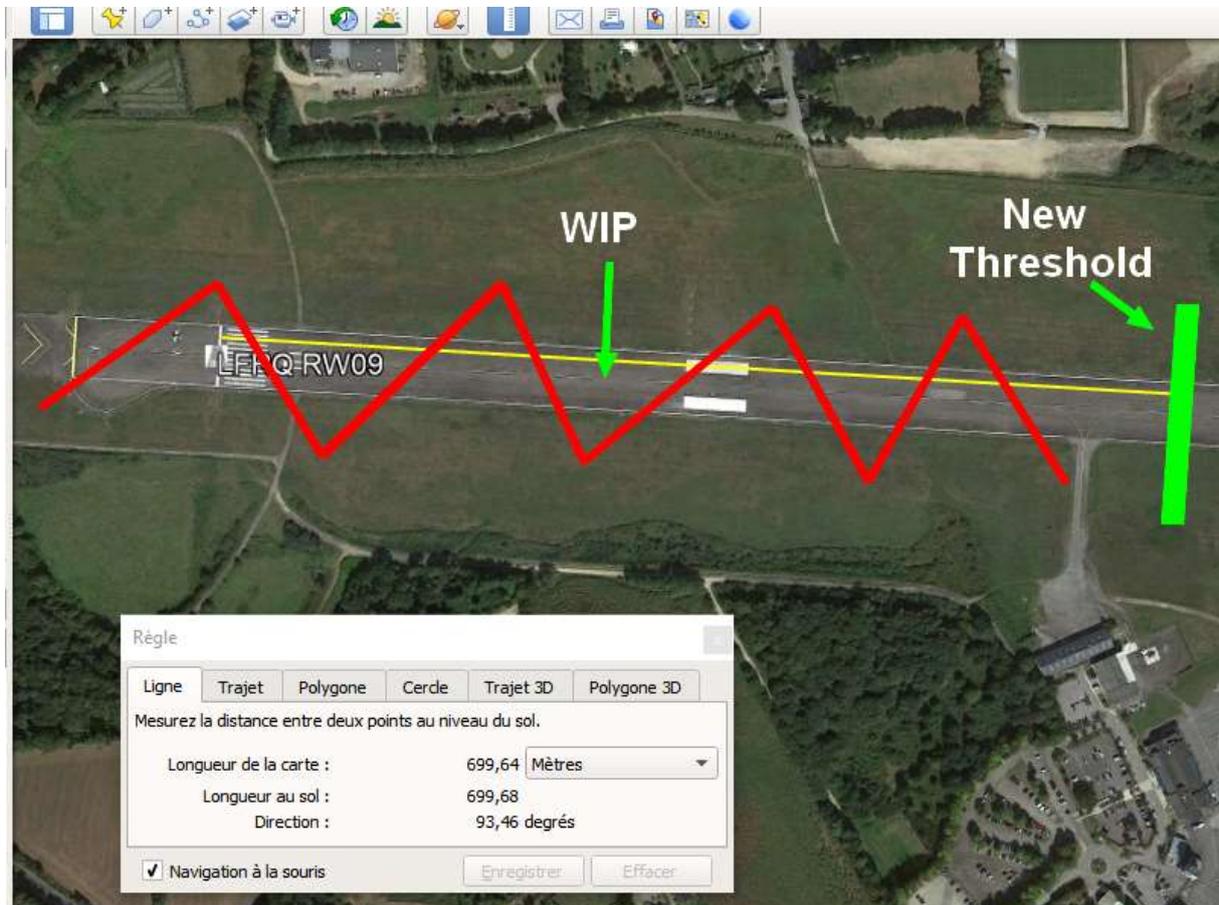


# Coding in FMS a new approach because of Runway under construction.

Imagine we have at LFRQ (Quimper) the runway reduced by 700m because of vehicles and workers in the first part of the runway 09.



