

MASTERING the 430/530



VFR/IFR

Maart 2008
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What to cover

- Functions
- Initialization
- Structure
- Flight Planning
- IFR procedures
- Summary
- Q&A



Much more than a Belgian TomTom



Garmin 430/530

“THE NAVIGATOR”

- Acts as a communications and navigation management system
- Integrates radio transceiver, navigation receiver (VOR/Localizer/GS), and GPS navigation capability into a single unit
- Incorporates many additional supporting functions (like VNAV, Scheduling, Terrain, Traffic alert, timer, computations like TAS etc)

Functions

- C(ommunications) Knob
 - Power / Com Volume
 - Squelch
- V(OR/Localizer) Knob
 - VLOC Volume
 - Ident
- C Flip
 - Moves standby Com frequency to active
- V Flip
 - Moves standby VLOC frequency to active



Functions

- Push C/V
 - Selects between Comm and VLOC frequency selection
- Large Knob (1 MHz)
- Small Knob (25 of 8,33 KHz)
- Data card 1
 - Contains Jeppesen NavData (28 days cycle)
- Data card 2
 - Unused



Functions



- CDI
 - Selects between GPS and VLOC navigation data output to ext. CDI/HSI/PFD
- OBS
 - Selection *inhibits* auto sequencing of waypoints in a FPL and turns GPS in VOR-like device. Or *continue* auto sequencing if GPS initiated suspend
- MSG
 - Displays Message Page
- FPL
 - Displays Flight Plan Chapter
- PROC
 - Displays Instrument Procedures from GPS database

Functions

- RNG
 - Adjusts moving map scale
- D→
 - Direct To function
- MENU
 - Displays menu for current activity
- CLR
 - Clears data field
 - Hold for 2 seconds to switch to default Nav page



Functions

- ENT
 - Activates function, enters data
- PUSH CRSR
 - Activates cursor for active function
- Large Knob
 - Sequences between data fields
- Small Knob
 - Selects character in current data field



Initialization

- Power Up
- GPS mode
- No active FPL
- SW versions
- COM Freq's memory
- NAV Freq's memory



