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1. BENDIX KLN 94 GPS NAVIGATION SYSTEM



The KLN94 has two knobs and eleven buttons. The bottom left little knob is only used to turn on/off the gauge.

The outer right knob is used to select the pages group that can be displayed in the screen or to manage cursor. Inner right knob allows you moving trough pages inside a group.

The KLN 94 uses a color LCD. In normal operation, the display screen is divided into four segments. When the map page (NAV 4) is displayed the page bar is removed to maximize the height of the map.

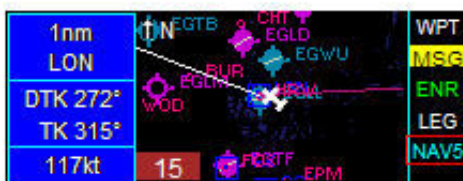


Figure 1

The top line of segment 1 always displays distance to the active waypoint. The identifier of the active waypoint is usually displayed on the second line. In cases when the active waypoint identifier is displayed on a segment 2 page, line 2 will display the current groundspeed. The third line of segment 1 displays the desired track (DTK). When the KLN 94 is in OBS mode of operation the OBS course is displayed on line 3. The aircraft's actual track (TK) over the ground is displayed on line 4.

Segment 2 shows aeronautical information in the form of pages, as described later ahead.

Segment 3 displays specific page type and number, which is shown on the page bar at the bottom of the display. Seven page types are shown on the page bar, however; only the selected page type is shown in reverse video (white characters on a blue background). In figure above, the NAV1 page is being displayed in segment 2 and is annunciated as such on the segment 3-page bar.



Segment 4 displays annunciations associated with the unit. Line 1 shows the WPT (waypoint alert) annunciation when approaching the active waypoint. Line 2 shows the message prompt, a large "M", when the KLN 94 has a message for you to view on the message page. Line 3 displays the ENR, TERM or APR. Line 4 will normally display "LEG" which is the default mode. "OBS" is displayed when the pilot has selected the OBS mode. A Line 5 will appear in map modes to show the page you're in NAV4 or NAV5

1.1 Clicking areas



1. Shows/Hide procedures page
2. On / Off
3. Shows/Hide message page
4. OBS or LEG mode
5. Shows/Hide ALT pages: pushing once displays ALT 1 page, twice ALT 2 page and third time return to NAV 1 page.
6. Show nearest group pages
7. Shows/Hide Direct To page or activate LEG in loaded Flight Plan.
8. Clear screen and shows super NAV1 page. Keep it pushed till it happens
9. Confirm options or enter data
- 10 and 13. Change page group shown. Move cursor
- 11 and 12. Change page inside a group. In FPL mode shows DIS, ETA, ETE or DTK to waypoints
14. Shows/Hide Menu. In addition to the normal way of selecting pages with the right knobs, the NAV 4 page may be instantly displayed by pressing either the map range (16) button or the menu (14) button.
15. Turn on/off cursor
16. Zoom in/out map.

1.2 The NAV pages

When you first turn on the KLN94 a self-test page is displayed, followed by another display screen with data concerning your current position. Push ENT key to accept and you'll go into NAV1 page. Use the right inner knob to move through this NAV group.

1nm	EGLC → LON	WPT
0kt	0.40nm> :5.0nm	OFF
DTK 272°	VNAV Off	ENR
TK 315°	289°To 00:00	LEG
APT VOR	NDB INT NAV 1 FPL	AUX

also displayed on line 3. This is the full-scale deviation. The CDI scale factor is ± 5 NM which means each dot represents 1 NM of deviation off course. Line 4 shows VNAV status (not implemented). Line 5 displays a data field which display bearing to the active waypoint (**To**). Line 5 also displays the estimated time en route (ETE) from present position to active waypoint.

NAV1: Segment 1 (refer to Figure 1 above) has been described above. Segment 2 displays active navigation leg in Line 1. Line 2 is a course deviation indicator (CDI) that graphically displays left and right deviation from desired course. Line 3 displays numeric crosstrack correction, the crosstrack distance (how far off course) and direction to fly to intercept the desired track. The numeric crosstrack correction distance display is especially handy when more than five nautical miles off of course. The CDI scale factor is

NAV2: displays the aircraft's present position: the radial and distance from a nearby VOR and current latitude and longitude of the aircraft.

1nm	PRESENT POSN	WPT
LON	Ref: LON	OFF
DTK 272°	291° To 1.4 nm	ENR
TK 315°	N 51°28.91'	LEG
	W 000°25.94'	
APT VOR	NDB INT NAV2 FPL	AUX

NAV3: The Navigation 3 page shows you several important times pertaining to your flight. Line 1: The current local time. Line 2: The time of departure. This is the time when a valid groundspeed was first greater than 30 knots (typically during takeoff). Line 3: The elapsed flight time, which will be the hours and minutes since the departure time. Line 4: The estimated time en route to next waypoint. Line 5: Estimated time of arrival (ETA) to next waypoint.

1nm	Time	LCL	10:18	WPT
LON	Depart		10:11	OFF
DTK 272°	Flight		00:07	ENR
TK 315°	ETE LON		00:00	LEG
	ETA LON		10:18	
APT VOR	NDB INT NAV3 FPL			AUX

NAV4 and 5: Segment 2 displays map, with different orientation: track or north, flight plan route and nav aids.

1nm	↑ TK	BUR	WPT
LON		CHT	OFF
DTK 272°		EGLD	ENR
TK 315°		EGWU	LEG
0kt	10		NAV4

1nm	↑ N	EGWU	WPT
LON		BUR	OFF
DTK 272°		GLM	ENR
TK 315°			LEG
0kt	10		NAV5

You can select, while in NAV4 or NAV5, what nav aids you want to be displayed in the map. To do this push MNU, the MAP-DATA will appear, then use outer right knob to select the type of nav aid and inner right knob to select nav aid ON (displayed) or OFF (hidden). Then push MNU again.



1.3 The Airport, Intersection, NDB and VOR pages

There are ten pages in this group: 6 APT, 2 INT, 1 VOR and 1 NDB displaying info about their respective facilities. You can use the outer and inner knob and CRSR to manage through them. Here are a few screenshots.

