

Creating an approach for FMS, from a VPT (Visual with Prescribed Track) coding, to help like a RNAV Visual approach)

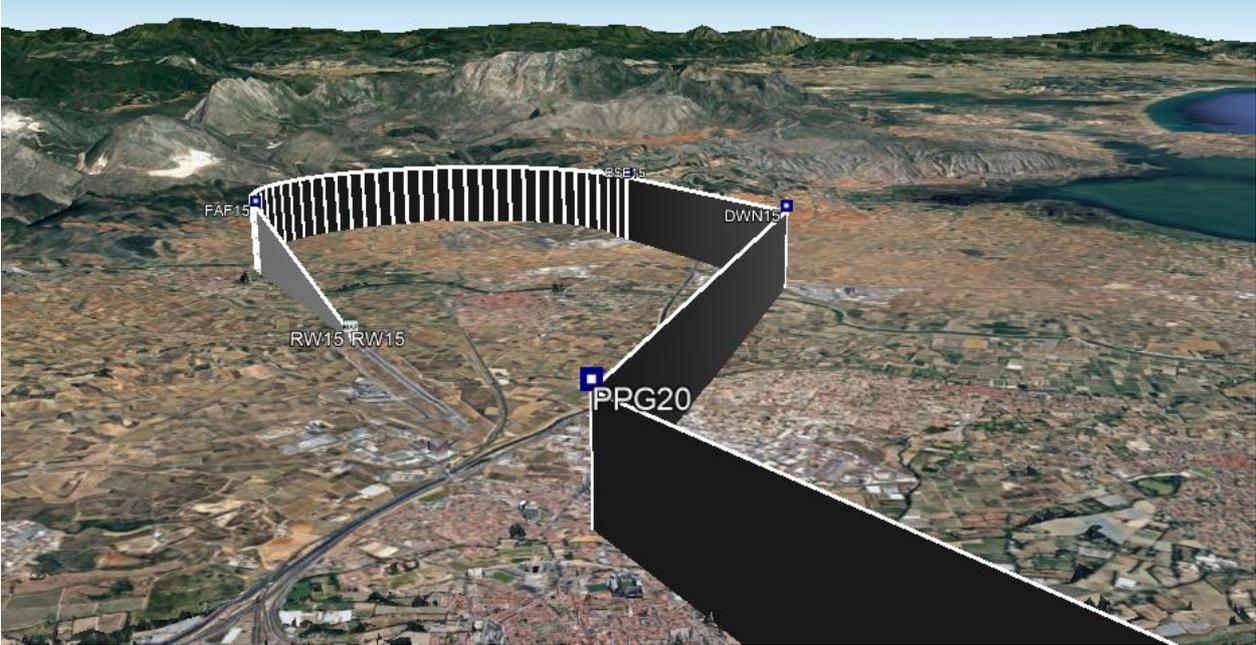


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You need to help pilots to fly this procedure... easy with a coding and Arinc Decoder :

APPROCHE AUX INSTRUMENTS

PERPIGNAN RIVESALTES

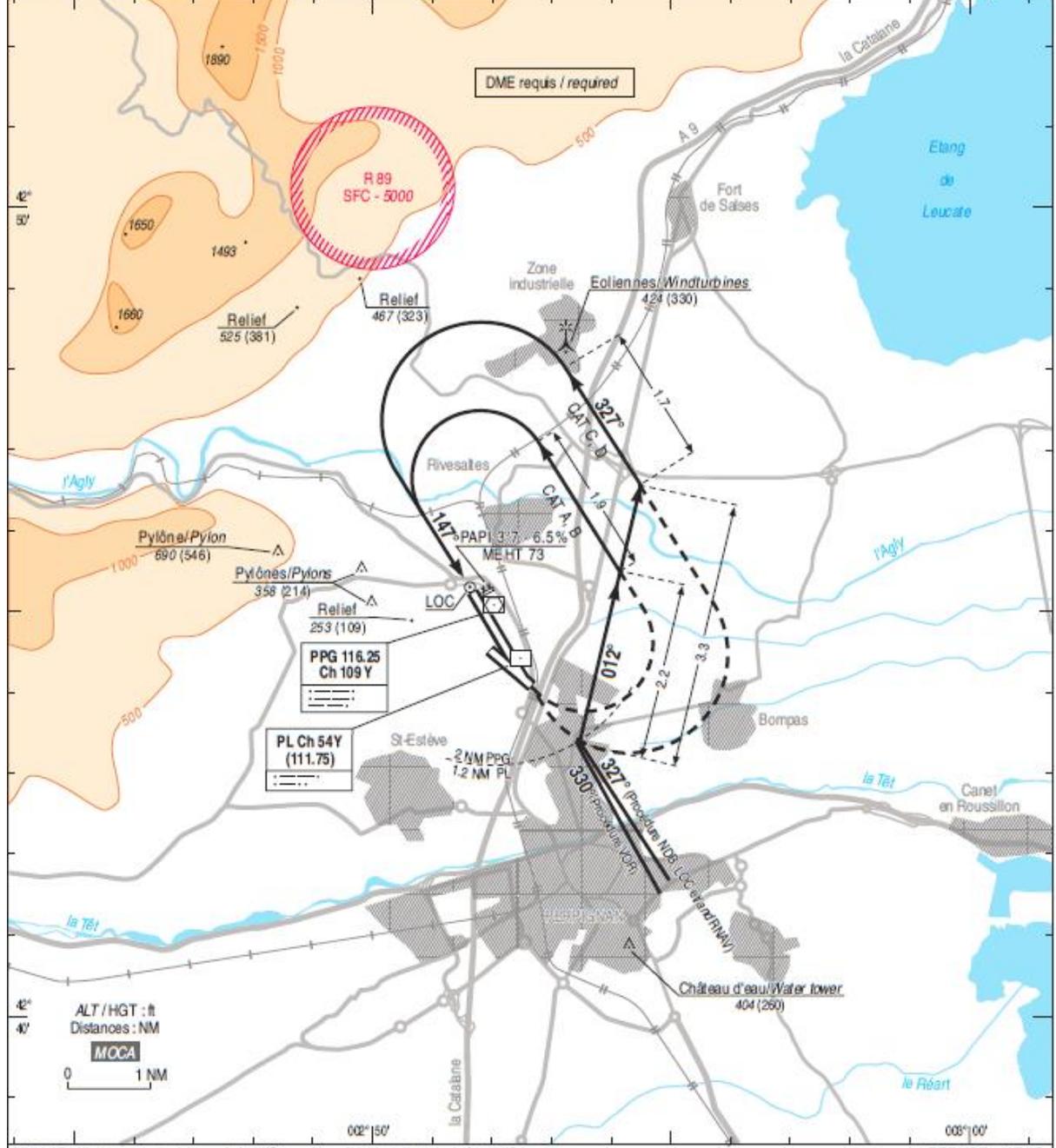
Instrument approach

CAT A B C D

ALT AD : 144 (6 hPa), THR : 130

VPT RWY 15

ATIS PERPIGNAN	127.880	VAR
APP : MONTPELLIER Approche/Approach	Voix/See AD 2 LFMP COM 01	1°E
TWR : PERPIGNAN Tour Tower	Voix/See AD 2 LFMT COM 01	(15)



MNM AD : distances verticales en pieds, VIS en mètres./ Vertical distance in feet, VIS in meters REF HGT : ALT AD

CAT	VPT	
	MDA (ft)	VIS
A	620 (470)	1500
B	650 (500)	1800
C	920 (780)	2400
D	970 (830)	3600

Observations/Remarks : NIL.



For runway 33 there's a coded and official approach RNAV, we will take 2 first fixes and then fly the circling.

When at 2 PPG you “open” to the right hdg 012° for 3.3 Nm (cat C coding) then heading 327 for 1.7 Nm then U turn left to the final.

We will code a RF, but 2 TF could be OK for olds aircrafts that don’t fly RFs....

Visual approach so no missed approach coded.