We have to modify the existing approach:

Approach - LFRQ - R09

Quimper / Pluguffan

Mag Var : 01.0° W

Via	Seq	Pt	Fix	Typ	F/D	Mag	Crs	Alt 1	Alt 2	Vert Angle	RNP	Speed Limit	Distance Time	Coordinates Fix	Rec Navaid	Cycle : 2111	Update
RQ401	10	IF	RQ401	IAF										N48.03.5 W004.09.8		Transition	2105
RQ401	12	TF	RQ403			274.3°					1		12 Nm	N48.04.2 W004.27.7		Transition	2105
RQ401	20	TF	IRQ09	Inter AF		184.2°	+	3000			1	160 Kt	5 Nm	N47.59.2 W004.28.1		Transition	2105
RQ403	10	IF	RQ403	IAF										N48.04.2 W004.27.7		Transition	2105
RQ403	20	TF	IRQ09	Inter AF		184.2°	+	3000			1	160 Kt	5 Nm	N47.59.2 W004.28.1		Transition	2105
RQ404	10	IF	RQ404	IAF Hold										N48.02.7 W003.48.3		Transition	2105
RQ404	11	TF	RQ401			274.5°					1		14.5 Nm	N48.03.5 W004.09.8		Transition	2105
RQ404	12	TF	RQ403			274.3°					1		12 Nm	N48.04.2 W004.27.7		Transition	2105
RQ404	20	TF	IRQ09	Inter AF		184.2°	+	3000			1	160 Kt	5 Nm	N47.59.2 W004.28.1		Transition	2105
	10	IF	IRQ09	Inter AF			+	3000				160 Kt		N47.59.2 W004.28.1			2105
	20	TF	FRQ09	FAF		94.2°		3000			1		3.2 Nm	N47.59.0 W004.23.4			2105
	30	TF	Rw09	MaPt	FO	94.3°		342		-3.00°	0.3		8.3 Nm	N47.58.5 W004.11.0			2105
	40	TF	RQ411	Go Arr	FO	94.4°					1		8 Nm	N47.58.0 W003.59.2			2105
	50	DF	RQ404		L			3000			1			N48.02.7 W003.48.3			2105
	60	HM	RQ404		R	201°						230 Kt	1 Min	N48.02.7 W003.48.3			2105

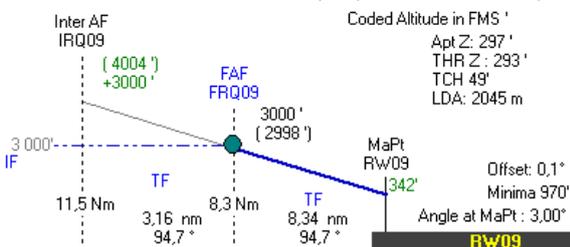
Approach - LFRQ - R09 Cycle : 2111

Threshold

9	8	7	6	5	4	3	2	1
3210	2890	2570	2250	1940	1620	1300	980	660

D-Point: 8.3 Nm from THR ( Intercept at 3000' )  
 ( Computed Altitude from MaPt ' )