1nm	EGLL Public	80 ft	WPT
LON	Heathrow		OFF
DTK 272°	London		ENR
TK 315°			LEG
APT 1 VOR NDB INT NAV FPL AUX			

1nm	EGLL		WPT
LON	N 51°28.65'		OFF
DTK 272°	W 000°27.68'		ENR
TK 315°	262° To	1.1nm	LEG
APT 2 VOR NDB INT NAV FPL AUX			

1nm	EGLL		WPT
LON	09R-27L		OFF
DTK 272°	11978ft	HRD L	ENR
TK 315°			LEG
APT 4 VOR NDB INT NAV FPL AUX			

1nm	EGLL		WPT
LON	Approach	119.73	OFF
DTK 272°	Approach	120.40	ENR
TK 315°	Approach	127.53	LEG
APT 5 VOR NDB INT NAV FPL AUX			

1nm	EGLL		WPT
LON	ILS 09L		OFF
DTK 272°	VECTORS		ENR
TK 315°			LEG
APT 6 VOR NDB INT NAV FPL AUX			

1nm	D093A		WPT
LON	Ref: BVS		OFF
DTK 272°	Rad: 324°		ENR
TK 315°	Dis: 157.3nm		LEG
APT VOR NDB INT 2 NAV FPL AUX			

1nm	HRW	424.0	WPT
LON	HEATHROW/LONDON		OFF
DTK 272°	N 51°28.73'		ENR
TK 315°	W 000°27.57'		LEG
APT VOR NDB INT NAV FPL AUX			

1nm	LON	113.60	WPT
LON	LONDON		OFF
DTK 272°	N 51°29.23'		ENR
TK 315°	W 000°28.00'		LEG
APT VOR NDB INT NAV FPL AUX			

From these pages, anytime you highlight a frequency (using right CRSR and knob), it can be sent to the NAV1 COM radio or ADF clicking on ENT button.

1nm	EGLL		WPT
LON	Approach	119.73	OFF
DTK 272°	Approach	120.40	ENR
TK 315°	Approach	127.53	LEG
CRSR APT 5 *CRSR*			

1.4 The Nearest pages

Push NRST button to access this five pages group (or use the outer knob until you find this page) which displays info about their respective nearest facilities. You can use the outer and inner knob and CRSR to manage through them. Here is a couple of screenshots.

1nm	NRST Airspace	WPT
LON	LONDON CTR	OFF
DTK 272°	Inside of airspace	ENR
TK 315°	LONDON/CITY CTR	LEG
APT VOR	NDB INT NAV FPL	N APT

1nm	NRST Airports	WPT
LON	EGLL 12776ft	OFF
DTK 272°	265° 1.2nm	ENR
TK 315°	EGWU 5515ft	LEG
	011° 4.4nm	
APT VOR	NDB INT NAV FPL	N APT

1.5 The Auxiliary pages

This pages group has three pages and shows additional information. Use the outer knob to reach them and inner knob to browse them.

1nm	AIR DATA (1/2)	WPT
LON	TAS 0kt	OFF
DTK 272°	Mach 0.04	ENR
TK 316°	Headwind 10kt	LEG
	Wind 29° 23kt	
APT VOR	NDB INT NAV FPL	AUX 1

1nm	AIR DATA (2/2)	WPT
LON	SAT 11°C	OFF
DTK 272°	TAT 11°C	ENR
TK 316°	Prs 1824ft	LEG
	Den 1829ft	
APT VOR	NDB INT NAV FPL	AUX 2

1nm	FUEL DATA	WPT
LON	Endur 5 : 37	OFF
DTK 272°	Range 612nm	ENR
TK 329°	nm / gal 6.8	LEG
	Res 90 GL	
APT VOR	NDB INT NAV FPL	AUX 3

AUX1: Line 1 displays True Air Speed, Line 2 MACH speed, Line 3 tailwind speed (TWIND) or headwind speed (HWIND) and Line 4 wind direction and speed.

AUX2: Line 1 displays static air temperature, Line 2 total air temperature, Line 3 pressure altitude and Line 4 density altitude

AUX3: displays fuel data: Line 1 endurance, Line 2 range, Line 3 nm per gallon for current condition and Line 4 fuel left.

1.6 The Direct To page

Push Direct To button to show this page. In segment 2 you can see and select the Facility to Direct To and its data. Enter data desired and press ENT until you see the WPT data page. Then confirm pushing enter again. You can cancel this operation by pushing CLR or CRSR.

103nm BLN	DIRECT TO:		OFF
DTK 077° TK 080°	KRSW		ENR LEG
CRSR	DIRECT TO	*CRSR*	

103nm BLN	KRSW 3828.4nm Southwest Florida Int290° Ft Myers, Florida	ENT
DTK 077° TK 080°		ENR LEG
CRSR	DIRECT TO	*CRSR*

1.7 The Flight Plan page

Use the outer knob to get to the Flight Plan List page. CRSR and outer knob allow you scrolling through this page. Inner knob let you change the information displayed in the right column: Distance, ETE, ETA or DTK to waypoints.

16nm	0.EGLC	Dis	
175kt	1.BPK	16	OFF
DTK 343°	2.GAM	113	ENR
TK 278°	3.EDN	294	LEG
	4.EGPH	297	
APT	VOR	NDB	INT NAV FPL AUX

16nm	0.EGLC	ETE	
175kt	1.BPK	:05	OFF
DTK 343°	2.GAM	:33	ENR
TK 278°	3.EDN	1:02	LEG
	4.EGPH	:01	
APT	VOR	NDB	INT NAV FPL AUX

16nm	0.EGLC	CDT	
175kt	1.BPK	18:44	OFF
DTK 343°	2.GAM	19:18	ENR
TK 278°	3.EDN	20:20	LEG
	4.EGPH	20:21	
APT	VOR	NDB	INT NAV FPL AUX

16nm	0.EGLC	DTK	
175kt	1.BPK	343°	OFF
DTK 343°	2.GAM	347°	ENR
TK 278°	3.EDN	340°	LEG
	4.EGPH	247°	
APT	VOR	NDB	INT NAV FPL AUX