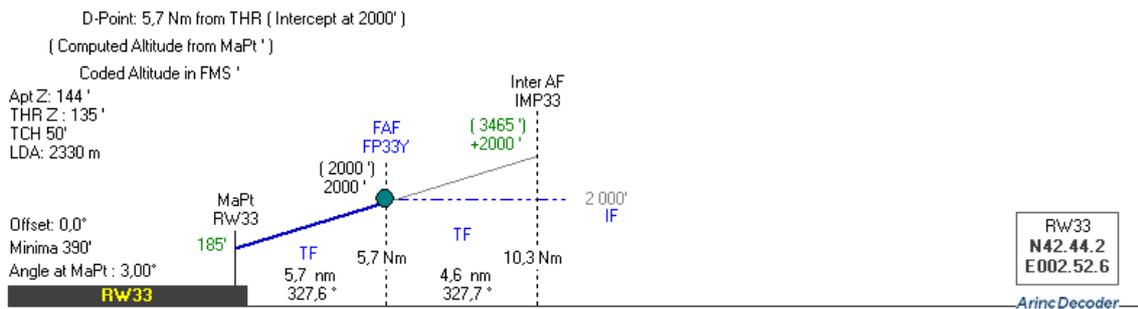
I start with the existing FACF and FAF of the RNAV 33 –Y (Z is a LPV approach)

Approach - LFMP - R33-Y										Perpignan / Rivesaltes				Mag Var : 01.0° E				
Via	Seq	Pt	Fix	Typ	F/D	TD	Mag	Crs	Alt 1	Alt 2	Vert Angle	RNP	Speed Limit	Distance Time	Coordinates Fix	Rec Navaid	Cycle :2008	Update
LANET	10	IF	LANET	IAF Hold					FL070	3000			220 Kts		N42.42.2 E003.06.4		Transition	2001
LANET	20	TF	MP400				174°	+	2000			1	220 Kts	6,3 Nm	N42.35.9 E003.07.2		Transition	1905
LANET	30	TF	IMP33	Inter AF			263.8°	+	2000			1	185 Kts	5,4 Nm	N42.35.4 E002.59.9		Transition	1801
	10	IF	IMP33	Inter AF				+	2000				185 Kts		N42.35.4 E002.59.9			2001
	20	TF	FP33Y	FAF			327.3°		2000			1		4,6 Nm	N42.39.3 E002.56.7			2001
	30	TF	Rw33	MaPt	FO		327.3°		185		-3,00°	0,3		5,7 Nm	N42.44.2 E002.52.6			2001
	40	CA		Go.Arr			328°	+	480			1	185 Kts					2001
	50	CF	BAMGO				43°	-	3000			1	185 Kts	7 Nm	N42.52.9 E003.02.4	PPG		2007
	60	TF	MP411		FO		133,1°	-	3000			1	205 Kts	3 Nm	N42.50.8 E003.05.3			2001
	70	DF	LANET					-	3000			1	220 Kts		N42.42.2 E003.06.4			2001
	80	HM	LANET		R		174°					1	220 Kts	1 Min	N42.42.2 E003.06.4			2001

Threshold
 ○ ...

Approach - LFMP - R33-Y Cycle :2008

1	2	3	4	5	6
500	820	1140	1460	1780	2100



IMP33 +2000 and FP33Y at 2000.

Then I have to find the waypoint on the final at 2Nm PPG ([Step 1](#))

Then I have to compute from this point 3.3 Nm the waypoint in the 012° ([Step 2](#))

Same, 1.7Nm in the 327, another wpt at the end of the downwind leg. ([Step 3](#))

Left turn to final, with RF, need to determine the Runway axis and the Final Fix perfectly aligned ([Step 4](#)).

Prepare the coding ([Step 5](#))

Determinate where has to be the RF center fix ([Step 6](#))

Determine the vertical profile. ([Step 7](#))

Step 1, determine if the waypoint PPG 2 exists in our A424 file:

Plot all the terminal waypoints of LFMP.

ARINC Decoder V.4.7 Air France version

Main Screen **Arinc2008 - Actual Cycle (16 jul 20 -> 13 août 20)** Stop 304 datas EUR Airport (LFMP)

Map D.O.F Fixes MTCA Procedure Design Co-Routes / Catalog ATC Route Queries Help

Import Export Save the list Of Selected Datas Un Select All Select All Reverse
 Cls Select this List 32 data(s) Compare Sort

LFMP - 11PPG - N42.52.9	E003.02.4
LFMP - 29PPG - N42.28.7	E003.24.5
LFMP - 70PPG - N42.38.4	E002.55.0
LFMP - 90PPG - N42.37.2	E002.57.9
LFMP - FP33Y - N42.39.3	E002.56.7
LFMP - FP33Z - N42.39.4	E002.56.6
LFMP - IF33 - N42.35.6	E002.59.7
LFMP - I133 - N42.37.1	E002.58.5
LFMP - IMP33 - N42.35.4	E002.59.9
LFMP - MAP33 - N42.43.7	E002.53.0
LFMP - MP002 - N42.50.1	E002.58.6
LFMP - MP400 - N42.35.9	E003.07.2
LFMP - MP410 - N42.45.6	E002.51.4
LFMP - MP411 - N42.50.8	E003.05.3
LFMP - ORTEL - N43.03.8	E002.52.1
LFMP - PPG11 - N42.35.4	E002.59.2
LFMP - PPG18 - N42.43.5	E002.53.2
LFMP - PPG20 - N42.43.3	E002.53.3
LFMP - PPG29 - N42.42.5	E002.54.0
LFMP - PPG32 - N42.42.2	E002.54.1

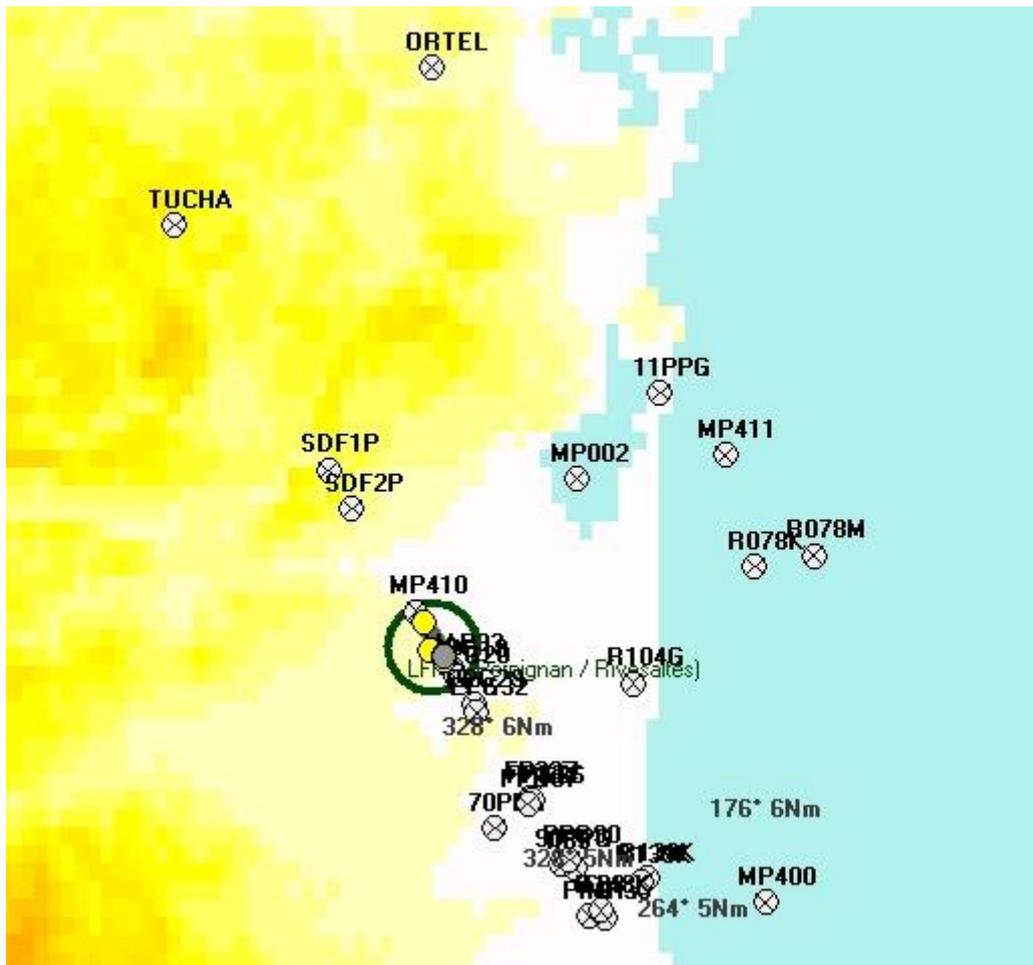
Group v8 Micro Station Map ARINC Coding

Char # 13 22 7 8 9 10 14 15 16 17 18 Value C 1

Filter
 Airport
 Runways 4
 ILS Markers GLS
 Com freq 6 SBAS Path Point 1
 MSA Parkings 14
 Terminal Wpts 32
 15 SIDs
 6 STARs
 8 Approaches

Effectivity 2008
 32 results
 Search

And



Plot PPG and create a circle of 2Nm around

ARINC Decoder V.4.7 Air France version

Main Screen **Arinc2088 - Actual Cycle (16 jul 20 -> 13 août 20)** Stop 5 380 datas **EUR** Nav aids (VHF/NDB)

Map D.O.F Fixes MTCA Procedure Design Co-Routes / Catalog ATC Route Queries Help File

Primary Code: S E U R D

Codage: Standard Tailored

South Pacific

Arinc Zone:

- Canada
- USA
- Latin America
- South America
- Europa**
- Africa
- North Pacific
- Russia Asia
- Middle East
- South Pacific
- All World !