Initialization

- Database Cycle
- Database Expiration Date



Initialization

- Instrument Panel Self-Test
- Check CDI/HSI/other indicating equipment



Structure

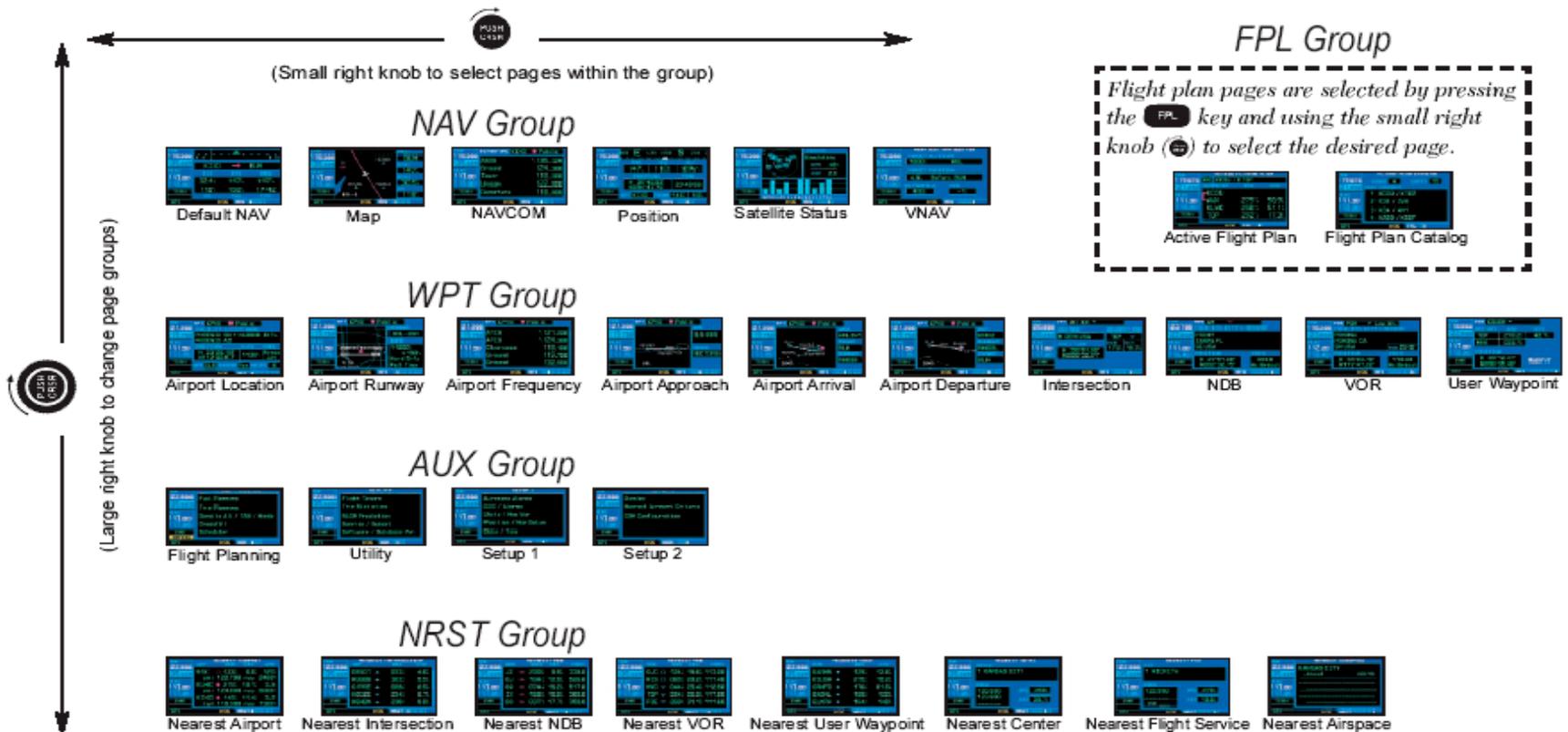
- Chapters
 - Current chapter identified by white letters at bottom of screen
- Pages
 - Current page number indicated by position of white block at bottom of screen



Chapter

Page Number

Chapter and Page Selection



Selection of any main page is performed using the large (⊖) and small (⊖) right knobs. The large right knob (⊖) selects the page group: NAV, WPT, AUX or NRST. The small right knob (⊖) selects the desired page within a group. To quickly select the default NAV page, press and hold **CLR**.

Structure (Nav Chapter 1)