From these pages you can choose to select to fly Direct To a FPL waypoint and then continue the FPL from there. To do this, press CRSR, use outer knob to browse to the desired waypoint, press DTO button and then enter. Below is the sequence to change to EDN wpt instead of the current BPK:

16nm	0.EGLC	CDT	
175kt	1.BPK	18:44	OFF
DTK 343°	2.GAM	19:18	ENR
TK 278°	3.EDN	20:20	LEG
	4.EGPH	20:21	
CRSR	FLIGHT PLAN	*CRSR*	

16nm	DIRECT TO:		
175kt	EDN		ENT
DTK 343°			ENR
TK 278°			LEG
APT	VOR	NDB	INT NAV FPL AUX

16nm	0.EGLC	CDT	
175kt	1.BPK	18:44	OFF
DTK 343°	2.GAM	19:18	ENR
TK 278°	3.EDN	20:20	LEG
	4.EGPH	20:21	
APT	VOR	NDB	INT NAV FPL AUX

You can cancel pressing DTO button before pressing enter or with CLR.

1.8 The Message page

Push MSG button to show/hide message page. It displays Airspaces Alert messages if any. A blinking M alert will show in segment 4 if there is a message. This blinking alert can be inhibited keeping MSG button pushed until the M letter in segment 4 change to OFF. To recover the alert mode keep pushed MSG again until M letters appear.

16nm	*Airspace Alert	
175kt	Inside Airspace	OFF
DTK 343°	Airspace ahead —	TER
TK 278°	Press MSG to continue	LEG
	* MSG *	

1.9 The Procedures page

Push PROC button to show/hide procedures page. CRSR and knob allow you to manage these pages.



1.10 The ALT page

Push ALT button to show/hide Altitude pages. Pressing once displays ALT 1 page, twice ALT 2 and a third time goes to NAV 4 page, whatever was the page you were before.



ALT 1 always shows Baro Pressure highlighted because you can change with the outer knob the baro setting from this page. Minimum Safe Altitude and Minimum Enroute Safe Altitude are not available in this version.

ALT 2, as Vertical Navigation page is not implemented in this version, shows the current altitude, the autopilot selected altitude, next waypoint and distance to it, ground speed and current vertical speed.

2. BENDIX KLN90B GPS NAVIGATION SYSTEM



The KLN90B has three knobs and seven buttons. The top right little knob is only used to turn on/off the gauge.

The left knob is used to select the pages group that can be displayed in the left side or the full screen (NAV group, OTHER group and Flight Plan page); it manages the cursor for these pages and the Direct To pages as well.

The right knob is used to select NAV pages in the right screen segment (you can select different NAV pages with both knobs to see more info at once), or Airport, Intersections, NDBs, VOR and Nearest pages group in the full screen or to display the Distance/Time pages while Flight Plan Page is selected by left knob. It also manages the cursor for these pages groups and the Procedures pages.

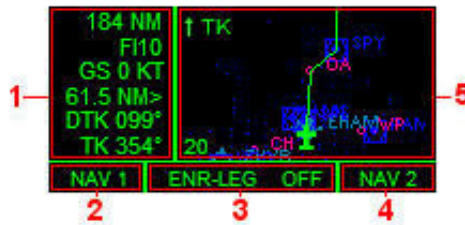
The KLN90B screen has different displays.



Segment 1 shows what you select with the left knob (NAV or OTHER groups). Segment 5 shows what you select with the right knob (NAV group). If you select NAV 1 in both knobs you'll go into super NAV1 page (see below).

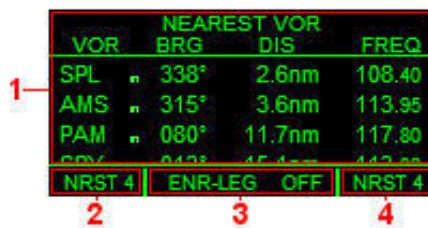
Segment 2 and 4 show the page selected by left or right knob, turns to highlighted CRSR if cursor is active. Segment 3 shows in its left part the LEG (ENR, TERM or APR) and in the right part the message prompt, when the KLN 90B has a message for you to view on the message page, if it hasn't been inhibited by the MSG key.

Pages NAV 5 and 6 have special formats and can be accessed only by left knob.



The information showed in segment one can be changed, as explained later ahead.

Airport, Intersections, NDBs, VOR and Nearest pages groups are full screen modes accessed by right knob.



2.1 Clicking areas



- 1 and 17.** Turn on/off cursor
- 2 and 6.** Change page group shown in left side. Move cursor
- 13 and 16.** Change page group shown in right side. Move cursor
- 3 and 5.** Change page inside a group shown in left side
- 14 and 15.** Change page inside a group shown in right side
- 4.** Shows/Hide flight plan list
- 7.** Shows/Hide message page. If it's pressed a few seconds turns off message ads.
- 8.** Shows/Hide ALT page
- 9.** Shows/Hide Direct To page
- 10.** Clear screen and shows super NAV1 page. Keep it pushed till it happens.
- 11.** Confirm options or enter data.
- 18.** On / Off

2.2 The NAV pages

When you first turn on the KLN90 a self-test page is displayed, followed by another display screen with data concerning your current position. Push ENT key to accept and you'll go into super NAV1 page, that's to say, knob left and right has selected the same NAV page. With the left knob you can select six NAV pages, with the right one you can select 4 NAV pages. Pages 1 to 4 are can be shared by left and right screen segments, 5 and 6 can not. You can choose what to se in each top segment of the screen. See the pictures below as an example:



Super NAV1



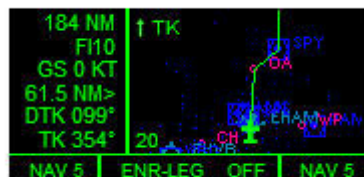
NAV1 – NAV3



NAV1 – NAV4



NAV1 – NAV2



NAV5



NAV6

Super NAV1: The top segment of this screen displays a CDI, the ground speed and data concerning the flight plan next waypoint: distance, bearing to, and time to arrival to that WPT.

NAV2: Displays info about your current position. The radial and distance from a nearby VOR and latitude and longitude.