Search:

- Airport
- Waypoints
- Holding patterns
- Nav aids (VHF/NDB)**
- PRD Zones
- FIR/UIR
- Airspaces
- Airways
- MORAs

ICAO Code: [] [] [] [] [] []

World Map showing regions: CAN, USA, PAC, TAM, SAM, SPA, EUR, MES, EEU, PAC.

Buttons: Configuration, About, Load

Nav aids Table:

Ident	Frequency	Class	Mag Var	DME	Latitude	Longitude	Elev	BIAS	Fig of Merit
PPG	116.250	VDLW	1° E	PPG	N42450170	E002520170	00151	0	40 Nm

Name: PERPIGNAN RIVESALTES, UpDate: 1609

Notes: VOR DME Low Altitude, No Voice on Frequency, Collocated Nav aids, Frequency Protected for 566 Nm.

Char # 6 22 20 21 14 15 16 17 18

Value 1 P P G

Nav aid selection:

- VHF
- ILS
- NDB
- All**

Region (2 char): [] []

Ident: PPG

Terminal NDB

Activity: 2008

Search: 1 result

MORAs

Nav aid Table:

Ident	Frequency	Class	Mag Var	DME	Latitude	Longitude	Elev	BIAS	Fig
PPG	116.250	VDLW	1° E	PPG	N42450170	E002520170	00151	0	

Name: PERPIGNAN RIVESALTES, UpDate: 1609

Notes: VOR DME Low Altitude, No Voice on Frequency, Collocated Nav aids, Frequency Protected for 566 Nm.

Char # 6 22 20 21 14 15 16 17 18

Value 1 P P G

Track & Distances

From: PPG, 1° E

To: [] []

Latitude: N42450170, Longitude: E002520170, Format: Arinc 424

Latitude: N 42° 45' 01.70", Longitude: E 2° 52' 01.70", Format: Deg Min Sec

Latitude: 42.7504722222222, Longitude: 2.86713888888889, Format: Deg decimal

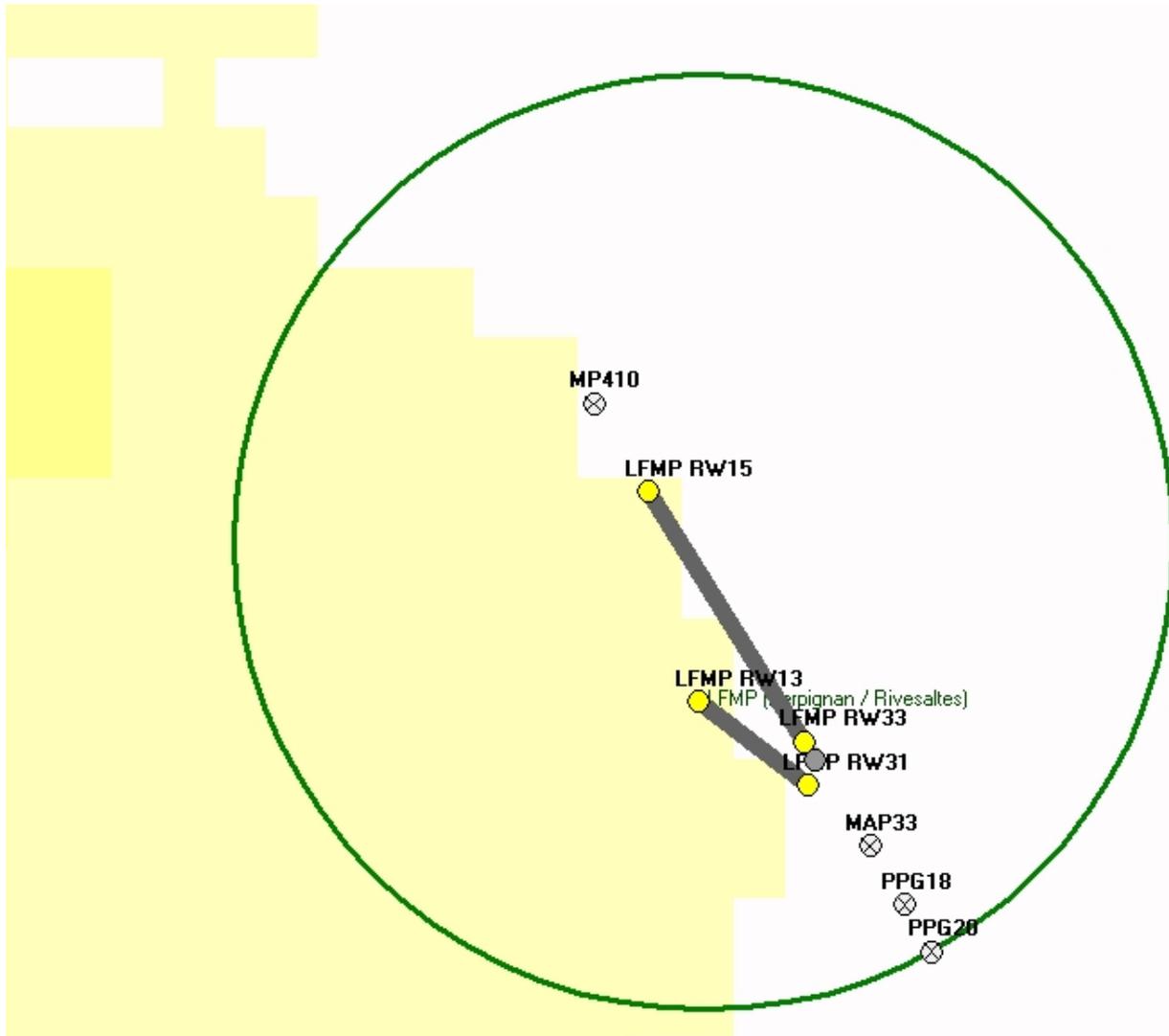
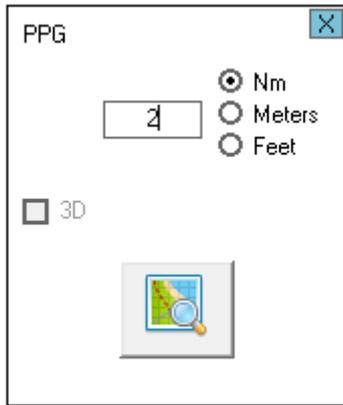
Latitude: N42.45.0, Longitude: E002.52.0, Format: Deg Min.1/10 min

Track: [] Distance: [] Nm Meters Feet

Compute

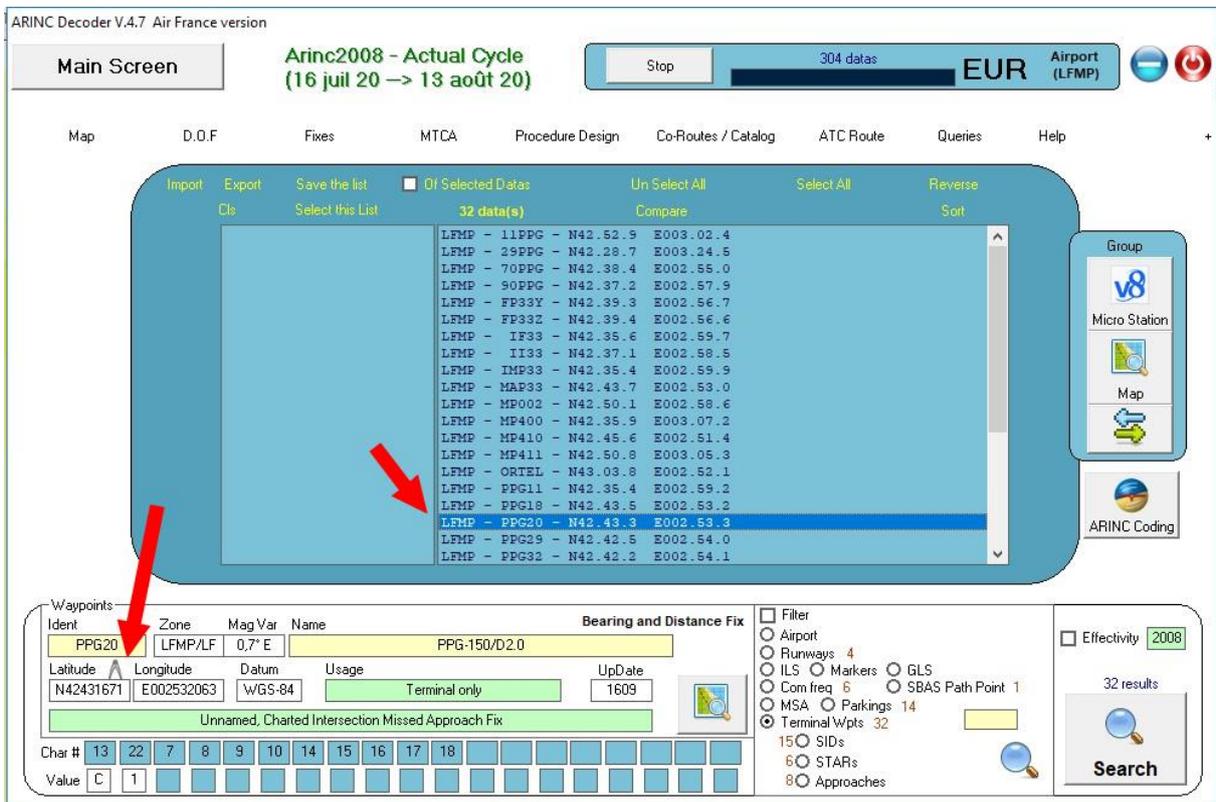
MSA R=25Nm, MSA R=10Nm, MTCA 1Nm, MTCA 5Nm, MTCA 10Nm, MTCA 15

Plot peak altitude:



YES !!!! 2PPG already exists in runway axis and its name is easy to remember... PPG20

Find it, and same, select it's compass.

