual for more information on the display format.

### 4.1 The display Format

The KLN 90B features a unique „split screen“. Most of the time, the screen is split into two separate pages, which allow you to view any two pages at a time! 3 and 5 are the page annunciations and show you which page you selected. All possible pages are displayed next to each knob (7, 10, 16, 19) in their order.

4 Shows which mode the KLN 90B is in and status line messages.

Please refer to page 3-9 of the real manual for more information on the display format.

## 5 The First Look

You should now know enough to have a first look at the KLN 90B in X-Plane. Start X-Plane and select your aircraft where you installed the KLN 90B into.

If you installed the KLN 90B correctly, you'll see this icon on the upper right corner (you may have to scroll up to see it):



This Icon is a toggle panel which can be used to display and hide the KLN 90B and the MD41 (more about the MD41 later).

It is intended to be placed on a convenient location on the panel. You can drag the panel by clicking and holding the left mouse button on the area marked in green in the above screenshot.

Drag it to a position where it fits nicely. This position will be saved and restored the next time you load the aircraft.



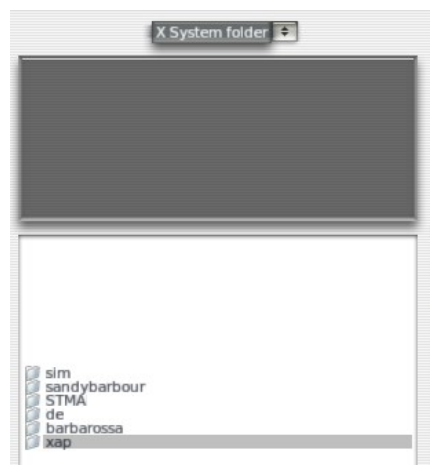
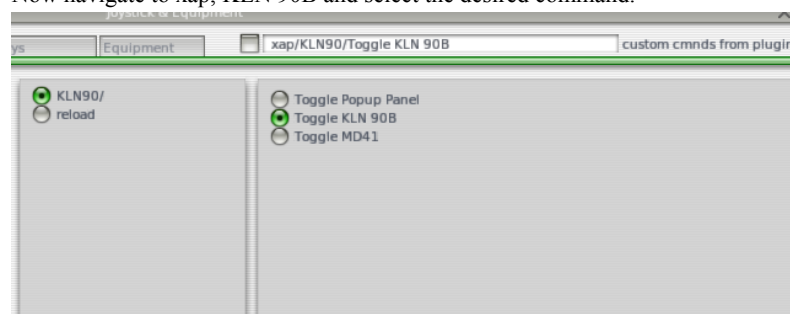
If you don't like this panel, you can close it with the little x on the upper right corner and use commands to show and hide the KLN 90B instead.

Open the menu Joystick, Keys & Equipment which is located in Settings. Click the tab Buttons: Adv and click the button you want to assign the KLN 90B to.



Click the little square on the top right corner and a new window will open. From the drop down menu at the top, select X System folder

Now navigate to xap, KLN 90B and select the desired command.



Now either click on the KLN 90B symbol on the toggle panel or press the command you assigned and the KLN 90B will open. Click on the upper right knob to turn on the KLN 90B and wait until the self test is completed.

You'll now see another test page.

On the lower right corner, you'll see the annunciation „CRSR“. This tells you that you can select and edit values with the right knob. The selected field is indicated by inverse video.

Use the outer right knob to move the cursor over „Approve?“ and press the ENT button.



Press ENT again and you can play around with the KLN 90B. Use the outer knobs to move through the pages. Remember, your current pages are indicated on the left and right side of the last line. All available pages are listed next to the left and right knobs.

Use the inner knobs to switch between the subpages if available.

Just have a look at the available pages, you can't break anything. You'll get more familiar with the KLN 90B during the tutorial flight in chapter 7.

And remember, if you want more information about a specific page, have a look at the real manual!

## 6 The KLN 90B in X-Plane

The EADT KLN 90B simulates the real KLN 90B as realistic as possible. This chapter intends to tell you the differences to the real KLN 90B.

### 6.1 Flight Plans

As you may have noticed during installation, all KLN 90B flight plans are stored in X-Plane/Output/FMS plans/KLN 90B

You may create a flight plan using an external tool and load the into the KLN 90B.