Rw09  
 N47.58.5  
 W004.11.0



Arinc Decoder

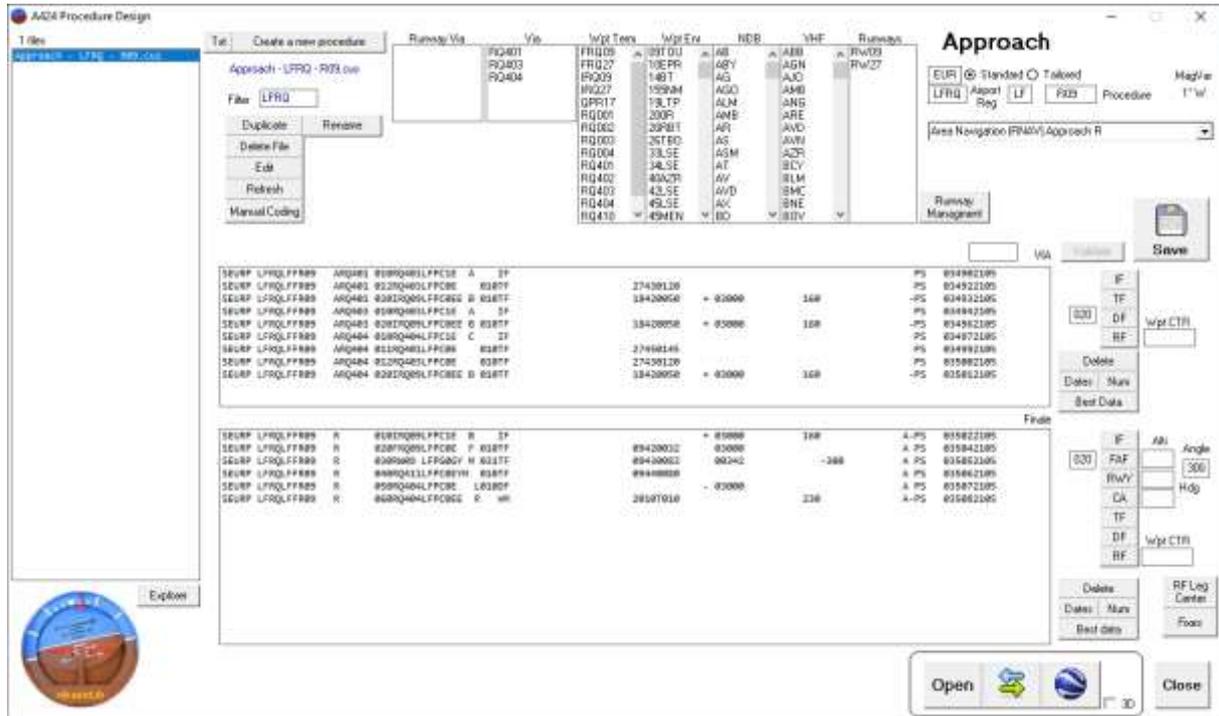
And create a temporary approach to leave the runway adequate.

You open this approach (coordinates) and you save it (Save)

The screenshot shows the software interface with the approach table and a diagram. A green arrow points from the 'Save' button in the right-hand menu to the diagram area.

You go after in the module "Procedure design"

You open this last procedure (here with the filter LFRQ)