NAV3: Displays the active flight plan leg, desired track, track and track deviation. MSA and ESA are not implemented.

NAV4: Displays baro pressure, current altitude and altitude selected in autopilot.

NAV5 and 6: Segment 2 displays map, with different orientation: track or north, flight plan route and nav aids. Segment 1 shows in Line 1 distance to next waypoint, in Line 2 next wpt name, in Line 3 ground speed in Line 4 track deviation or ETE, in Line 5 DTK or bearing to next wpt and in Line 6 current track or bearing to next wpt.

To change what to see in Lines 4, 5 and 6 push left CRSR (1), then outer left knob (2) to select the line and inner left knob (3) to select what to display, while you're in NAV5 or NAV6 modes. Then push CRSR again.



While you're in these pages you can zoom in or out the map too. To do this push left CRSR (1), then outer left knob (2) until the zoom figure is highlighted (4) and inner left knob (3) to adjust zoom. Then push CRSR again.



You can select, while in NAV5 or NAV6, what nav aids you want to be displayed in the map. To do this push right CRSR (1), then outer right knob (2) to select the type of nav aid and inner right knob (3) to select nav aid ON (displayed) or OFF (hidden). Then push CRSR again.



2.3 The OTHER pages

This pages group has three pages and shows additional information. Use the outer and inner left knob to browse them.

AIR DATA		ALTITUDE	
TAS	121 KT	BARO:	
MACH	0.19		29.92 inHG
TWIND	5 KT	CURRENT:	
WIND	226°		3206 ft
	13 KT	SEL:	5000 ft
OTHER 1		ENR-LEG	OFF
		NAV 4	

AIR DATA		ALTITUDE	
SAT	8°C	BARO:	
TAT	10°C		29.92 inHG
PRS	3206 FT	CURRENT:	
DEN	3437 FT		3206 ft
		SEL:	5000 ft
OTHER 2		ENR-LEG	OFF
		NAV 4	

FUEL DATA		ALTITUDE	
ENDUR	7 : 11	BARO:	
RANGE	921 NM		29.92 inHG
NM / GAL	3.7	CURRENT:	
RES:	249 GL		3206 ft
		SEL:	5000 ft
OTHER 3		ENR-LEG	OFF
		NAV 4	

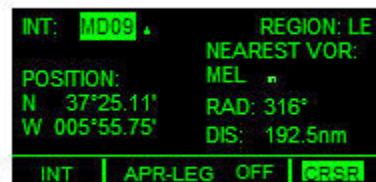
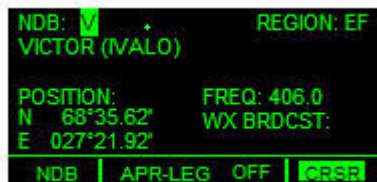
OTHER1: Displays True Air Speed, MACH speed, tailwind speed (TWIND) or headwind speed (HWIND), wind direction and speed.

OTHER2: Displays static air temperature, total air temperature, pressure altitude and density altitude

OTHER3: Displays fuel data: endurance, range, nm per gallon for current condition and fuel left.

2.4 The Airport, Intersection, NDB and VOR pages

These seven pages display info about their respective facilities. You can use the right outer and inner knob and CRSR to manage through them. Here are only a few screenshots.



From these pages, anytime you highlight a frequency (using right CRSR and knob), it can be sent to the NAV COM radio or ADF clicking on ENT button.



2.5 The Nearest pages

These five pages display info about their respective nearest facilities. You can use the right outer and inner knob and CRSR to manage through them. Here are some screenshots.

NEAREST AIRPORT			
APT	BRG	DIS	APR
EHAM	332°	1.1nm	ILS
twr 118.100 rwy 11429ft			
EHV	117°	14.8nm	
mul 131.025 rwy 2293ft			
NRST 1	ENR-LEG	OFF	NRST 1

NEAREST VOR			
VOR	BRG	DIS	FREQ
SPL	338°	2.6nm	108.40
AMS	315°	3.6nm	113.95
PAM	080°	11.7nm	117.80
CDV	042°	15.4nm	112.90
NRST 4	ENR-LEG	OFF	NRST 4

2.6 The Direct To page

Push Direct To button to show this page. In segment 1 you can see and select the Facility to Direct To and its data in the segment 2. Use left knob or keyboard to manage this page and confirm with the ENT key.

DIRECT TO:	KORD
KORD	Chicago-O'Hare Intl
Chicago-O'Hare	Chicago, Illinois
	CRS 308°
FPL:	N 41°58.78'
NRST: LEZL	W 087°54.25'
CRSR	ENR-LEG ENT DTO

2.7 The Flight Plan page

Click in the left knob center to get the Flight Plan List page in the left segment and the Distance/Time page 1 in the right segment of the screen. Left CRSR and outer left knob allow you scrolling through the waypoints of the flight plan. Using the right inner knob you can see up to four D/T in the right segment.

WAYPOINT	DIS	ETE
1.SVL		00
2.CDB	7	46
3.BLN	61	1:02
4.YES	61	1:03
5.VLC	110	1:54
CRSR	ENR-LEG	OFF D/T 1

WAYPOINT	DIS	LCL
0.LEZL		
1.SVL		19:38
2.CDB	45	20:18
3.BLN	105	21:11
4.YES	167	22:05
FLP 0	ENR-LEG	OFF D/T 2

WAYPOINT	DIS	DTK
0.LEZL		
1.SVL		090°
2.CDB	45	065°
3.BLN	61	077°
4.YES	61	082°
FLP 0	ENR-LEG	OFF D/T 3

WAYPOINT	CDB	LCL
0.LEZL	DEP	19:38
1.SVL	TIME	19:38
2.CDB	ETA	20:18
3.BLN	FLT	00:00
4.YES	ETE	00:39
FLP 0	ENR-LEG	OFF D/T 4

- D/T 1 shows distance legs and ETE for them.
- D/T 2 shows cumulated distances and LOCAL ETA for them.
- D/T 3 shows distance legs and DTK to waypoints
- D/T 4 shows active WPT, departure time (GS > 30KNOTS), current Local Time, estimated local ETA to active WPT, flight time (GS > 30KNOTS) and remaining time for active leg (ETE).