To do so:

Export the flight plan into the X-Plane format and copy it into the folder X-Plane/Output/FMS plans/KLN 90B.

Rename the flight plan to a number between 0 and 25. 0 is the active flight plan, all others are saved flight plans.

Any number above 25 or any other name will be ignored by the KLN 90B.

Only the first 30 waypoints of the flight plan are imported. If your flight plan contains more than 30 waypoints, the last waypoints are ignored.

Always put the flight plan into the X-Plane/Output/FMS plans/KLN 90B folder before the sim is launched! Otherwise it will not be imported into the KLN 90B and it will be deleted when the sim is turned off!

### 6.2 GPS simulation

The EADT closely simulates the GPS system, therefore, the KLN 90B needs some time to find enough GPS satellites for navigation. The time it needs for this is called „Time to first fix“ (TTFF). If the date, time and location of the KLN 90B is correct, the TTFF should not take more than 2 minutes. But if the date, time or location is incorrect, it may take up to 12 minutes until the KLN 90B is ready for navigation.

Therefore, always check the date and time on the selftest page and correct it if necessary.

The data and time should usually be correct, unless you change the X-Plane time after the KLN 90B has been loaded.

The location of the KLN 90B is indicated in the Set 1 page. The location will be the last location the KLN 90B has been turned off. So, unless you move the aircraft after the last time you turned the KLN 90B off, the location should be correct.

For more information on the time to first fix, refer to page **3-17** of the real manual

You can check the progress of the GPS acquisition on the STA 1 page. If it takes unusually long to find each satellite, check if your date, time and location are correct. For more information on the STA 1 page, have a look at page **5-29**.

If you do not like this realistic GPS simulation, you may turn it off on the SET 10 page. Check chapter 6.4 for more information.



## 6.3 The SET 10 page

The EADT KLN 90B includes a fictional SET 10 page which allow you to change various settings of this simulation.

### KLN90B:

Here you define if the KLN 90B is the primary GPS device in the current airplane.

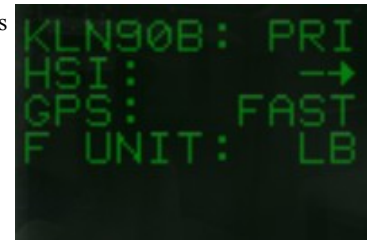
Primary: The KLN 90 will drive the HSI, the autopilot and an external moving map if available

The default GPS/FMS will be unusable

Secondary: The HSI and the autopilot will be driven by the default GPS/FMS

The KLN 90B will not provide any outputs.

Normally, you'll want to have the KLN 90B primary. However, if you wish to use the default GPS/FMS or to prevent add-on incompatibilities, set the KLN 90B to secondary.



### HSI:

If the KLN 90B is primary, you can choose here how the KLN 90B interfaces with the HSI.

- : The KLN 90B can not read what is displayed on the HSI. It will still show the deviation if the aircraft has an HSI. This setting should be used if your aircraft does not have an HSI.
- : The KLN 90B can read what is displayed on the HSI, but it cannot write to it. It'll alert you if a wrong course is set to the HSI. This option is most typically found.
- ↔: The KLN 90B can read and write to the HSI. It'll automatically set the course of the HSI. This interface is normally found only on EHSIs.

### GPS:

Here you can change if you want a realistic GPS or a fast GPS simulation.

Fast: The KLN 90B will immediately be ready for navigation once it's turned on

Realistic: It takes some time until the KLN 90B finds enough satellites for navigation. Refer to chapter 6.2 for more information on the GPS simulation

### Fuel Unit:

The OTH 5 – OTH 8 pages display fuel information. The unit shown is usually defined by the installed fuel computer. In the EADT KLN 90B, you can set the unit on the SET 10 page.

GAL: Gallons

IMP: Imperial Gallons

L: Liters

KG: Kilograms

LB: Pounds

For more information on the OTH 5 – OTH 8 pages, refer to page [5-39](#).

### VNAV Pause:

Some simmers have the odd habit of mowing the grass in their garden while flying. If you worry that you may come back late, you can enable VNAV pause. Simply arm VNAV on the NAV 4 page and the sim will be paused at VNAV alert (1:30 minutes before reaching VNAV).