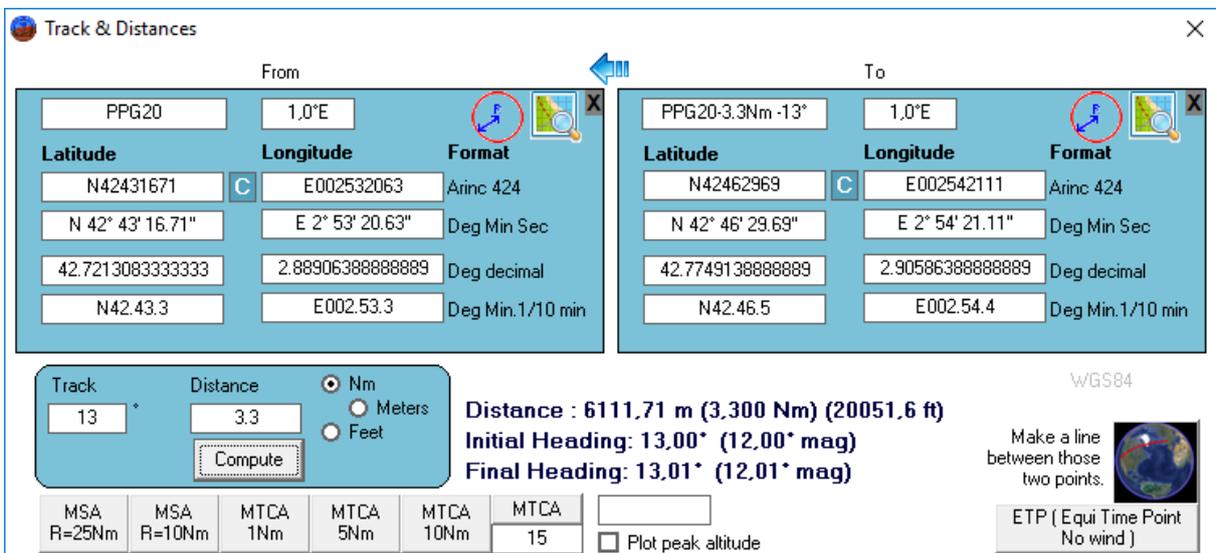


The fix is plotted in the left square.

Step 2: From there we want to compute a waypoint 3.3 Nm in the mag12°

First, find the good magvar, the one coded in the waypoint is never updated, so if the waypoint is 20 years old... MagVar is wrong...

The airport magvar is 1°E. We can change this value.



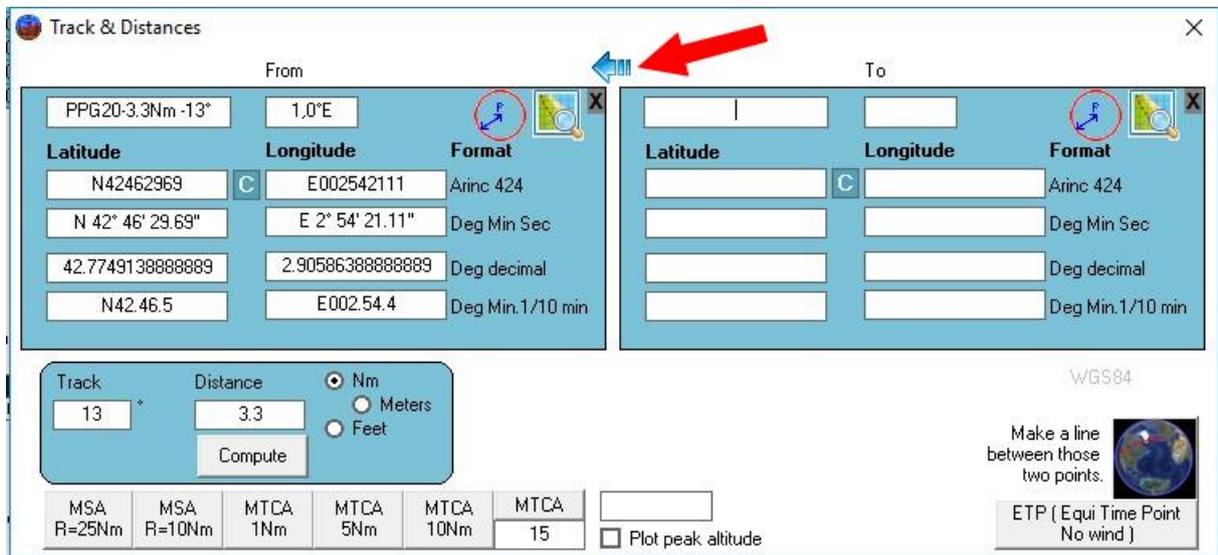
So enter 13° track, 3.3Nm distance and press "compute". The waypoint will be in the right box.

Press on the "C" between Lat and Lon; to copy somewhere those coordinates we will use later.

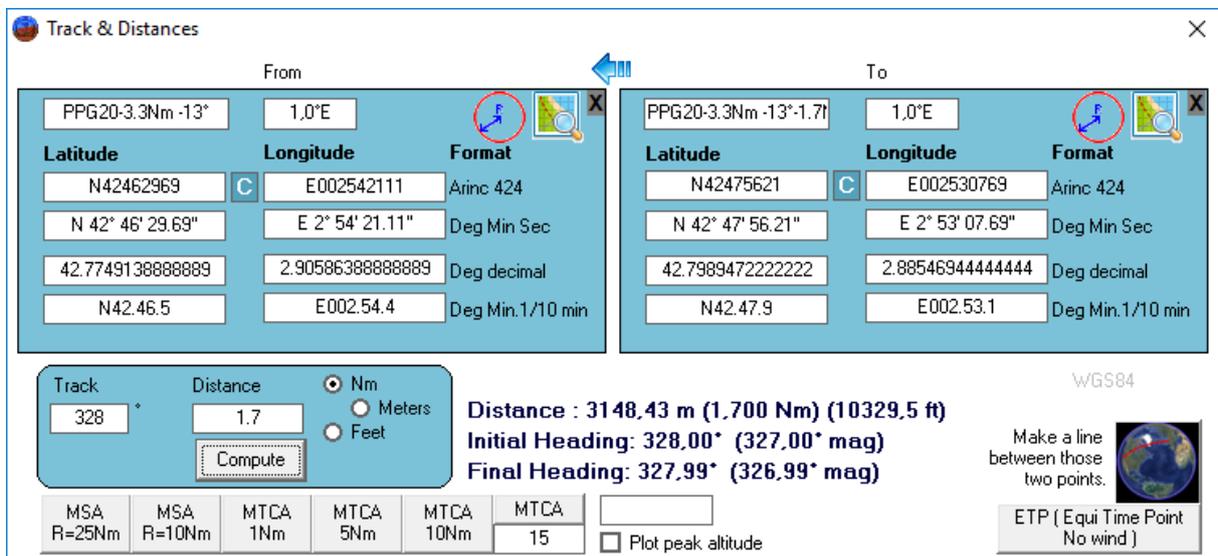
DW15 :N42462969E002542111

Step 3... from this point, in the 327 for 1.7 Nm, create a new Waypoint.

Press on the arrow in the middle of the form, to put this last point in the left box.



And again, insert 1.7, in the 328 (327+1) compute and you can copy (by pressing "C") the coordinates in your working file.



BL15: N42475621E002530769

Step 4: The final has to be in the runway axis.

Open the runways of LFMP and click in the compass RW33 then RW12 to have the initial heading.