Clicking in the left knob center again get out from this page to super NAV1 page, whatever was the page you were in before. While you're in the Flight Plan Pages you can select a Waypoint to fly Direct To it and then follow the flight plan from it. To do this Press left CRSR button, scroll to the desired Waypoint:

WAYPOINT	DIS	ETE
1.SVL		:00
2.CDB	7	:46
3.BLN	61	1:02
4.YES	61	1:03
5.VLC	110	1:54
CRSR ENR-LEG OFF D/T 1		

Press Direct To button. A new screen with the selected WPT appears:

DIRECT TO:	YES
	Vor
YES	CRS 074°
	N 38°21.65'
	W 002°21.17'
CRSR ENR-LEG ENT D/T	

Press ENT button to confirm:

WAYPOINT	DIS	ETE
1.SVL		:00
2.CDB		:00
3.BLN		:00
4.YES	105	2:22
5.VLC	110	1:35
FLP 0 ENR-LEG OFF D/T 1		

The new WPT is selected, bypassing CDB and BLN in the example showed above.

2.8 The Message page

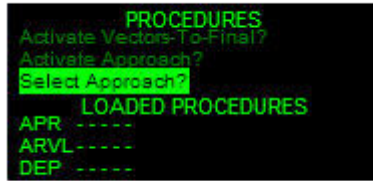
Push MSG button to show/hide message page. It displays Airspaces Alert messages if any. A blinking MSG alert will show in segment 3 if there is a message. This blinking alert can be inhibited keeping MSG button pushed until the MSG letters in segment 3 change to OFF. To recover the alert mode keep pushed MSG again until MSG letters appear.

FUEL DATA	EGLC → LON
ENDUR —	•••••▲ 809m>
RANGE — NM	DIS 875 NM
NM / GAL —	GS 0 KT
RES: 52 GL	ETE 00:00
	BRG 019°
OTHER 3 ENR-LEG MSG NAV 1	

AIRSPACE ALERT	
Inside Airspace	
Press MSG to continue	
CRSR ENR-LEG	

2.9 The Procedures page

You can access the Procedures page while in Flight Plan page. Push Right CRSR and use the Right Knob to select the Approach Procedure desired if available for destination airport.



2.10 The ALT page

To can access the ALT page push ALT button.



You can modify the baro pressure in the left side using the outer left knob. VNAV is not implemented yet the so the right side just shows current altitude and altitude selected in autopilot.

3. BENDIX Radio Stack – INTRODUCTION

Aside from the **ON/OFF Switch**, this radio stack functions much like the default FS2004 and FSX one. The radio stack consists of an audio panel, two NAV/COMs, Transponder, ADF and DME. Below is an image of the click-spots for operating this radio stack.



4. KFC225 AUTOPILOT – INTRODUCTION

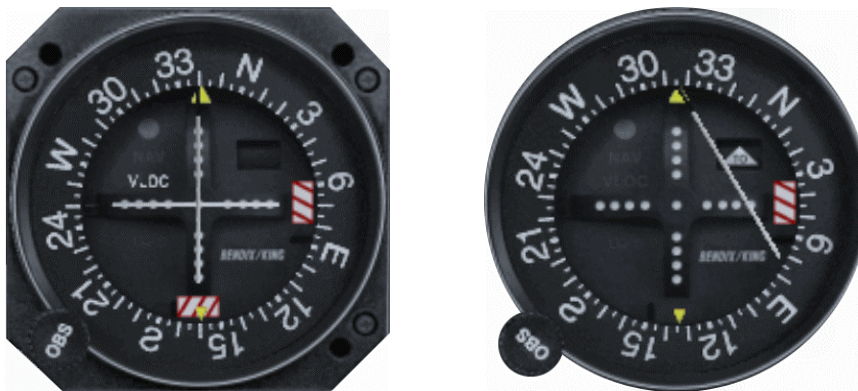


The KFC225 Autopilot is a powerful yet simple to use unit. Only a basic understanding of autopilot functions are needed to use this unit.

The unit has 8 main function keys that allow you to access all the autopilot modes. Simply adjust the altitude by use of the altitude select knob on the right, then press the button for the mode you desire (heading, nav, approach, reverse approach or altitude) and the autopilot will become active. Click the AP (autopilot master) button to disable AP and return the unit to a standby state. When in flight and altitude mode is enabled, use the UP and DN buttons to adjust the VS (vertical speed) or rate of climb or descent.

If the aircraft is equipped with a flight director and/or yaw damper these features can also be accessed through the autopilot by pressing the FD or buttons. When the unit is in standby the AP led flashes and once it is activated the AP led will remain constant. When in altitude mode the ARM led will display to the left of the ALT led. The ARM and VS modes are not modelled in this unit and the buttons are not clickable.

5. VOR HEADS – INTRODUCTION



This package includes a set of Bendix VOR Heads in 2 configurations – with and without bezel – for you to install in your FS aircraft's 2D or VC panel. No special operating instructions are required for these replacement VOR heads, as they operate just like any other VOR head.