Do not use this feature when flying online! VNAV pause is disabled every time you turn off the KLN 90B, you must re-enable it every time you wish to use it!

## 6.4 Features not simulated

The OTH 1, OTH 2 and CTR pages are not simulated. The pages display airspaces and FSS frequencies, which are not applicable for X-Plane.

## 6.5 Updating the Nav Data

The nav data is provided by Navigraph. To update the nav data, go to [www.navigraph.com](http://www.navigraph.com) and buy credits for the current cycle.

Updating is a two step process:

1. Download the EADT KLN 90B navdata from Navigraph and put the files into the folder „KLN 90 Navdata“ which is located in the X-Plane main folder. If you are using a Mac, make sure you only replace the individual files, not the whole folders!
2. Launch X-Plane and start the KLN 90B. Go to the Set 0 page, press the left cursor and acknowledge each page.

Note: It may appear as if X-Plane freezes while the data base is being erased. This is normal and X-Plane will work correctly again after a few seconds.

After the KLN 90B has finished the update process, the data base will be current again. This update process needs to be done only once, all aircrafts will have an updated data base now.

For more information on the update pages, check page 2-4 of the real manual. Please note that the update time has been reduced in the EADT KLN 90B from ten minutes to just a few seconds for the sake of convenience.

Note: The Navigraph data base is much more complete than the X-Plane database. The KLN 90B may show airports, VORs, NDBs and Intersections which do not exist in X-Plane.

## 6.6 Software Version

The software version of the EADT KLN 90B simulation can be found on the STA 3 page in the fifth line.

## 6.7 MD 41

The EADT KLN 90B also includes the MD 41 annunciator panel.



The use of the MD41 is optional, but it provides some nice help.

The first button switches between Nav 1 and GPS as HSI and autopilot output. Above this button is the annunciator which show which mode is active.

The second button is used to arm and cancel the approach mode. This mode is currently not simulated in the EADT KLN 90B.

The third button switches between the leg mode and the OBS mode. The currently active mode is annunciated above this button. Check page 5-32 in the real manual for more information on the OBS mode.

The right window indicates if you got a message or if the waypoint alert is active.

Press the right button to test if the lamps are working.

## 7 Simple Tutorial Flight

This tutorial flight will teach you the basic features of the KLN 90B. The flight will bring you from EDDH Hamburg to EDDV Hannover and should not take more than an hour. The example flight uses the default King Air B200, but you are free to choose a similar aircraft. Our speed will be below 250 knots and our cruise altitude will be 4500ft.

This tutorial might be a little fast at some times, remember to pause the simulation and read the next section in advance. You can even operate the KLN 90B while the sim is paused!

Start X-Plane, load your aircraft and place it at EDDH.

Turn on the KLN 90B and wait for the selftest page. Check that the date and the time is correct, then approve this page and the database page.

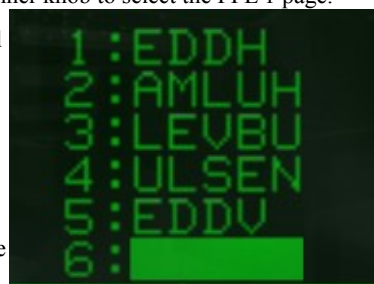
You probably didn't turn the KLN 90B off in EDDH the last time, use the left outer knob to go to the SET 1 page. Turn the left cursor on and make sure the cursor is over WPT. Use the inner left knobs to enter the identifier EDDH, the outer knob is used to select the character. Press ENT to bring up the waypoint page for EDDH. If you made a mistake, press CLR to try again, else press ENT to confirm the waypoint page.



Confirm the changes and you'll see that the initial position has been updated. The time until the KLN 90B is ready should not take longer than 2 minutes now. After some time, MSG will flash in the status line. This indicates that you got a new message. Press MSG on the KLN 90B to view the messages. You'll be notified that your position changed by more than 2NM. Press MSG again to approve the message.

Next enter the flight plan. Use the left outer knob to go to the FPL page and use the left inner knob to select the FPL 1 page.