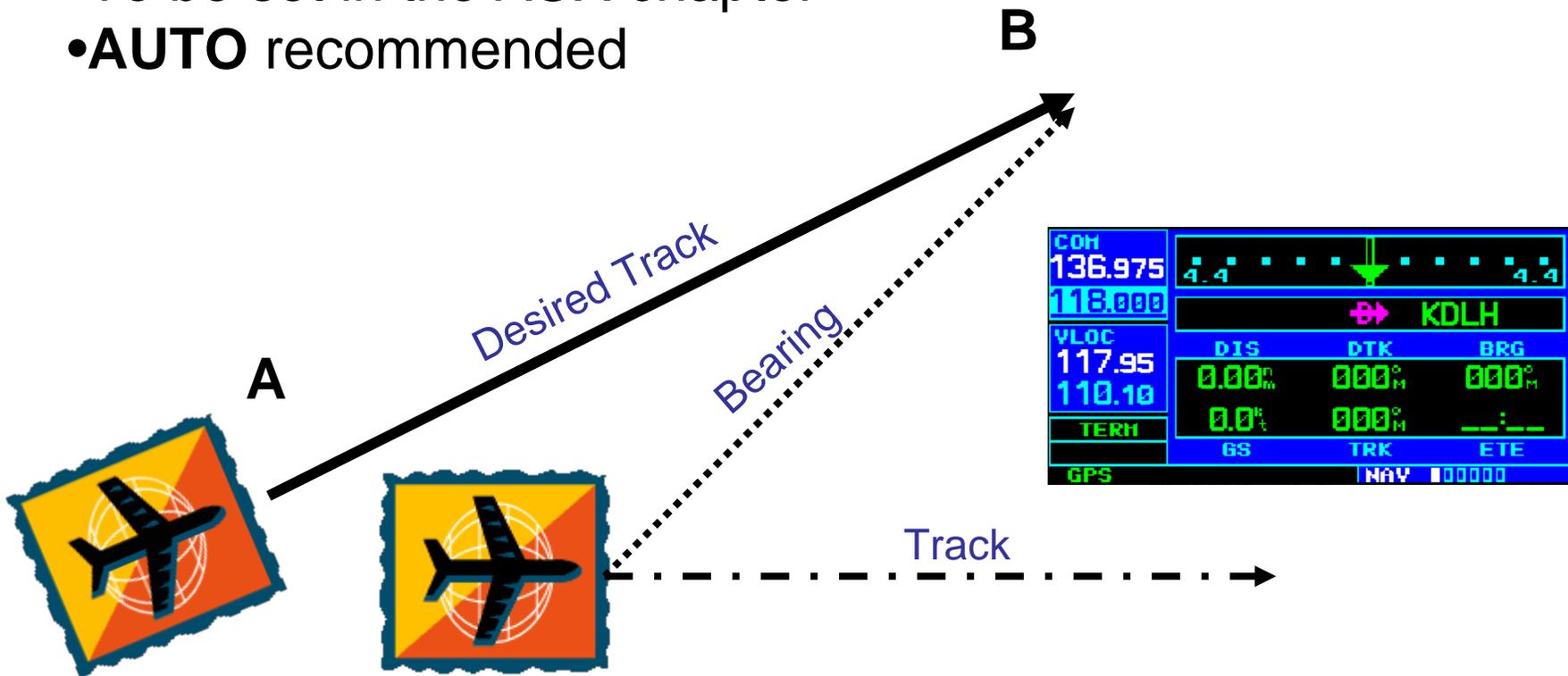
- Nav 1
 - Electronic CDI Needle
 - Active Waypoint
 - User definable data
 - Default Nav Page



CDI sensitivity (when set to auto) :
5NM = ENR (enroute 30NM from dep./dest.)
5NM = OCN (oceanic 30NM from dep./dest.)
1NM = TERM (terminal within 30NM dest.)
0,3NM = APP (approach 2NM from FAF)

DTK, BRG, TRK

- Course is Magnetic or True or Manual Var.
- To be set in the AUX chapter
- **AUTO** recommended



COH	136.975	4.4	↓	4.4
VLOC	117.95	KDLH		
TERH	110.10	DIS	DTK	BRG
GPS		0.00°	000°	000°
		0.0%	000°	__:_
		GS	TRK	ETE
		NAV 00000		

Structure (Nav Chapter 2)

- Nav 2
 - Moving Map
 - User definable fields at right
 - Map has three declutter levels, cycled by pressing CLR (let op de -1, -2, -3)



Structure (Nav Chapter 3)

- Nav 3
 - Frequency information page for active flight plan
 - Cycles between departure and arrival airports frequency information automatically



Use the **CURSOR** and **ENT** to move freq's in the **Standby** box **COM**

Structure (Nav Chapter 4)

- Nav 4
 - Position
 - Commonly used during *partial panel operations*
 - Only page with **Altitude** indication
 - If 2x 530/430 available use both for *partial panel operations*.



Change to VOR
for position reporting



Structure (Nav Chapter 5)

- Nav 5
 - Satellite Status
 - Solid bars indicate satellite acquired
 - Height of bar indicates satellite signal strength
 - White number below bar indicates satellite number
 - Indicates GPS accuracy



Structure (Nav Chapter 6)

- Nav 6
 - Vertical Navigation (VNAV)



CAUTION

- Shall not be used for approach vertical guidance
- Uses GPS altitude, no barometric value!
- Recommended for descend or climb planning
- 1 min prior descent a message is displayed
- 500' before target altitude a message is displayed
- VSR constantly re-calculated
- Approach vertical guidance **emergencies only**

Structure (WPT Chapter)

- Waypoints can be:
 - Airports 6 pages (position, runway, freq's, STAR, APPR, SID)
 - Intersections
 - NDB's
 - VOR's
 - USR's user defineable waypoints



Structure (NRST Chapter 1)