6. KMD550 – INTRODUCTION

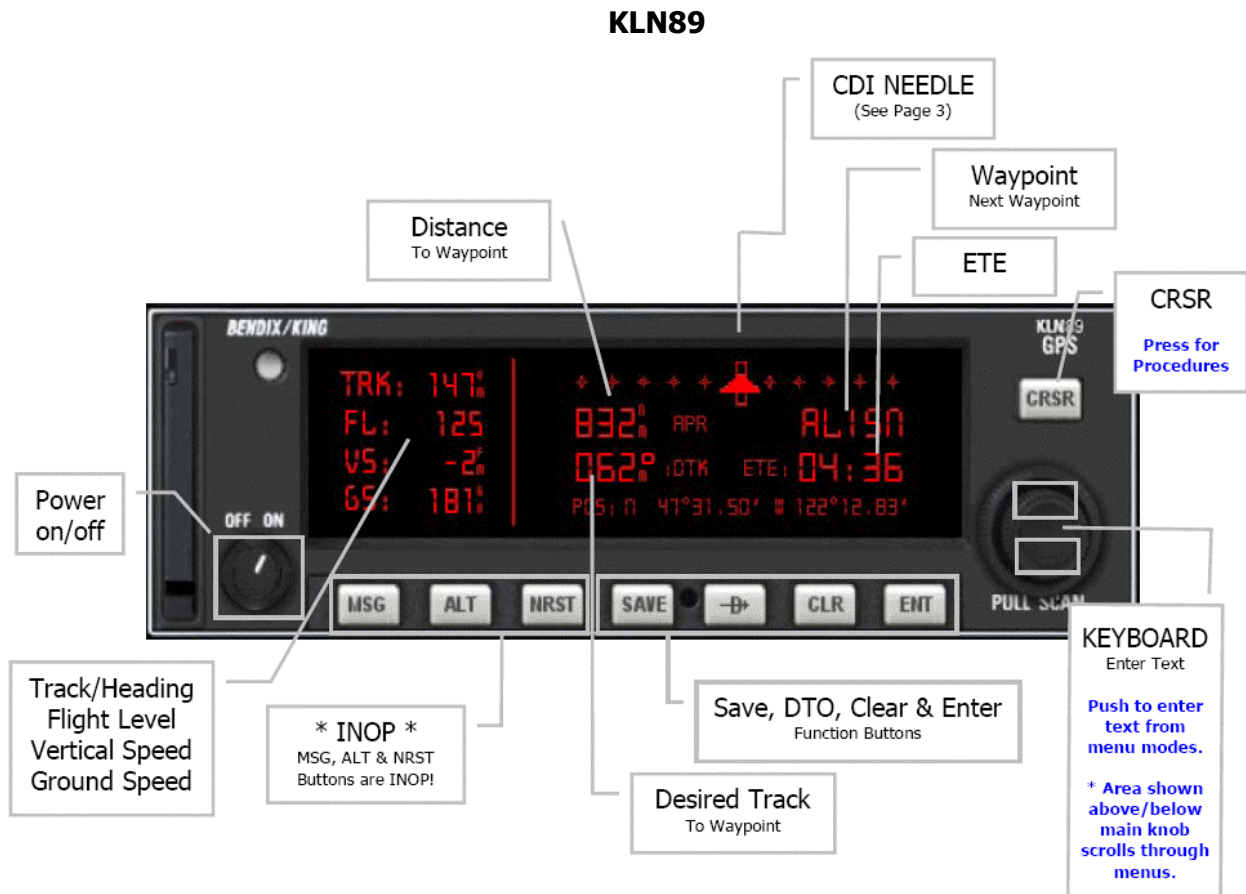


*** Note:** The KMD550 is not a standalone GPS but an MFD (multi-function display) and needs to be paired with one of the GPS units to function correctly.

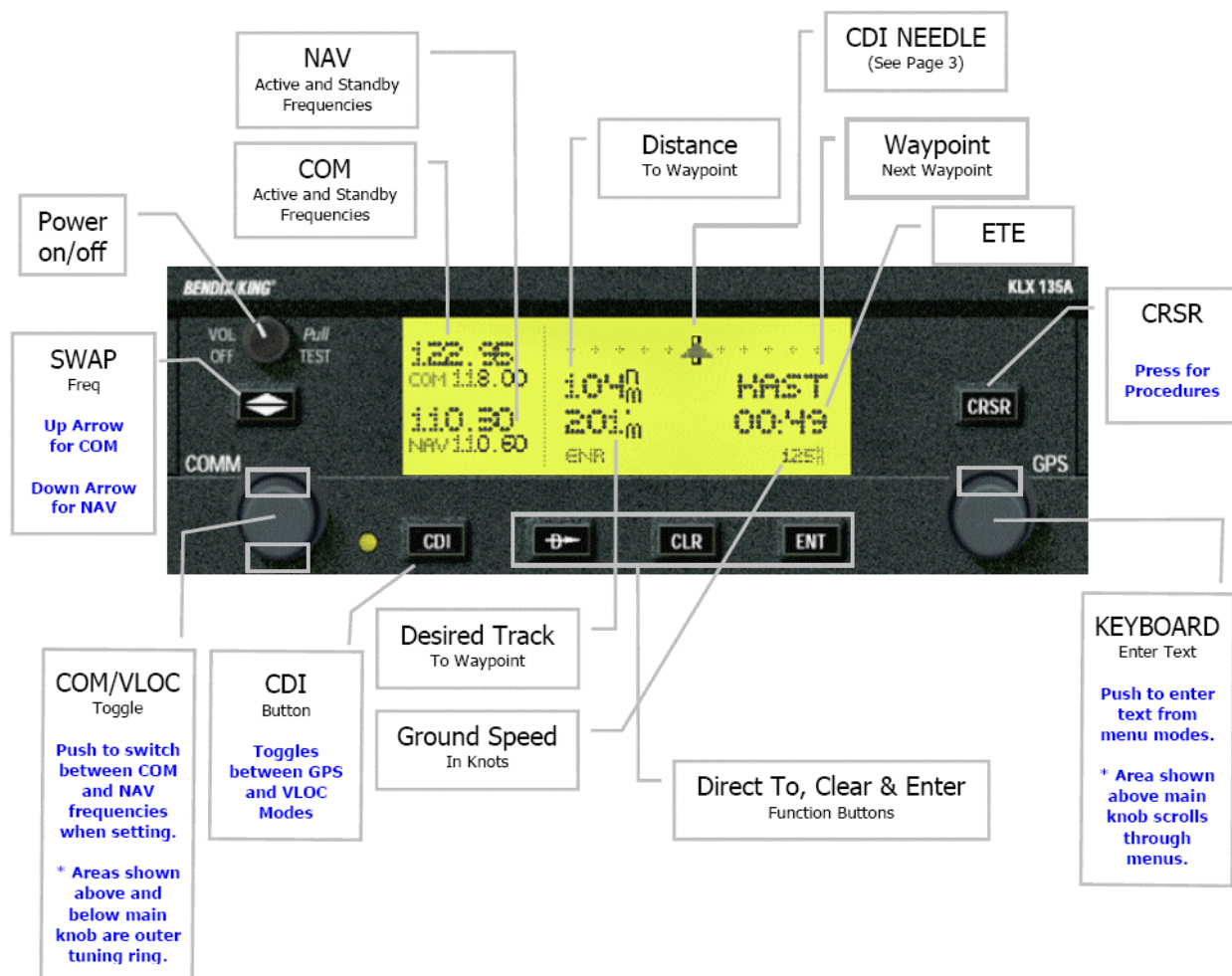
7. ADDITIONAL GAUGES INCLUDED

We have included a few additional gauges such as hole covers and spacers. This additional extra bonus should make it easier for you to fill the holes and gaps that sometimes cause you to "stretch" out the gauges because of a lack of (or too much) space in the panel or VC. Stretching or shrinking gauges cause distortion and poor image quality. We added this little extra to help you out in your panel modifications. (See Installation Instructions below for more gauge info.)