Turn on the left cursor. And enter EDDH the same way as you did on the SET 1 page and confirm. Next enter the second waypoint "AMLUH". You'll notice that the H will automatically appear as soon as you entered the U. Repeat this process for "LEVBU", "ULSEN" and "EDDV".



Your flight plan should now look as shown on the right picture. The flight plan is stored as as flight plan 2 and can be used anytime you need it. Let's active the flight plan. Use the left out knob to place the cursor over "USE?". Make sure that you don't select "USE? INVRT?", because the flight plan would be active inverted (EDDV-EDDH). So, when the cursor is over USE?, press ENT and the flight plan is now active.

You'll now see the FPL 0 page, the active flight plan is always 0. If the KLN 90B is ready for navigation, you'll also see an arrow indicating your current leg.

Use the right outer knob to select the D/T page. This page tells you that the EDDV is 93NM away along the flight plan. The estimated time enroute (ETE) is currently blanked out, because the aircraft is not moving yet.



Next, display the Super NAV 5 page. First use the left outer knob to select the NAV page, then use the left inner knob to select the NAV 5 page. Do the same with the right page, first use the right out knob to select the NAV page, use the right inner knob to select the Super NAV 5 page. You'll see that this page is different than the others. The screen is not split anymore, a moving map fills the whole screen. The range is set to 40NM as indicated in the lower left corner. Turn the left cursor on and change the range to 1NM. You'll now see the runways at your airport! You can turn the right cursor on and a new window will open. Move the cursor to the last field to change the map orientation if you wish.

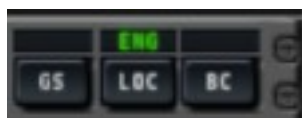


Before takeoff, you should not forget to set the HSI source to GPS if your aircraft is equipped with and HSI. You may either use the MD41 for this or another build in switch as shown on the right. Also make sure that the correct course is set on the HSI. You can now taxi to runway 05 and take off.





After takeoff, increase the map range. You'll see that you deviated from your course while you followed the runway heading. This is a good opportunity to test out the Direct To feature. Simply press the Direct To button on the KLN 90B, the field will already show AMLUH. Confirm with ENT and you'll see that the deviation from the course has been centered. The GPS will bring you from your current position directly to AMLUH and then join the flight plan again.



You may now engage the autopilot. It might be labeled LOC, NAV or LNAV in your aircraft. The autopilot will automatically follow the course.

Now that you got your hands free, you can check out some other cool pages. Make sure the NAV 1 is still being displayed on the right side and use the left inner knob to display the NAV 1 page on the left side, too. Another surprise! You are now on the Super NAV 1 page. It displays the same information as the normal NAV 1 page, but it stretches it to the whole screen for better readability. The first line indicates that you go direct to AMLUH now, next follows a deviation indicator. The maximum deviation is usually 5 NM to either side. The distance, ground speed, ETE and BRG are also shown, which you may have already noticed on the super nav 5 page.



At about 2 NM to AMLUH, you'll see the arrow before AMLUH flashing and also WPT will flash on the MD 41. This warns you that a turn will follow soon. As soon as it stops flashing, you should turn (the autopilot will do it automatically for you).



The D/T 3 page show you the next desired track (DTK). Notice that the format of the D/T pages changes when the left page doesn't show a flight plan. When the turn is initiated, you'll also get a message which tells you the new course.

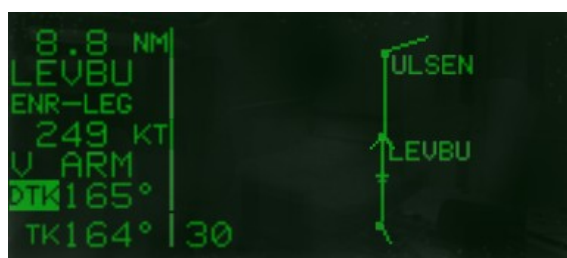
Let's check out the NAV 3 page now. If you forgot to change the HSI course, DTK will flash to remind you to change it. The fourth line shows your cross track deviation (XTK) in numbers. MSA shows

you the safe altitude at you current position and ESA shows the safe altitude along your route. So in this case, fly at least 2500FT high to stay clear of all mountains.