- Nrst 1
 - Nearest Airports
 - **Part of EMERGENCY PROCEDURE**
 - PUSH CLR 3 seconds, TURN large knob to the right, PUSH cursor, TURN to airport by large knob, PUSH D->, PUSH ENTER, LOOK, PUSH ENTER



Structure (NRST Chapters)

- Nrst 2
 - Nearest Intersections
- Nrst 3
 - Nearest NDB
- Nrst 4
 - Nearest VOR
- Nrst 5
 - Nearest USR
- Nrst 6
 - Nearest ARTCC



- Nrst 7
 - Nearest FSS
- Nrst 8
 - Nearest Airspace

Structure (AUX Chapters)

- Aux Chapters for
 - Fuel Planning
 - Utility (sunrise sunset RAIM, statistics etc.)
 - Set up (units, date/time, display)
- RAIM
 - Receiver Autonomous Integrity Monitoring
 - Ensures adequate satellite geometry during flight
 - If not **INTEG** will flash left corner box. **Use legacy NAV resources**



+MAP

- Creates a waypoint on the map
- Push cursor for MAP mode
- Move large and small button
- Push D->
- Push ENT
- +MAP stored in memory



Recommended for maneuvering around a specific area or towards a VFR fix

Time for a break



Dad, why are there always 2 pilots ?
One has to prevent the other from doing stupid things.
Which one is doing the stupid things ?

Next:

- Flight planning
- IFR
- Do's & Don'ts
- Q&A

Structure (FPL Access Key)

- Fpl 1
 - Active Flight Plan
 - Lost when pwr switched off
- Fpl 2
 - Flight Plan Catalog
 - Can store 19 user defined flight plans



Structure (FPL Access Key)

- Proc
 - Instrument Procedures



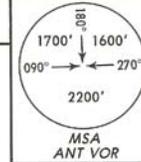
EBAW/ANR
 DEURNE

JEPPESEN
 28 JUL 06 (10-3A) Eff 3 Aug

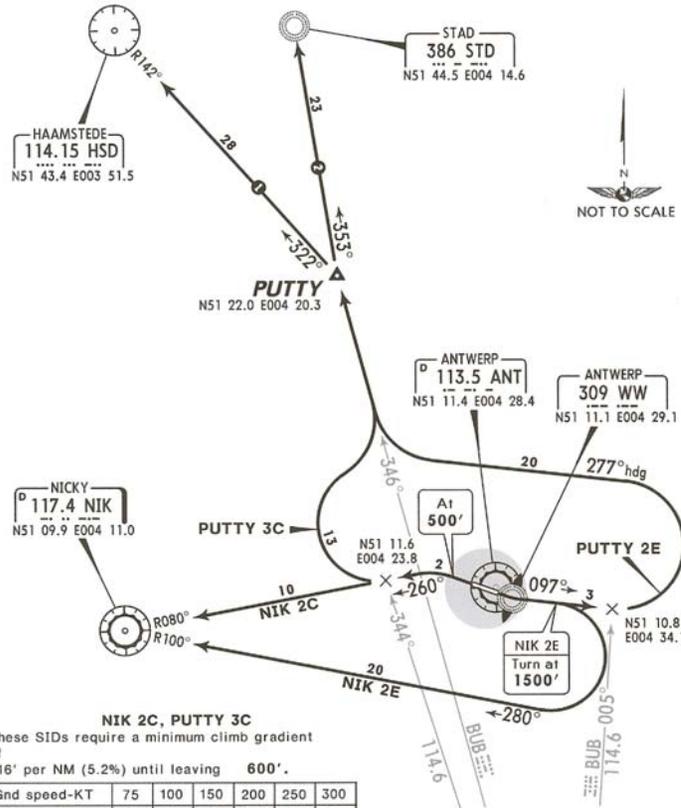
ANTWERP, BELGIUM
SID

Apt Elev
 39'

Trans level: By ATC Trans alt: 4500'



NICKY TWO CHARLIE (NIK 2C)
NICKY TWO ECHO (NIK 2E)
PUTTY THREE CHARLIE (PUTTY 3C) [PUTY3C]
PUTTY TWO ECHO (PUTTY 2E) [PUTY2E]
RWYS 29, 11 DEPARTURES



NIK 2C, PUTTY 3C

These SIDs require a minimum climb gradient of 316' per NM (5.2%) until leaving 600'.