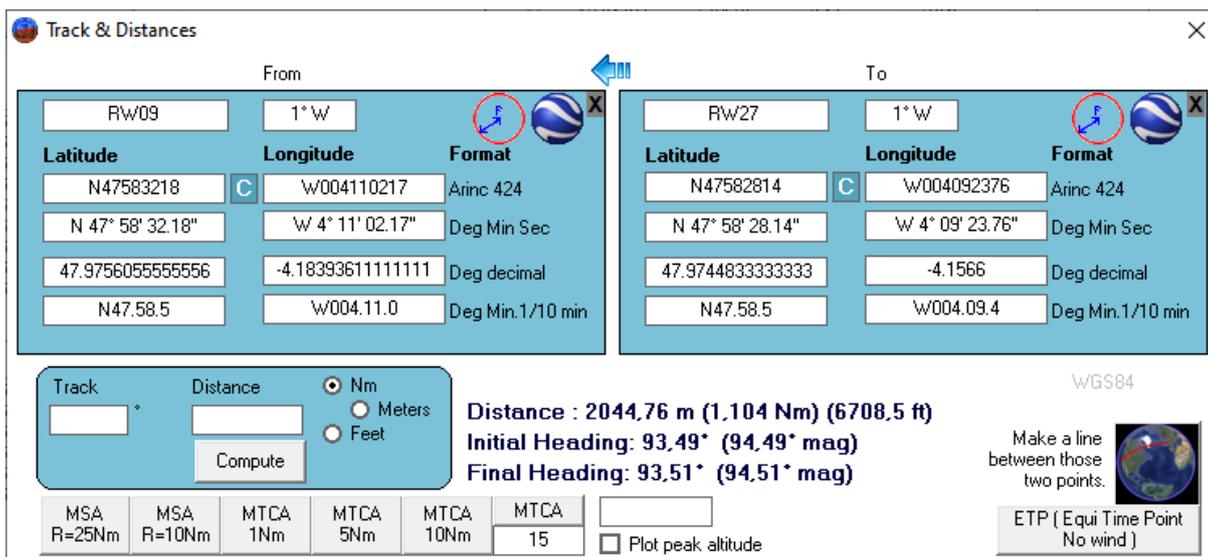


To obtain the exact position on the new threshold I will need to find:

- 1) the true direction of the actual runway
- 2) the position of 700m from the THR in this direction.

1) Select Runway 09 then the compass  then runway 27 and the same compass again:

This window will show:



True direction is 93.5°

2) In track and distance window insert 93.5 and 700 (don't forget to select meters)

Track: 93.5 ° Distance: 700

Nm  
 Meters  
 Feet

Compute

Then press "Compute"

Coordinates are here, but to confirm, press on the google earth button:

RW09 -700m -93.5° 1° W

Google Earth

Latitude	Longitude	Format
N47583080	W004102848	Arinc 424
N 47° 58' 30.80"	W 4° 10' 28.48"	Deg Min Sec
47.9752222222222	-4.1745777777778	Deg decimal
N47.58.5	W004.10.5	Deg Min.1/10 min



This new THR looks like at the right place.

Press on the "C" between the coordinates in the previous module, to copy the coordinates.

Back in the module "Procedure design" press on "Runway management"

Then select runway 09:

Approach - LFRQ - R09.cus

Filter: LFRQ

Runway Management

Ident	Lenh (ft)	Width (ft)	Bearing	Latitude	THR Alt	TCH	DSP Thr
09	7054	148	94	N47583218	293	50	344

Save

We will create a new runway, (Runway 10) starting from actual runway (Runway 09)...

Change it's Identifier, choose one near but different (Some contries take the one after, or before, some other add the letter C as if it was a center runway) Unfortunately, there's no rules !

Here I will take runway 10. (so, in charting, when WIP are activated, Notam will say, active procedure is for runway 10)

I enter the new data... (lenth = 1450m, coordinates pasted)

Runway Edit

Ident	Lenth (ft)	Width (ft)	Bearing	Latitude	THR Alt	TCH	DSP Thr	
10	4757	148	94	N47583080	293	50	344	Save
	Lenth (m)			Longitude				
	1450			W004102848				
					Copy	Paste		

Close

And SAVE.

We now have to code to our "new" runway, so select the Mapt and press on "Fix" to change to RW10 and press on "Validate"

Duplicate

Rename

---

Delete File

---

Edit

---

Refresh

---

Manual Coding

Add Waypoint

▲

RQ001 200R AMB

RQ002 20RBT AR

RQ003 26TBO AS

RQ004 33LSE ASM

RQ401 34LSE AT

RQ402 40AZR AV

RQ403 42LSE AVD

RQ404 45LSE AX

RQ410 45MEN BD

VIA	Row	P/T	Fix	T/D	Hdg	AD	Alt1	Alt2	Ang	RNP:0,3
	30	TF	RW10	G Y	M		94,3	342	-3,00	031