Let's have a look at the NAV 4 page. You may open it with the right cursor, or even better with the ALT button on the KLN 90B. Press the alt button now. On the left page, you should set your current altimeter setting. Altimeters usually output pressure altitude, so you'll need to input the baro setting for the KLN 90B, so it can calculate the indicated altitude. The baro unit can be changed on the SET 7 page. Whenever you change your baro setting, don't forget to change it in the KLN 90B, too!

The right page allows to calculate VNAV advisories. Enter a selected altitude of 1000 FT and move the cursor to the next line over the second digit and change it to a 5. That will tell the KLN 90B that you want to reach 1000FT 5NM before EDDV. When you move the cursor over the angle, VNAV will be armed. Change the angle to 3.0°. The top line will indicate that VNAV is armed. The KLN 90B will now alert you when you have to descend.



Press ALT again to leave the page and open the Super Nav 5 Page again. There are more features to explore here! Press the left cursor and decrease the range. Between 1 and 1000, you'll see AUTO. AUTO will automatically select a range so that you can see your next and the following waypoint. Use the left outer knob to move the cursor over ETE. With the left inner knob, you can also display XTK or VNAV information. Leave it at VNAV for now, you'll see that VNAV is armed. This line will also indicate when you should descent. You can also change the information from line 6 and 7.



You used the right cursor before to change the map orientation of the Super Nav 5 page. You can also display airports, NDBs and VORs here. If needed, you can quickly declutter the screen by pressing CLR.

After LEVBU, line 5 will probably show the time until you should start your descent. You would normally enter the STAR and approach now, but I'll show you another trick.

After passing ULSEN, set the autopilot to HDG and set the heading course to 210. Next use to left knobs to select the MOD 2 page. This page allows you to select the OBS mode. Press ENT to active this mode. You can alternatively press OBS/LEG on the MD41. In the OBS mode, you can select a radial to any waypoint, much like a VOR! Please keep in mind, that automatic waypoint sequencing will be disabled in OBS mode (Useful for holdings!). Use Direct To to switch to the next waypoint. The OBS mode is introduced in page 5-32 in the real manual.

Use the HSI to select radial 272. You'll now see an extended runway centerline on the map! The HSI will display the deviation from the runway. The center of the OBS is still the airport and not the runway, therefore use it as a rough guidance only!



Now watch the indication on the HSI and when you are close to the radial, turn the autopilot back to LOC/NAV/LNAV and the KLN 90B will hold that radial for you. You'll also have to watch the VNAV annunciation, 90 seconds before descent, you'll get a message. When the timer reaches 0, you should start the descent. The VNAV annunciation will now display an advisory altitude which you should fly at.

By now you should see the runways of EDDV. Turn off the autopilot and aim for runway 27R and land visually. One last advice: Set the Super NAV 5 range to AUTO and it'll automatically zoom in during approach, so that you can see the runways.

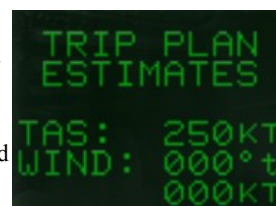
Taxi to your parking position and turn the KLN 90B off. Congratulations, you just made your first flight with the KLN 90B! You should now be able to use the most important features of the KLN 90B. Of course there are many more features to explore, I'd suggest you to have a look at the real manual now and find out more.

## 8 Advanced Tutorial Flight

The second tutorial flight assumes that you have already done a few flights with the KLN 90B and you are familiar with it's basic functions. This tutorial flight will teach you how to use the TRIP planning page, SID/STAR and approaches and other advanced features.

First, let's plan our flight. That's where the TRIP planning pages come in helpful. Simply turn on the KLN 90B and select the TRI 0 page. You don't need to be at a specific airport and you also don't need a valid GPS signal yet.

In the TRI 0 page, you can enter the values for your flight. I'm flying the King Air B200, so my TAS will be around 250 knots. I recommend to fly without weather for now, so enter 0 for the windspeed and heading.