Also, the KLX135 and the KLN89 have been included in this package as well. These are fairly basic units so only a short explanation of their functions are included:



KLX135A



8. INSTALLATION INSTRUCTIONS

Installing The SimFlyer GPX-SX Into Your FS2004 or FSX Aircraft

Things to Know Before You Start:

1. In this manual you will be given the proper codes to place your new gauges into your FS Aircraft, however this manual is not a tutorial on panel design. Some knowledge of FS panel modifications and working within the **panel.cfg** file is required. We will make every attempt to keep the instructions as simple as possible by using basic and user-friendly terms. If you require a full tutorial on panel design, search the AVSIM Forums at www.avsim.com for related topics. Also, a software program called **FS Panel Studio** allows you to modify your panel visually. A free demo is available at the developer's website: www.fspanelstudio.com
2. Remember that a gauge must maintain its "aspect ratio" for it to retain a smooth, clean and crisp look. When changing gauge sizes, always try to maintain this aspect ratio or the gauge can become distorted.
3. Not all VCs can accommodate all gauges. Some aircraft developers place 3 dimensional objects (such as knobs) in the VC where you might want to place a gauge. If you place the gauge there you may not be able to see the gauge correctly because the 3D objects may cover it. Sorry, but this is beyond our control.
4. Panel and VC Lighting. This is important because some aircraft modelers provide a lighting bitmap in the texture folder of the aircraft. Users who have some image modification skills can normally fix this.
5. Making Radios and Autopilots Work Correctly. There are a few areas in the **aircraft.cfg** file that need to be addressed when using these units. Make sure that the following lines in the **aircraft.cfg** file are set correctly or your radios may not tune and/or your autopilot may not function correctly. Open the **aircraft.cfg** file using windows notepad and search for the following sections, then make any changes:

//-----

[Radios]

Com.1=1, 1

Com.2=1, 1

Nav.1=1, 1, 1

Nav.2=1, 1, 0

Audio.1=1

Adf.1=1

Transponder.1=1

Marker.1=1

//-----

[autopilot]

autopilot_available=1

(do not modify any lines below this point)

Installing The SimFlyer GPX-SX Into Your FS2004 or FSX Aircraft - (Continued)

A Quick Tutorial: Let's take a moment to explore the layout of the gauge code. Below, we will work with a fictitious gauge as an example to show you just what all this code really means:

1. Gauge Number - This is the number of the gauge as it is listed in the panel.cfg file. No two gauges in any [window] can have the same gauge number assigned, so be sure to modify this correctly to reflect that.

//----- Example Code -----

Gauge #	/	Gauge Name	/	Distance from left	/	Distance from top	/	Gauge Width	/	Gauge Height
Gauge00	=	SFGPX SX!DEMO,		000,		000,		000,		000

//-----

2. Gauge Name - This is a unique name given to each gauge. No two gauges in any [window] can have the same name assigned, so be sure to modify this correctly to reflect that.

//----- Example Code -----

Gauge #	/	Gauge Name	/	Distance from left	/	Distance from top	/	Gauge Width	/	Gauge Height
Gauge00	=	SFGPX SX!DEMO,		000,		000,		000,		000

//-----

3. Gauge Position - From left to right, numbers reflect the gauge distance from left of panels edge, distance from the top of panels edge, gauge size in width and gauge size in height.

//----- Example Code -----

Gauge #	/	Gauge Name	/	Distance from left	/	Distance from top	/	Gauge Width	/	Gauge Height
Gauge00	=	SFGPX SX!DEMO,		000,		000,		000,		000

//-----

This is an *example* of the demo gauge above written in the proper gauge code format:
 Gauge17=SFGPX SX!DEMO, 120,63,350,98

Installing The SimFlyer GPX-SX Into Your FS2004 or FSX Aircraft - (Continued)

Installing The Gauges: Below is a listing of the codes you will need to add to the **panel.cfg** file to allow your gauges to display in the 2D and VC Panels. Keep in mind that every panel is different and that you will have to adjust the sizes and positions for each gauge in order for the gauges to appear where you want them.

Single Gauge Codes: (For placement in 2D panels, VCs and pop-up windows.)

KMA28 (Audio Panel) //----- gauge00=SFGPX SX!KMA28, 0,0,0,0 //-----	KLN94 (GPS) //----- gauge00=SFGPX SX!KLN94, 0,0,0,0 //-----
KX155 (Nav/Com 1) //----- gauge00=SFGPX SX!KX155_1, 0,0,0,0 //-----	KLN90B (GPS) //----- gauge00=SFGPX SX!KLN90B, 0,0,0,0 //-----
KX155 (Nav/Com 2) //----- gauge00=SFGPX SX!KX155_2, 0,0,0,0 //-----	KMD550 (MFD) //----- gauge00=SFGPX SX!KMD550, 0,0,0,0 //-----
KT70 (Transponder) //----- gauge00=SFGPX SX!KT70, 0,0,0,0 //-----	VOR Head 1 - Round //----- gauge00= SFGPX SX!bvor_1, 0,0,0,0 //-----
KR87 (ADF) //----- gauge00=SFGPX SX!KR87, 0,0,0,0 //-----	VOR Head 1 - With Bezel //----- gauge00= SFGPX SX!bvor_1b, 0,0,0,0 //-----
KN62 (DME) //----- gauge00=SFGPX SX!KN62, 0,0,0,0 //-----	VOR Head 2 - Round //----- gauge00= SFGPX SX!bvor_2, 0,0,0,0 //-----
KFC225 (Autopilot) //----- gauge00=SFGPX SX!KFC225, 0,0,0,0 //-----	VOR Head 2 - With Bezel //----- gauge00= SFGPX SX!bvor_2b, 0,0,0,0 //-----

Installing The SimFlyer GPX-SX Into Your FS2004 or FSX Aircraft - (Continued)

Single Gauge Codes: (For placement in 2D panels, VCs and pop-up windows.)