Gnd speed-KT	75	100	150	200	250	300
316' per NM	395	527	790	1053	1317	1580

If unable to comply with SIDs advise ATC when requesting start-up clearance.

SID	RWY	ROUTING
NIK 2C	29	Climb to 500', turn LEFT, intercept NIK R-080 inbound to NIK.
NIK 2E	11	Climb straight ahead to 1500', turn RIGHT, intercept NIK R-100 inbound to NIK.
PUTTY 3C	29	Climb to 500', turn LEFT, intercept NIK R-080 inbound, at BUB R-344 turn RIGHT, intercept BUB R-346 to PUTTY. ① To EHAM: To HSD. ② Other destinations: To STD.
PUTTY 2E	11	Straight ahead to WW, 097° bearing, at BUB R-005 turn LEFT, 277° heading, intercept BUB R-346 to PUTTY. ① To EHAM: To HSD. ② Other destinations: To STD.

Select Departure

- GPS looks for 1st waypoint in FPL
- Offers choice of available SID's
- CHECK and COMPARE loaded procedure and SID chart
- CHECK next waypoint on the rwy just before take-off



Select Arrival

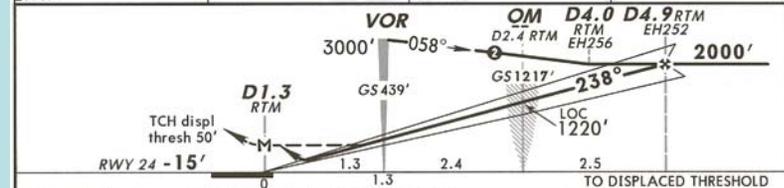
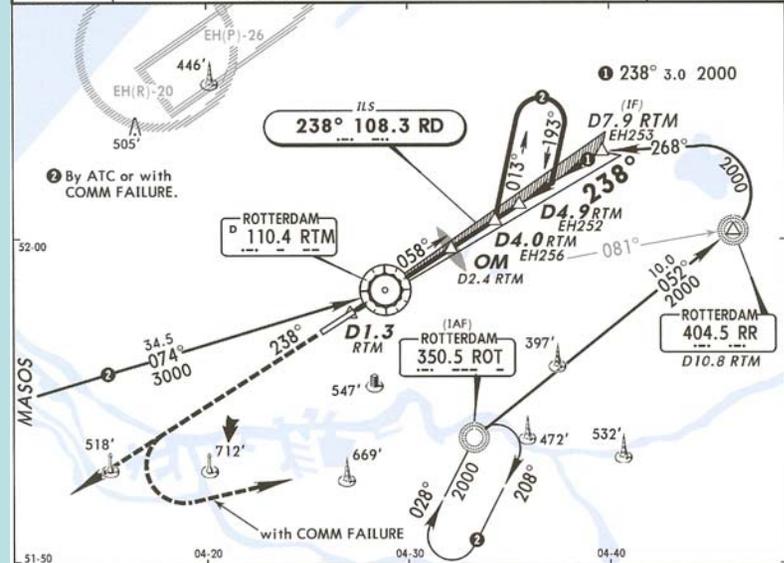
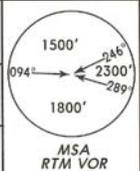
- GPS looks for last waypoint (destination) in FPL
- Offers choice of available STAR's
- CHECK and COMPARE loaded STAR waypoints and STAR chart
- Make sure last waypoint FPL = first waypoint loaded STAR
- No "Activate Arrival"!! so D-> first waypoint loaded STAR in the FPL



EHRD/RTM
ROTTERDAM

JEPPESSEN ROTTERDAM, NETHERLANDS
 16 NOV 07 (1-1) Eff 22 Nov ILS Rwy 24

ATIS 110.4		*ROTTERDAM Approach (R) 127.02 126.67X		ROTTERDAM Tower 118.2 119.7G	
LOC RD 108.3	Final Apch Crs 238°	GS OM 1217' (1232')	ILS DA(H) 185' (200')	Apt Elev -15	RWY -15 (BELOW SEA LEVEL)
MISSED APCH: Climb on track 238° to 2000'. Contact ATC. MISSED APCH WITH COMM FAILURE: Climb on track 238° to 2000', then turn LEFT to ROT NDB and hold or execute apch procedure again.					
Alt Set: hPa Rwy Elev: -1 hPa Trans level: By ATC Trans alt: 3000' 1. CAUTION: Disregard DME readings from VOLKEL TACAN operating on same freq as RD LOC. 2. Expect radar vectors to final.					