Next select the TRI 3 page (the TRI 1 and TRI 2 pages allow you to plan a flight from you current position). On the TRI 3 page, you can plan a flight from any waypoint to any other waypoint. Let's choose San Diego (KSAN) to Los Angeles (KLAX). Turn on the left cursor and enter both waypoints. The TRI 1 page will now display information for this route. The distance between the airport is 95nm, the direct course is 307°. The cursor will now be at the GS, which is calculated by the entered wind on the TRI 0 page. You may change it manually though. The ETE is displayed next to it.



Move the cursor to the FF field. You can enter you estimated fuel flow here. For the King Bir B200 I enter 1000 LB/H. The unit doesn't matter here. Next Enter an appropriate reserve, I choose 500LB. Line 6 will now display the required fuel for this route. Remember that this is just for a Direct To, we'll need more fuel after we built our flight plan!

Now it's time to move to the aircraft to KSAN.

Enter this route in the FPL 0 page: KSAN JLI KLAX

Next will be this SID. Go to the APT page and enter KSAN. Next move to the APT 7 page. If there is a +, it means that there is an APT 7 page for SID and for STAR, so make sure that line 2 reads "select SID". Turn on the right cursor, select POGGI2 and press enter. You can now select a SID transition, choose JLI.

The KLN 90B will now present a list of waypoints which make up the SID. Compare them with the charts, move the cursor over line 6 and load them into the flight plan. SID/STAR and approaches are always loaded into FPL 0!

You'll now receive a message which tells you that you have redundant WPTS in the flight plan, so let's check FPL 0. You'll see the name of the SID between the first two waypoints. If you select it, you can change or delete this SID. Waypoint 6 and 7 are both JLI. Waypoint 6 has a dot in front of it, which says that it's a waypoint from the SID or STAR. You can delete this waypoint now. When deleting a waypoint from a SID, it does not change how the SID is stored in the database.

You can now enter the STAR for KLAX. Enter KLAX in the APT page and select the APT 7 STAR page. Select OCEAN2. The KLN 90B will now ask for a runway, select 06L. Again, confirm the waypoints and load them into the flight plan. Just as before, delete JLI from the STAR.

R06L-KLAX  
1 MERMA-i  
2 NATHN  
3 ALISN-f  
6 AMTRA-h  
LOAD IN FPL

Finally, we need an approach. Select the APT 8 page and choose RNAV Z 06L. For the IAF, you can select MERMA, the last waypoint of our STAR. You'll now see the waypoints again, but this time there are new symbols. After MERMA, you'll see an -i. This means, it's the IAF. ALISN if the FAF, RW06L is the MAP and AMTRA is the MAHP (more about this later). Load this approach and you'll have to remove a redundant waypoint again. If you attempt to remove MERMA from the approach, you'll see that it's not possible. You can only edit SIDs and STARs, but not approaches. Therefore approach waypoints don't have a dot in front of them. So delete MERMA from the STAR.

You'll now have a flight plan consisting of 20 waypoints which are only part of the SID, STAR and approach. With an enroute portion, you'll quickly reach the limit of 30 waypoints, then you can remove waypoints which you have already passed.

Our route is finish, let's go to the TRI 5 page, The FP 0 is already entered here and you can see that the route is now 250NM long (including missed approach). The fuel required is now significantly larger. You can now load this fuel. Don't turn the KLN 90B off now, because the SID/STAR and approach would be deleted from the FPLN if you turn the KLN 90B off.

FP 0 250NM  
KSAN -KLAX  
250KT :59  
FF: 01000.0  
RES:00500.0  
F REQ 1499 N↑ 80  
TRI 5 ENR-LEG NAV 5

Flight planning is complete now, take off and turn on the autopilot so you have time for reading. You'll see that the autopilot will overfly JETTI first before turning to LOWMA, this is because it is stored as an overfly waypoint.

However, you'll notice that the SID and STAR procedures are very simplified in the KLN 90B. For example flying a certain track is missing and altitudes are not used at all. Therefore it is important to have your charts ready and you may need to fly manually certain portions of the SID and STAR.

Anyway, POGGI2 is an RNAV SID and can be completely flown by the autopilot, you'll only have to take care about the altitude yourself. After BIGJO you'll receive a new message: "Press alt to set baro". This is an indication that the approach mode has been armed. This occurs when you are within 30 nm from the reference airport (KLAX). Check the mode annunciation and you'll see ARM-LEG. The sensitivity of the deviation bar will now be +-1NM.