Cover Plate (Rectangle Cover Plate)	Gauge Cover 1 (Round Generic Gauge Cover)
//----- gauge00= SFGPX SX!CoverPlate, 0,0,0,0 //-----	//----- gauge00= SFGPX SX!GaugeCover, 0,0,0,0 //-----

Example Code for Bendix Full Radio Stack and KLN94 Pop-Up Windows

[Window Titles]

Window02=Radio Stack

Window03=GPS

//-----

[Window02]

Background_color=2,2,2

size_mm=500,748

window_size_ratio=1.000

position=2

visible=0

ident=RADIO_STACK_PANEL

gauge00=SFGPX SX!kma28, 0,0,500,97

gauge01=SFGPX SX!kx155_1, 0,97,500,157

gauge02=SFGPX SX!kx155_2, 0,254,500,157

gauge03=SFGPX SX!kt70, 0,411,500,129

gauge04=SFGPX SX!kr87, 0,540,500,105

gauge05=SFGPX SX!kn62, 0,645,500,103

gauge06=SFGPX SX!toggle_radios, 65,423,291,55

gauge07=SFGPX SX!toggle_radios, 13,549,325,47

gauge08=SFGPX SX!toggle_radios, 8,654,234,44

//-----

[Window03]

Background_color=2,2,2

size_mm=500,284

window_size_ratio=1.000

position=0

visible=0

ident=GPS_PANEL

gauge00=SFGPX SX!kln94, 0,0,500,156

gauge01=SFGPX SX!kfc225, 0,156,500,128

gauge02=SFGPX SX!toggle_gps, 62,170,293,56

//-----

Installing The SimFlyer GPX-SX Into Your FS2004 or FSX Aircraft - (Continued)

Designer Tip: The easiest way to code a popup window (and best way to maintain a true gauge aspect ratio) is to use the "true" gauge sizes in the code, then (if needed) reduce the size of the popup window by changing the "window_size_ratio" line: Change -> **window_size_ratio**=1.000 | To -> **window_size_ratio**=0.800

* Notice that we renamed "**window_size**" to one word, **window_size**? This will change the window size while maintaining true gauge aspect ratio. You can also continue to reduce the percentage (=0.800, =0.600 etc.) as needed until the desired window size is achieved.

About Idents in Pop-up Windows

In the **panel.cfg** file, the use of the "ident=" line tells each pop-up window which panel icon or hidden "click-spot" is calling that window to open. You CAN NOT have two windows with the same ident or the panel will not function correctly. The KX155 and KLN90b/KLN94 units have imbedded click-spots. Clicking the face of the unit will cause it to "pop-up" and/or close. Here is a list of idents for each of the units WITH click-spots:

Standard Panel Configuration, where there is only 1 GPS and a full Radio Stack.

/ Gauge Description /	Gauge Name /	Ident=? /
KLN94 (GPS Unit)	SFGPX!KLN94	ident= GPS_PANEL
KLN90B (GPS Unit)	SFGPX!KLN90	ident= GPS_PANEL
KX155 (Nav/Com 1)	SFGPX!KX155_1	ident= RADIO_STACK_PANEL
KX155 (Nav/Com 2)	SFGPX!KX155_2	ident= RADIO_STACK_PANEL

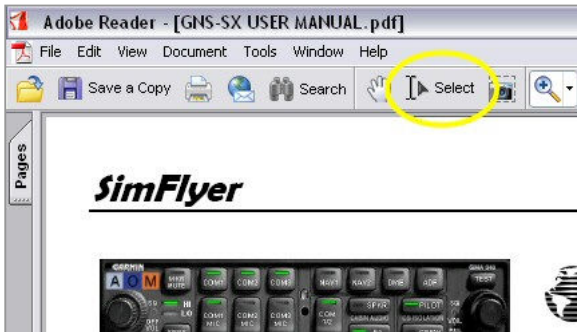
Invisible toggles are also included in case you want to place toggle areas over existing panel areas. We used these in the full radio stack example shown above on page 27. The gauge names of the toggles as well as the KLN89 and KLX135 are listed below:

/ Gauge Description /	Gauge Name /	Ident=?
GPS TOGGLE	SFGPX!toggle_gps	ident= GPS_PANEL
RADIO STACK TOGGLE	SFGPX!toggle_radios	ident= RADIO_STACK_PANEL
KLN89	SFGPX89!KLN89	ident= not available on this unit
KLX135A	SFGPX135!GPS	ident= not available on this unit

- Now, In Wrapping Things Up -

In closing, SimFlyer would like to thank you for your purchase of the Series-X GPX-SX. We hope you enjoy many hours of sim-flying fun with it.

Making Things Easier On Your-Self.



Just a final tip before closing. It is always much easier to "copy and paste" code than to try to simply type it into your panel.cfg file. Typos can cause many hours of frustration on your part as well as ours. Be sure to **copy and paste** all the code we supplied here and things will move much smoother for you.

Adobe Reader will allow you to **copy** text directly from the reader. Simply click on **Select** button (circled above in yellow) on the Adobe Reader Toolbar, then you can copy and **paste**

the text directly to the panel.cfg you are working on.

*** Recommendations:** We always recommend that you use notepad to make all your freehand modifications. If you are new to panel modification, we strongly recommend a software program called **FS Panel Studio**. It is available at www.fspanelstudio.com and the developer even offers a free demo! This software allows you to modify your panel in a visual way... you can see the changes you make in real-time!



*** For Technical Support Please Visit Our Website at: www.simflyer.net ***