ARINC Decoder V.4.7 Air France version

Main Screen **Arinc2008 - Actual Cycle (16 juillet 20 → 13 août 20)** Stop 304 datas EUR Airport (LFMP)

Map D.O.F Fixes MTCA Procedure Design Co-Routes / Catalog ATC Route Queries Help

Import Export Save the list Of Selected Datas Un Select All Select All Reverse
 Cls Select this List 4 data(s) Compare Sort

- LFMP - RW13 - Macadam
- LFMP - RW15 - Macadam
- LFMP - RW31 - Macadam
- LFMP - RW33 - Macadam

Group
 V8
 Micro Station
 Map
 ARINC Coding

ASDA: 2500m
 LDA: 2330m
 TORA: 2500m
 TODA: 2500m

Runways

Airport	THR	Lenh	Width	Heading	THR Alt	TCH	TakeOff Path	Landing THR
LFMP	RW33	8202' (2500 m)	148' (45 m)	328°	135'	52'		

Latitude Longitude Displaced THR Stopway ILS ILS Class UpDate
 N42441053 E002523608 558' (170 m) 0' (0 m) PL 1 1905

Macadam PCN: 060 F/C/W/T

Char # 13 22 7 8 9 10 14 15 16
 Value G 1

Trajectoire N-1
 Filter
 Airport
 Runways 4
 ILS Markers GLS
 Com freq 6 SBAS Path Point 1
 MSA Parkings 14
 Terminal Wpts 32
 15 SIDs
 6 STARs
 8 Approaches

Effectivity 2008
 4 results
 Search

The Track & distance module will show this:

Track & Distances

From To

RW33 RW15

Latitude	Longitude	Format
N42441053	E002523608	Arinc 424
N 42° 44' 10.53"	E 2° 52' 36.08"	Deg Min Sec
42.73625833333333	2.876688888888889	Deg decimal
N42.44.2	E002.52.6	Deg Min. 1/10 min

Latitude	Longitude	Format
N42451484	E002514216	Arinc 424
N 42° 45' 14.84"	E 2° 51' 42.16"	Deg Min Sec
42.75412222222222	2.861711111111111	Deg decimal
N42.45.2	E002.51.7	Deg Min. 1/10 min

Track Distance Nm Meters Feet

Distance : 2332,81 m (1.260 Nm) (7653,6 ft)
 Initial Heading: 328,29° (T)
 Final Heading: 328,28° (T)

MSA R=25Nm MSA R=10Nm MTCA 1Nm MTCA 5Nm MTCA 10Nm MTCA 15

Plot peak altitude

WGS84
 Make a line between those two points.
 ETP (Equi Time Point No wind)

Put RW15 on the left (middle top blue arrow)

Track & Distances

From: RW15

To: RW15-5Nm -328.29°

From		To	
Latitude	Longitude	Latitude	Longitude
N42451484	E002514216	N42493007	E002480788
N 42° 45' 14.84"	E 2° 51' 42.16"	N 42° 49' 30.07"	E 2° 48' 07.88"
42.7541222222222	2.86171111111111	42.8250194444445	2.80218888888889
N42.45.2	E002.51.7	N42.49.5	E002.48.1

Track: 328.29° Distance: 5 (Nm) Compute

Distance : 9259.95 m (5,000 Nm) (30380.4 ft)
 Initial Heading: 328.29° (T)
 Final Heading: 328.25° (T)

WGS84

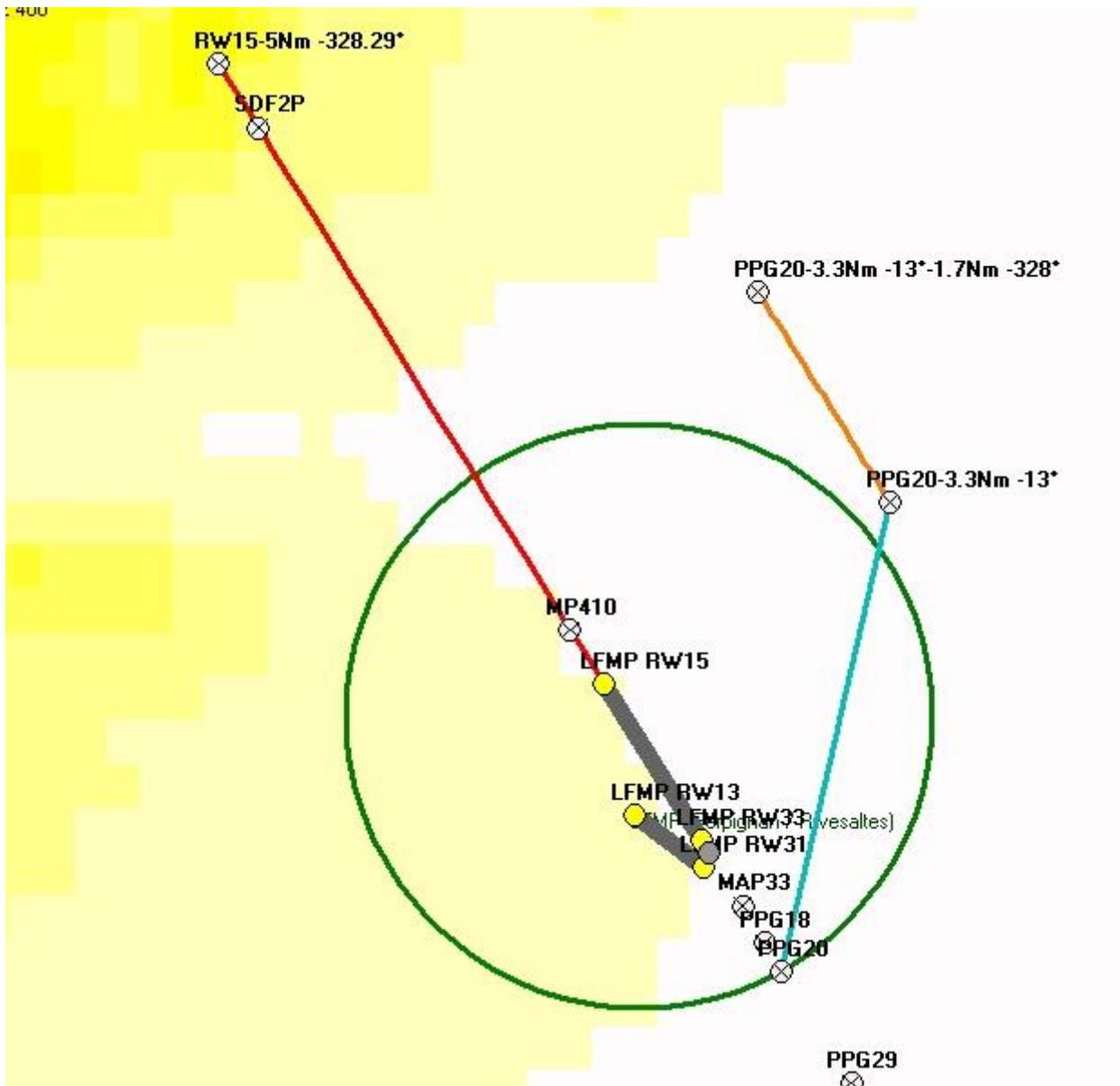
Make a line between those two points.

ETP (Equi Time Point No wind)

MSA R=25Nm MSA R=10Nm MTCA 1Nm MTCA 5Nm MTCA 10Nm MTCA 15

Plot peak altitude

Track 328.29, distance 5 (example first) + Compute + Plot. Then button make a line between those 2 points.



N42493007E002480788 = 5Nm Final.

So... we now need to find the RF between the DWN leg and the Final Leg.

Easy....

We have enough material to start the coding.

Step 5: Prepare the coding.

Open "Procedure Design"



Create a new procedure.... Enter LFMP and give a name... R15-C for Circling 15.

A screenshot of a form for creating a procedure. At the top, there is a text input field containing 'R15-C'. Below it, there is a label 'Airport' and two text input fields: the first contains 'LFMP' and the second contains 'LF'. Underneath, there are three radio button options: 'SID', 'STAR', and 'Approach'. The 'Approach' option is selected. At the bottom of the form is a large button labeled 'Get the basic data'.

Press "Get the basic data"

Save it and select its type:

A screenshot of a dialog box titled 'Approach'. At the top, there are two radio buttons: 'Standard' (selected) and 'Tailored'. To the right, there is a label 'MagVar' and a text input field containing '1° E'. Below this, there are several text input fields: 'EUR', 'LFMP', 'Airport Reg', 'LF', 'R15-C', and 'Procedure'. At the bottom, there is a dropdown menu showing a list of approach types: 'Global Positioning System (GPS) Approach P', 'Non-Dir Beacon + DME (NDB+DME) Approach Q', 'Area Navigation (RNAV) Approach R' (highlighted in blue), 'VOR Approach using VORDME/VORTAC S', 'TACAN Approach T', 'VOR Approach V', and 'Loc Directional Aid (LDA) Approach X'. Below the dropdown are three buttons: 'VIA', 'Validate', and 'Save'.