Open the Super NAV 5 map before reaching MERMA. This page is especially useful for approaches. You'll see the -i after MERMA again, indicating that it's the Initial Approach Fix (IAF). After NATHN it'll become interesting. ALISN is the Final Approach Fix (FAF). When you are two NM away from the FAF, the KLN 90B will go into approach active mode. For this, you must make sure that you are in the LEG mode, not in the OBS mode! In the approach active mode, the sensitivity of the deviation bar will be +-0.3 NM. GPS approaches are only allowed in the approach active mode, so make sure that it is active.

KSAN  
SELECT SID  
1 BRDR5  
2 LNSAY2  
3 PEBLE3  
4 POGGI2  
FPL 0 ENR-LEG ENT ORSR

KLAX  
SELECT STAR  
6 MOOR3  
7 OCEAN2  
8 OLDEE1  
15 VISTA2  
ORSR ENR-LEG ENT ORSR

1:KSAN  
POGGI2-SID  
2:JETTI  
3:LOWMA  
4:PGY  
20:KLAX

ARM-LEG

1.8 NM  
ALISN-f  
APR-LEG  
154 KT  
ETE :00  
DTK069°  
TK069° 10  
KLAX  
RW06L  
SHILY  
NATHN

After ALISN, you'll fly to the Missed Approach Point (MAP), RW06L. The KLN 90B will not sequence past this waypoint (as indicated in the FPLN). If you have to go around, simply press the Direct To button and the waypoint after the MAP will be visible.

A landing at KLAX concludes this tutorial. I hope you have had as much fun as I had!

## 9 Credits

A big thank you to **Theo Gregory**, who created the background textures for the KLN 90B and the MD41!

Theo Gregory is part of the Leading Edge team, check out his products on X-Aviation:

[http://www.x-aviation.com/catalog/index.php?cPath=21&sort=2a&filter\\_id=18](http://www.x-aviation.com/catalog/index.php?cPath=21&sort=2a&filter_id=18)

A second big thank you to **Javier Cortés**, he provided much help and is a good friend of mine.

Check out his FMC at EADT:

[ufmc.eadt.eu](http://ufmc.eadt.eu)

Another big thank you to **Alexander Babichev** (asso), author of SASL!

A final thank you to **Benedikt Stratmann**, founder of EADT and author of the great x737:

<http://www.eadt.eu/>

If you want to share the EADT KLN 90B or parts of it, modified or unmodified, please ask me for permission first.

If you are an aircraft author and you want to include the EADT KLN 90B in your aircraft, please ask me for permission.

You can contact me at x-plane.org, my username is "Falcon". Or you may send a mail to [dennis@xplanefreeware.net](mailto:dennis@xplanefreeware.net).

## Appendix A. Example avionics.lua

Only the location of the red bold line is important, ignore the other lines!

```
size = { 2048, 2048 }

createProp("sim/custom/xap/wingwalker/left_foot", "float", 2);
createProp("sim/custom/xap/wingwalker/right_foot", "float", 0);

-- window size issue for panels
defineProperty("window_height", globalPropertyi("sim/graphics/view/window_height"))
local coef = get(window_height) / 1024
if coef > 1 then coef = 1 end -- set initial coefficient for float panel's size - make
'em smaller, if screen resolution less then 1024 by height.

defineProperty("closeImage", loadImage("close.png")) -- close cross image
local a = createCommand("xap/wingwalker/figure1", "figure1")
a = createCommand("xap/wingwalker/figure2", "figure2")
a = createCommand("xap/wingwalker/cockpit", "cockpit")

wingwalker_panel = subpanel {
    position = { 50, 50, 1024 * coef, 104 * coef };
    noBackground = false;
    noClose = true;
    components = {
        wingwalker_panel {
            position = { 00, 0, 1024 * coef, 104 * coef },
        };
        textureLit {
            position = {(1024 - 16) * coef, (104 - 16) * coef, 16 * coef, 16 * coef},
            image = get(closeImage),
        };
    };
}

components = {
KLN90 {},
wingwalker {},

panel_logic {
    panel_1 = wingwalker_panel,
},
}
```