SEURP LFRQLFFR09 ARQ401 010 0401LFPC1E A IF

SEURP LFRQLFFR09 ARQ401 010 03LFPC0E 010TF 27430120

SEURP LFRQLFFR09 ARQ401 020 009LFPC0EE B 010TF 18420050 + 03000

SEURP LFRQLFFR09 ARQ403 010 0403LFPC1E A IF

SEURP LFRQLFFR09 ARQ403 020 009LFPC0EE B 010TF 18420050 + 03000

SEURP LFRQLFFR09 ARQ404 010 04LFPC1E C IF

SEURP LFRQLFFR09 ARQ404 011 01LFPC0E 010TF 27450145

SEURP LFRQLFFR09 ARQ404 012 03LFPC0E 010TF 27430120

SEURP LFRQLFFR09 ARQ404 020 009LFPC0EE B 010TF 18420050 + 03000

SEURP LFRQLFFR09 R 010IR 09LFPC1E B IF + 03000

SEURP LFRQLFFR09 R 020FRQ 09LFPC0E F 010TF 09420032 03000

SEURP LFRQLFFR09 R 030RW09 LFP0GY M 031TF 09430083 00342

SEURP LFRQLFFR09 R 040RQ411LFPC0EYM 010TF 09440080

SEURP LFRQLFFR09 R 050RQ404LFPC0E L010DF - 03000

SEURP LFRQLFFR09 R 060RQ404LFPC0EE R HM 2010T010

After the procedure will have to be renamed by it's new THR name...

EUR  Standard  Tailored  MagVar  
 LFRQ  Airport Reg  LF  R1Q  1° W  
 Area Navigation (RNAV) Approach R

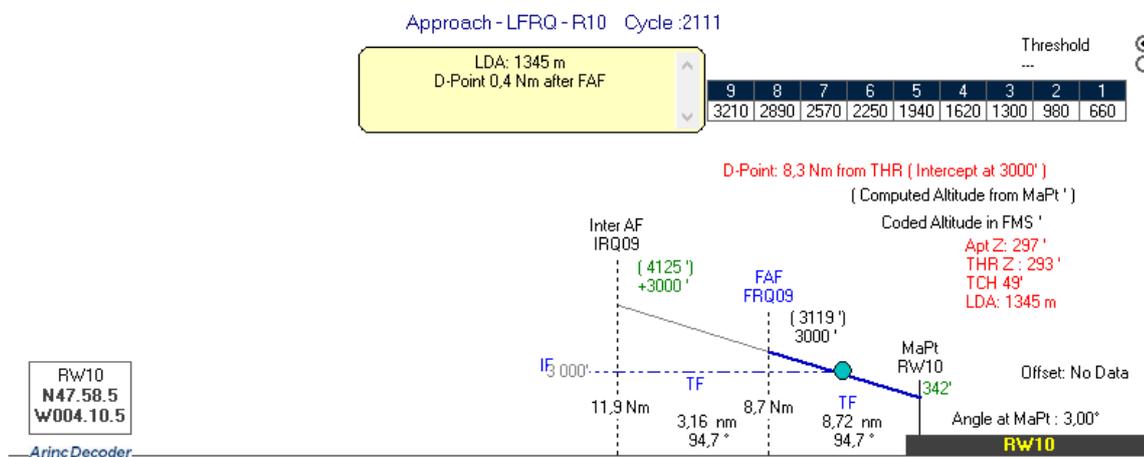
Replace R09 by R10 (Or R10-V, or what ever)

And press button “rename”

When OK, save it



We see now that the altitude at the FAF is not the good one with this new path angle:



The good altitude should be 3119 ' at FRQ09. (on a 3 degrees path)