We can select IMP33 for first point, (IF)

Via	Wpt Term	Wpt Enr	NDB	VHF	Runways
	11PPG	09TOU	AB	ABB	Rw13
	29PPG	10EPR	ABY	AGN	Rw15
	70PPG	155NM	AG	AJO	Rw31
	90PPG	19LTP	AGO	AMB	Rw33
	FP33Y	200R	ALM	ANG	
	FP33Z	20RBT	AMB	ARE	
	IF33	26TBO	AR	AVD	
	II33	32CLM	AS	AVN	
	IMP33	33LSE	ASM	AZR	
	MAP33	34LSE	AT	BCY	
	MP002	42LSE	AV	BLM	
	MP400	43LSE	AVD	BMC	
	MP410	45NM	AX	BNE	
	MP411	4600E	RD	BRY	

Approach

EUR Standard Tailored MagVar 1° E

LFMP Airport Reg LF CRC15 Procedure

Area Navigation (RNAV) Approach R

VIA Validate Save

IF TF DF Wpt CTR RF

Delete Dates Num Best Data

Final 2008

IF Alt Angle 020 FAF 300 RWY Hdg CA TF DF Wpt CTR

And then save it.

Then PPG20. Select it and press "TF"

The points after are custom and have been created in the steps before...

Press to save their coordinates:

Waypoint

Name

Coordinates

Mag Var

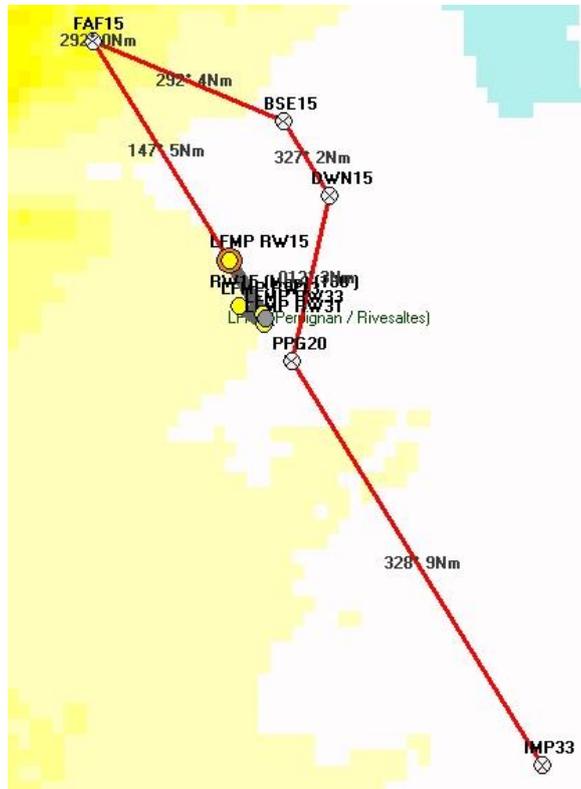
copy/paste datas then press OK.

Going on with the point 5Nm from runway, call it FAF, it will obviously be displaced later.

And finish with the runway 15. (press RWY , let the angle at 3°, we'll change it after) The altitude will be by default 50' above runway threshold.

Save.

If you plot it... this will be shown... it's not finish at all.



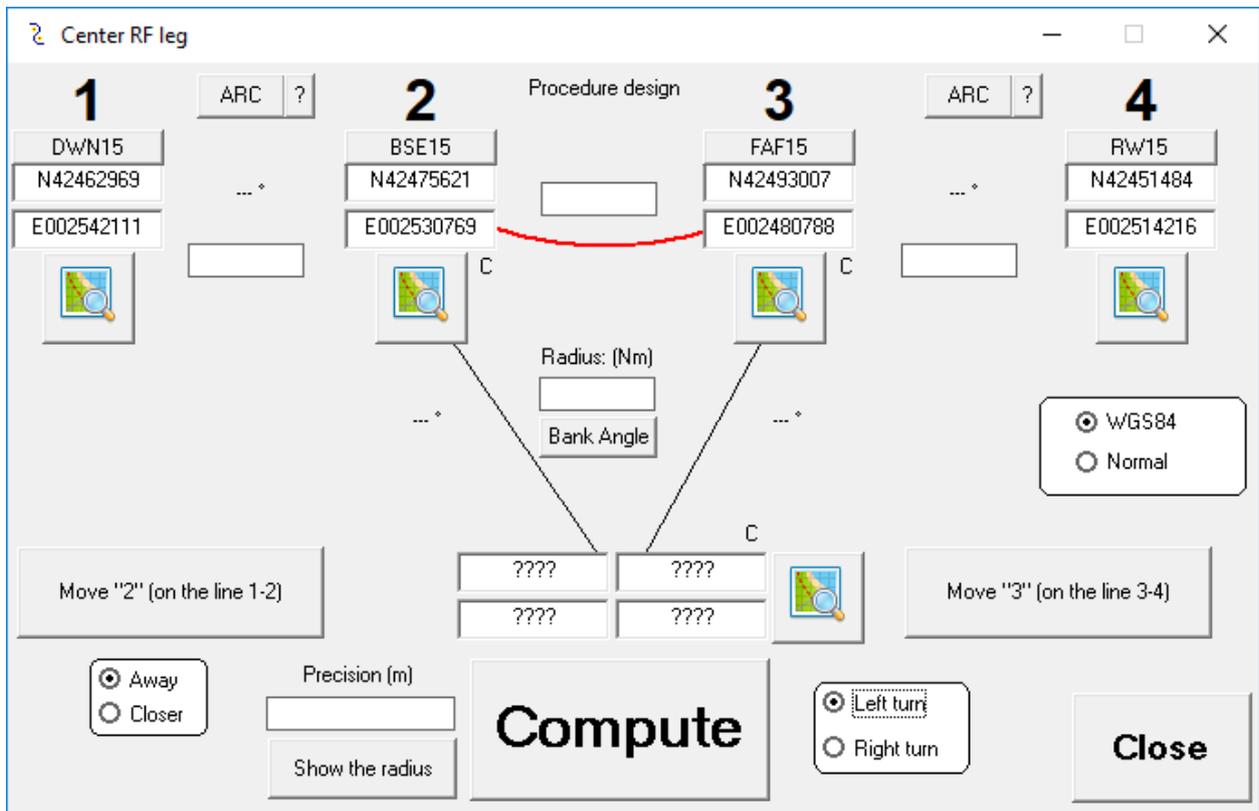
Step 6: code a RF leg between downwind leg to finale leg.

RF Leg
Center

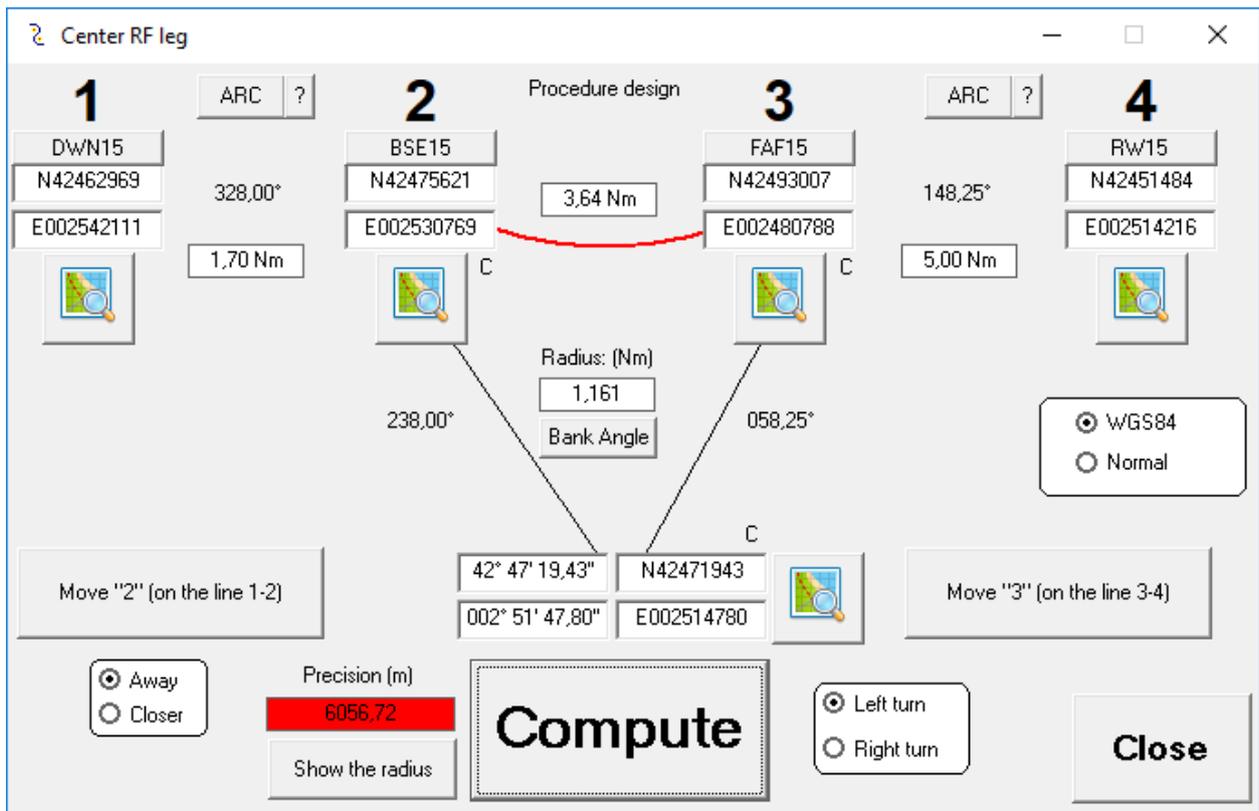
In the same module, click on

Select each waypoint and import them by clicking on the “import” buttons.