Gnd speed-Kts	70	90	100	120	140	160	HIALS 2000' on 238°
ILS GS 3.00° or	377	484	538	646	753	861	
LOC Descent Gradient 5.2%							

JAR-OPS				STRAIGHT-IN LANDING RWY 24		CIRCLE-TO-LAND Prohibited Southeast of runway	
ILS DA(H) 185' (200')		LOC (GS out) MDA(H) 370' (385')					
FULL		ALS out		Max Kts		MDA(H) VIS	
A			RVR 900m	100	440' (455')	1500m	
B	RVR 550m	RVR 1000m	RVR 1000m	135	520' (535')	1600m	
C			RVR 1400m	180	760' (775')	2400m	
D			RVR 2000m	205	760' (775')	3600m	

Select and Activate Approach

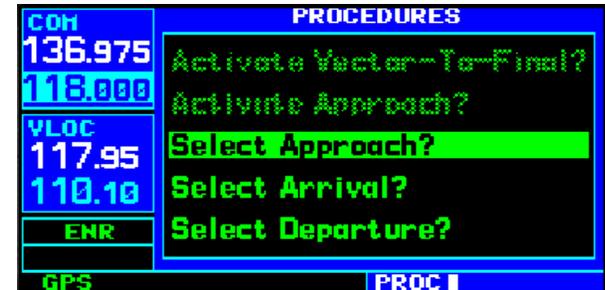
- GPS looks for last waypoint in FPL
- Offers choice of available Approaches
- LOAD the expected approach, **do not activate immediately!!**
- You can easily load a different approach. Again **do not activate immediately!!**
- CHECK and COMPARE loaded approach and approach chart
- ACTIVATE approach *only* when *cleared* for the approach
- Activate approach is *always* **D-> IAF**



Note!
ILS or VOR freq is loaded in standby NAV box when approach is loaded and/or activated (if not active already)

Activate Vector-To-Final

- GPS displays a QDM at a final approach course inbound MAP
- Do not active vector-to-final before final intercept course towards the localizer/radial. You will loose all other reference waypoints when activated



Auto VLOC

- When established on localizer course Navigator will switch automatically from GPS to VLOC (when enabled)
- No Auto VLOC when established on a VOR radial. GPS will warn to select manually VLOC



Going Missed

- At reaching MAP waypoint sequencing is suspended. A vector at runway heading is offered as a reference.
- PUSH OBS knob when stable in the climb, the missed approach procedure is loaded and activated, waypoint sequencing is started.
- Check loaded procedure
- If procedure is “climb rwy heading 2000ft, contact ATC” only a vector at rwy heading will be offered. Waypoint sequencing is suspended again!
- Select and load approach
- Check loaded procedure
- Activate approach when cleared for next approach, remember this will be again D-> to IAF

Fly Leg

- Fly Leg is 45 degrees intercept desired track line to selected waypoint
- Select waypoint in FPL
- Push **2x** D->
- Push enter to activate