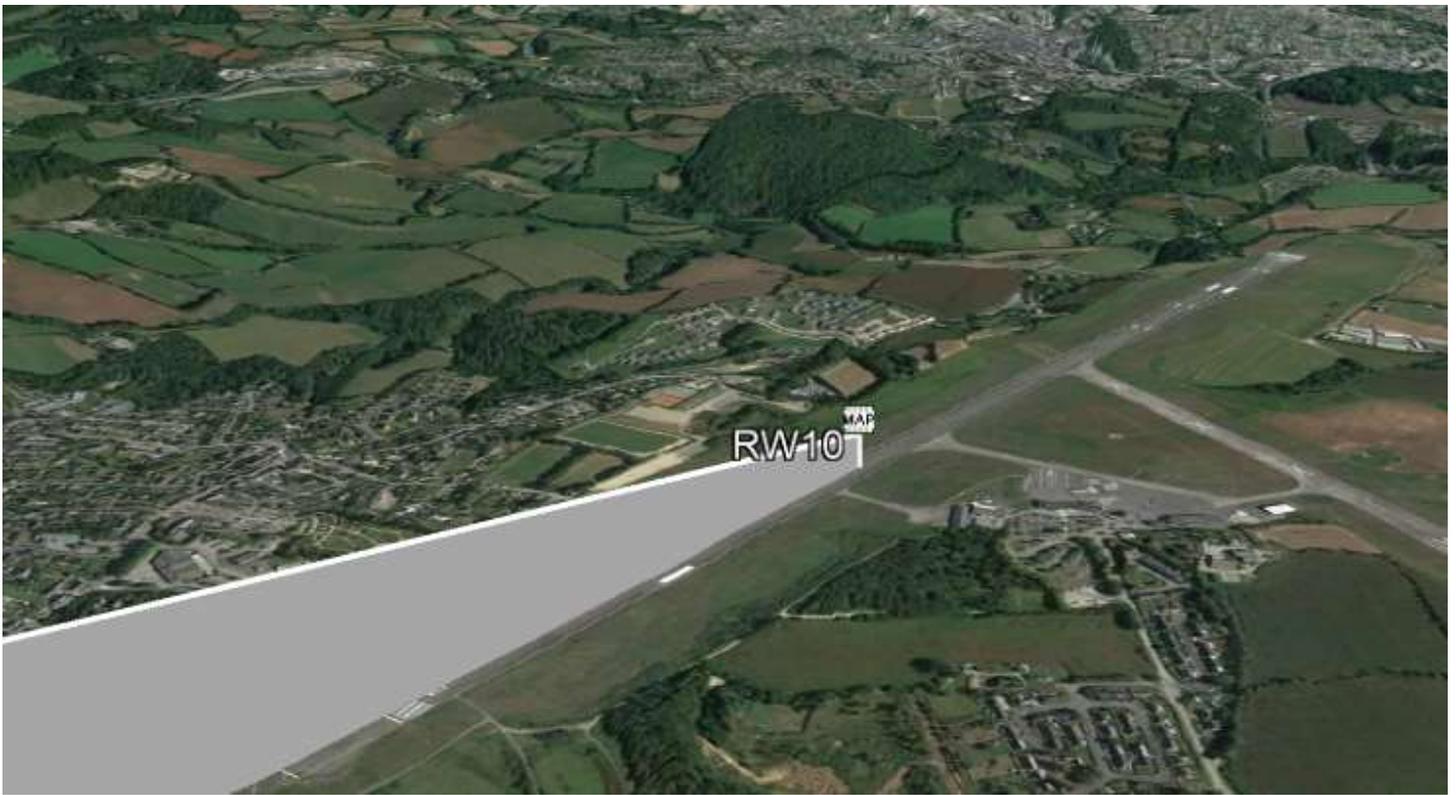
But because 3000' is the altitude of the arms transitions, those altitudes are protected in those trajectories at this altitude, the path will be captured after the FAF (0.4nm after) and the plane will descend on the new path for the new threshold.

Because we are above the old runway we are sure there is no issues with any obstacle.

**⚠** take care, this exercise is OK because the runway is reduced in length !

If the runway was lengthened, the issue would be strictly different... because the aircraft would fly at lowest altitude at the same positions... If the runway is lengthened, the computation has to be fully redone locally with local obstacles.

So the new coding of this approach can be tested in full flight simulator and if OK can be authorized to be incorporate in the FMS of your fleet.



To compare with...



[Link to the software....](#)