Do that for 4 points, this to join the 2 lines. 1-2-3-4 will be DWN15-BSE15- FAF15-RWY15, like this:

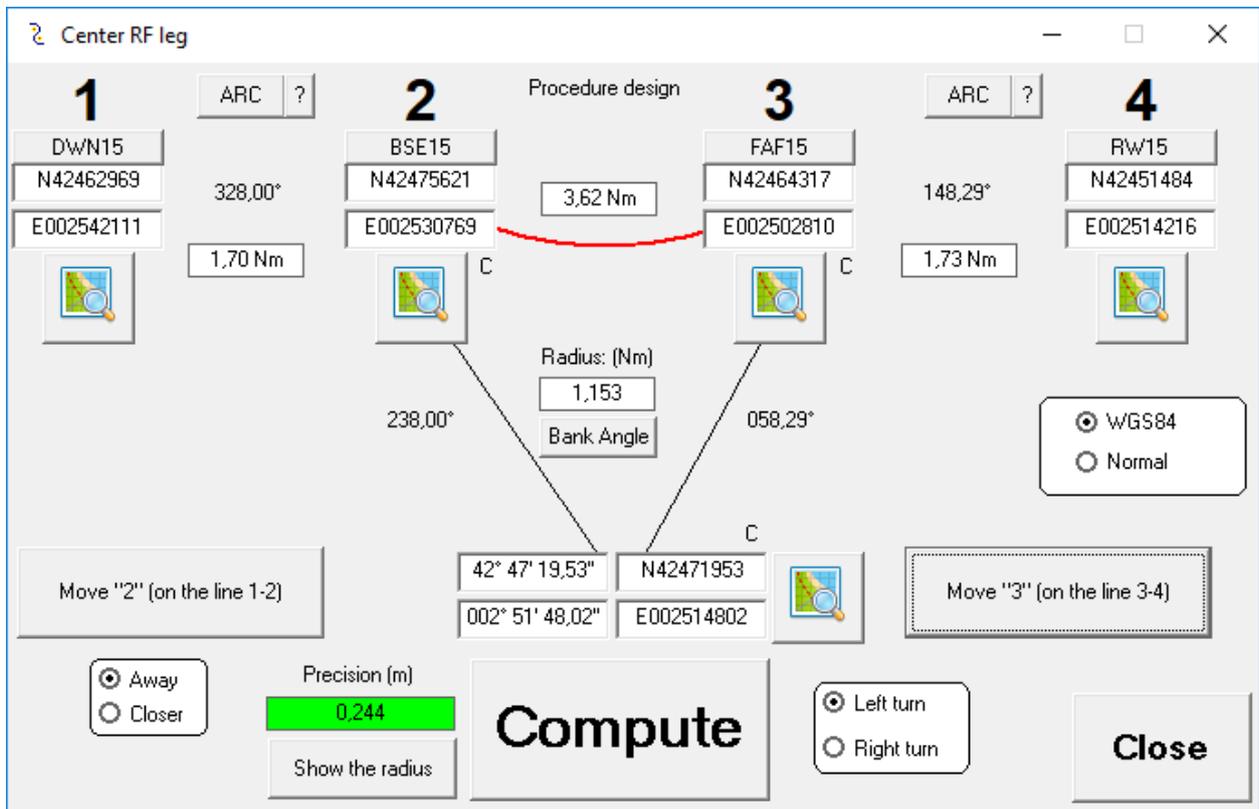


Indicate it's a left turn and click on "Compute"



It doesn't work and it's normal, we know that the FAF15 is not at the right place... (We only place it on the runway axis, the 5Nm distance had no sense)

So we can redo the computation by moving "3" on the line 3-4 (if it's going worse, change the "Away" or "Closer") and when it's going better, do it until the "Precision" value doesn't change and the precision is enough...



Now the precision is of 24 centimetres (we can't get better with A424 coordinates in 1/100 seconds)

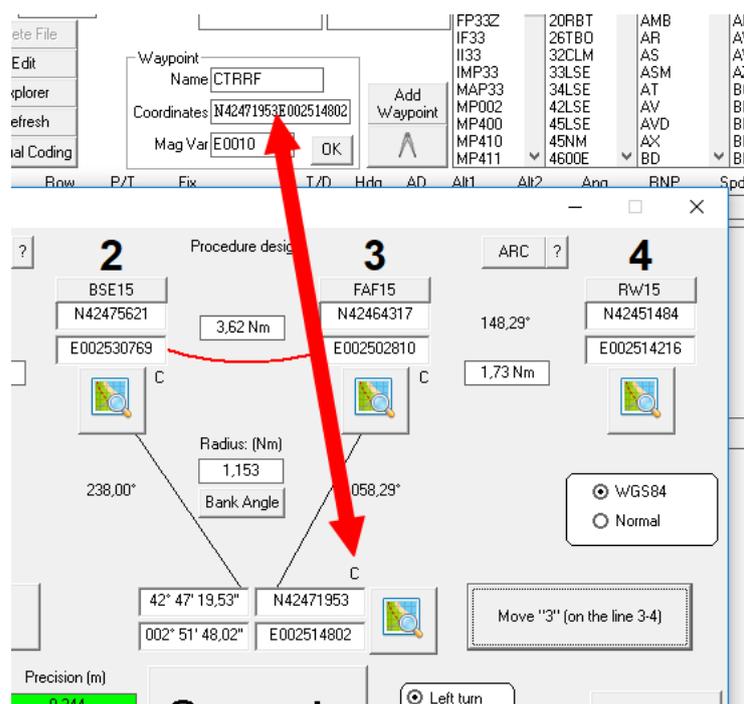
We have the new position of the FAF and the Center Fix of the RF leg.

Press the little "C" below FAF coordinates, which will put them in the clipboard.

In the Procedure design module, select the FAF15 waypoint, press on delete, then do a new FAF15 with coordinates pasted.

Create a new waypoint for the RF center...

"Add Waypoint", name it CTRRF (example of course) and paste the coordinates you copy when clicking in the "C" above center coordinates...



In our coding, remove the line with the TF FAF15

SEURP	LFMPLFFCRC15	C	040BSE15LFPC0E	TF	2008
SEURP	LFMPLFFCRC15	C	050FAF15LFPC0E	TF	2008
SEURP	LFMPLFFCRC15	C	060RW15 LFPG0GY M	TF	2008

Then,

Give the number 50 for the line we will put (the same than the line we removed)

Indicate the CTR will be CTRRF

Select the FAF15 waypoint to go to.

VIA	Row	P/T	Fix	T/D	Hdg	AD	Alt1	Alt2	Ang	RNP	Spd	Distance	CTR-turn	Arc Radius	Rec Nav
	50	TF	FAF15	E											

SEURP	LFMPLFFCRC15	C	010IMP33LFPC0E	I	IF	2008
SEURP	LFMPLFFCRC15	C	020PPG20LFPC0E	TF	2008	
SEURP	LFMPLFFCRC15	C	030DWN15LFPC0E	TF	2008	
SEURP	LFMPLFFCRC15	C	040BSE15LFPC0E	TF	2008	
SEURP	LFMPLFFCRC15	C	060RW15 LFPG0GY M	TF	2008	

Finally, Press "RF"

The line will be inserted... but things are missing...

VIA	Row	P/T	Fix	T/D	Hdg	AD	Alt1	Alt2	Ang	RNP	Spd	Distance	CTR-turn	Arc Radius	Rec Nav
	50	RF	FAF15	E									CTRRF		

SEURP	LFMPLFFCRC15	C	010IMP33LFPC0E	I	IF	2008
SEURP	LFMPLFFCRC15	C	020PPG20LFPC0E	TF	2008	
SEURP	LFMPLFFCRC15	C	030DWN15LFPC0E	TF	2008	
SEURP	LFMPLFFCRC15	C	040BSE15LFPC0E	TF	2008	
SEURP	LFMPLFFCRC15	C	050FAF15LFPC0E	RF	CTRRF	2008
SEURP	LFMPLFFCRC15	C	060RW15 LFPG0GY M	TF		2008

If you select the line, red boxes indicate that turn direction is mandatory and is missing, distance + arc radius are also missing.