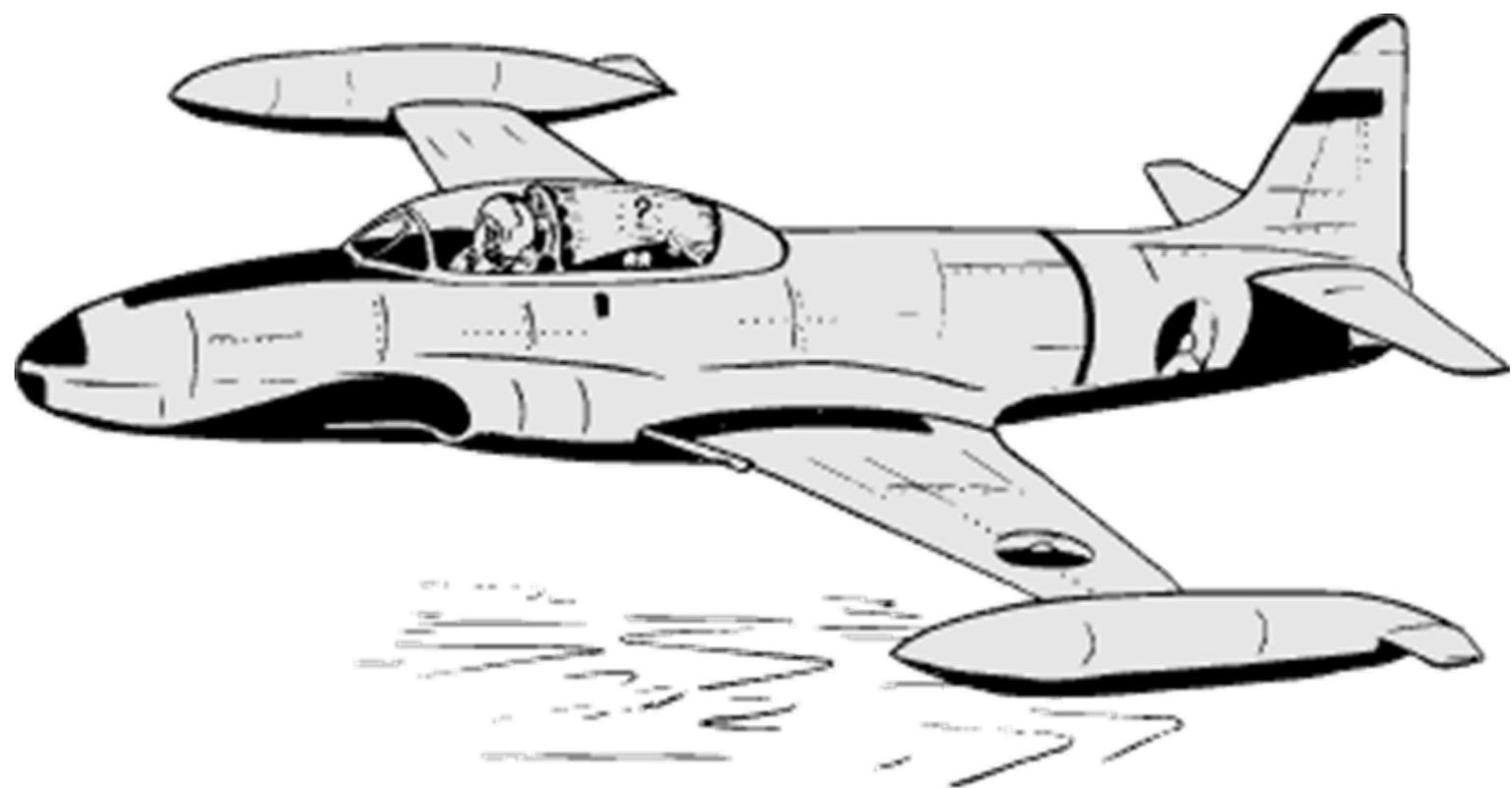
Non published holding

- Push OBS. Waypoint sequencing is suspended.
- Enter inbound course by external OBS knob or by entering digits
- Use GPS for situational awareness and guidance to intercept inbound radial



Recommended to intercept RWY heading in VFR approach when needed

Note: 'published' holdings not always part of a stored procedure



Where are we ??

Random trivia

- Levels of declutter on the MAP page with CLR key
- Use a FPL! Have at least a departure and a destination
- Do not use D-> to a waypoint not part of the flightplan. It will cancel the map display of your plan or worse your approach
- Practice the D-> an VOR or Intersection which is not part of a flightplan.
- Decide up-front to use the GPS for primary guidance and traditional means (VOR/ADF/DME) as secondary or the other way around
- Know how to dimm at night, check the display before in the dark
- RAIM not available mostly cable or antenna issue
- Understand very very well the “Activate Approach” option
- Activate “Vectors to Final” not before final intercept course
- Practice in flight the OBS option. Have a safety pilot with you
- Cross check the loaded procedure with the plate
- Have FUN mastering the Garmin, do not forget to look outside!!



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