Press on "Best data" and data will be calculated and inserted when you press on "validate"

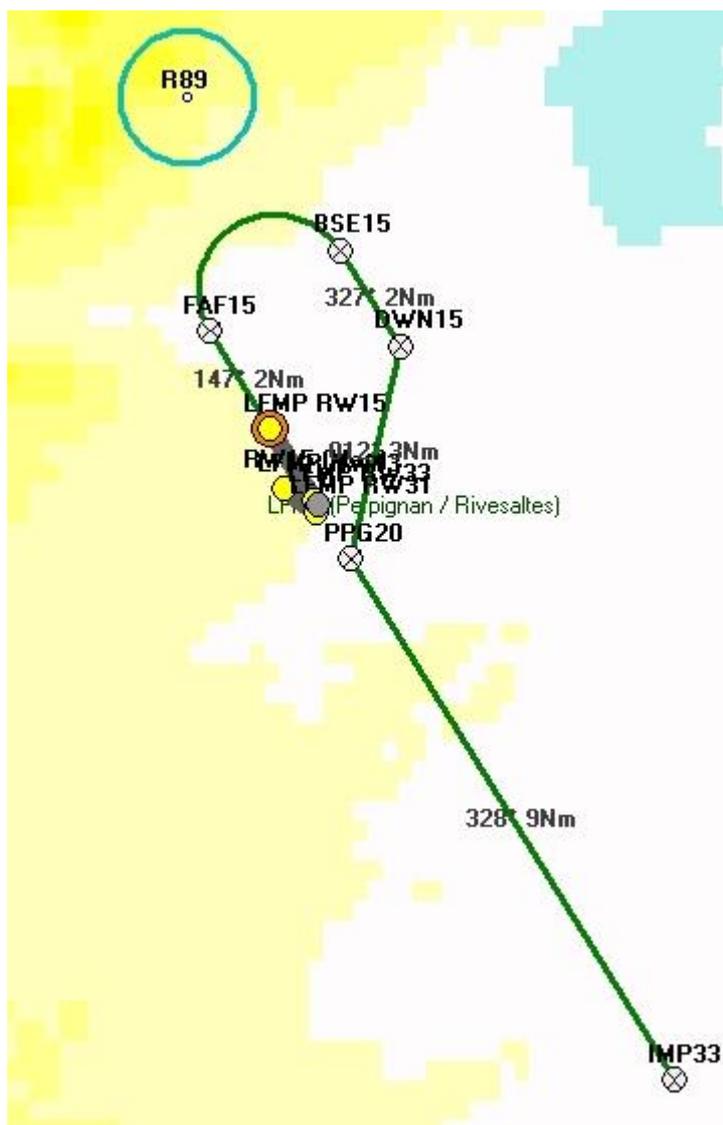
T/D	Hdg	AD	Alt1	Alt2	Ang	RNP	Spd	Distance	CTR-tun	Arc Radius	Rec Nav
L	147.3							3.6	CTRRF	1,153	

ILFPC0E	I	IF	200
ILFPC0E	TF		200
ILFPC0E	TF		2008
ILFPC0E	TF		2008
ILFPC0E	RF		2008
LFPG0GY	M	TF	00180 -300 008

IF	020
TF	
DF	
RF	

IF	060
FAF	
RWY	
CA	
TF	
DF	
RF	

You can save and test it.

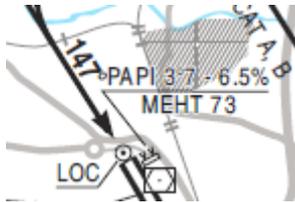


(it's still OK with the PRD zone R89)

Laterally, it's working. Now we have to work on the vertical profile.

Step 7, vertical coding:

We see a glide path constraint in this approach, there's a PAPI and it is at 3.7°



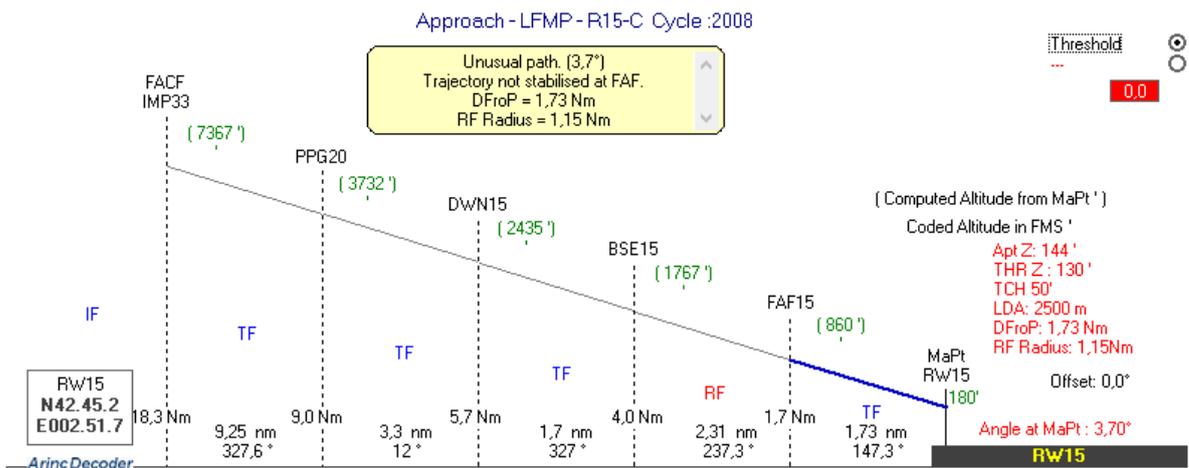
Click on the last segment, in the Angle Box, modify the value by 3.7°

VIA	Row	P/T	Fix	T/D	Hdg	AD	Alt1	Alt2	Ang	RNP	Spd	Distance	CTR-turn	Arc Radius	Rec Nav
	60	TF	RW15	G	Y	M		180	-3.70						

SEURP	LFMPLFFR15-C	C	C	010IMP33LFPC0E	I	IF										2008
SEURP	LFMPLFFR15-C	C	C	020PPG20LFPC0E		TF										2008
SEURP	LFMPLFFR15-C	C	C	030DWN15LFPC0E		TF										2008
SEURP	LFMPLFFR15-C	C	C	040BSE15LFPC0E		TF										2008
SEURP	LFMPLFFR15-C	C	C	050FAF15LFPC0E	L	RF	001153	14730036					CTRRF			2008
SEURP	LFMPLFFR15-C	C	C	060RW15 LFPG0GY	M	TF				00180			-370			2008

Validate and Save.

Make a test...



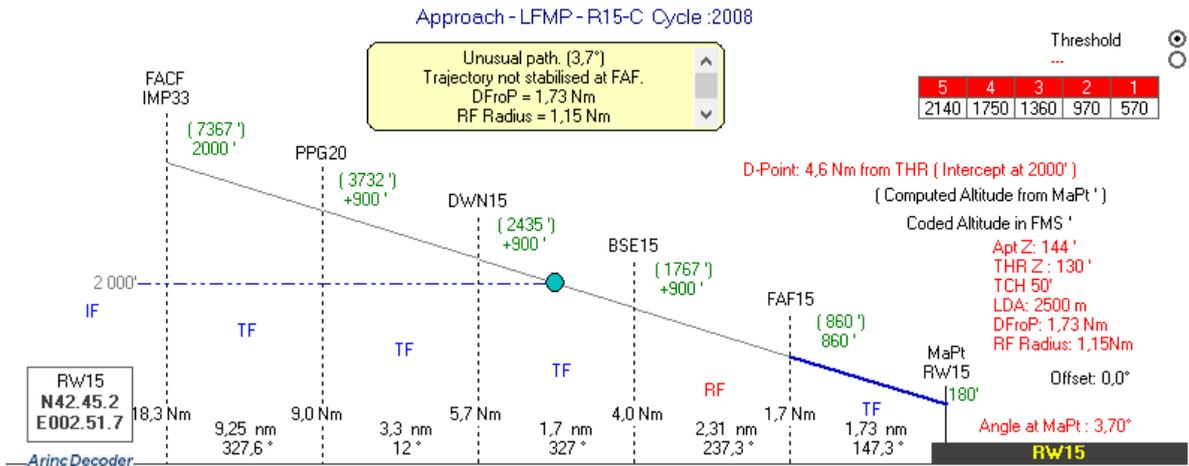
The FAF is now at 860 feet, with the minima at 920 feet, it has good sense.

We can code IMP33 like it is on 33 approach, at 2000'

PPG20 + DWN15 + BSE15 coded 900 or above.

FAF15 at 860'.

And vertical profile can be this one... to be tested in flight simulator...



Mandatory values can be added with each time the best data value.

Approach - LFMP - R15-C										Perpignan / Rivesaltes				Mag Var : 01.0° E (Apt)				
Via	Seq	Pt	Fix	Typ	F/O	Mag	Crs	Alt 1	Alt 2	Vert Angle	RNP	Speed Limit	Distance	Time	CTR Leg	RF Radius (Nm)	Cycle :2008	Update
	10	IF	IMP33	FACF				2000										2008
	20	TF	PPG20			327,3°	+	900					9,2 Nm					2008
	30	TF	DWN15			12°	+	900					3,3 Nm					2008
	40	TF	BSE15			327°	+	900					1,7 Nm					2008
	50	RF	FAF15		L	147,3°		860					3,6 Nm		CTRRF	1,2		2008
	60	TF	RW15	MaPt	FD			180		-3,70°								2008

