

📄 Navigraph versus NavDataPro

By TransaTvia, a website focused on flight simulation.

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Introduction

In a previous statistical statement [1], we found some discrepancies between the content of two navigation databases provided by two different companies dedicated to flight simulation software.

The following results were found. There were 14752 navaids in JEP-1505 (Navigraph-Jeppesen) but 15393 navaids in NDP-1413 (Aerosoft/Lido).

There was a total of 13007 airports in JEP-1505.

There was a total of 9490 airports in NDP-1413.

The difference was 3517 more airports in the Jeppesen set. 4002 airports were in JEP-1505 only. 485 airports were in NDP-1413 only.

9005 airports were shared in common by the two datasets.

```
=====Jeppesen=====
[ 4002 [ 9005 ] 485 ]
=====LIDO=====
```

It seemed that a lot of the 4002 airport exclusive to the Jeppesen dataset were VFR grass strips (therefore the high number of exclusive airports), small airports or somewhat remote civilian airports.

Jeppesen had 6574 airports associated with at least one SID, STAR or APP.

Lido had 6296 airports associated with at least one SID, STAR or APP.

That was 278 more for Jeppesen.

6146 airports are referenced in both datasets. 150 airports were found in the LIDO set only (not present in Jeppesen). 428 airports were found in the Jeppesen set only (not present in LIDO).

```
=====Jeppesen=====
[ 428 [ 6146 ] 150 ]
=====LIDO=====
```

We have also shown in a previous review [2] that RF-legs mandatory to perform RNP AR APCH are only coded in the Navigraph/Jeppesen-sourced dataset.

While not very distant in time, a limitation of this work was that different cycle were compared, 1505 versus 1413, while assimilated to the same date.

The question that rose for this new statement was : how the figures did evolve since this last review ? Therefore in this paper we are making a new statistical review for the cycle 1605 for the same two providers.

Material and Methods :

Dataset were sourced at Aerosoft (Navdatapro product) and Navigraph. Aerosoft sources its data from Lufthansa systems (LHS) while Navigraph uses Jeppesen data base. Without any presumptions of whether the observed differences between the two sets must be rooted either to Aerosoft and Navigraph or rooted to their original source (Jeppesen, LHS), we will call in this paper "NDP-1605" the dataset from Aerosoft/LHS and "JEP-1605" the dataset from Navigraph/Jeppesen.

The original data was parsed by the two companies in various formats adequate for flight simulation. During this step, loss of data can occur during the conversion from the industrial and normalized format to the relaxed flight simulations format.

We only have access to the final product. It was stamped AIRAC 1605.

Using a bash environment in a GNU/Linux operating system we used the following command lines :

```
sed '/;.*$/d' wpNavAID.txt | wc -l
```

to retrieve the number of navaids in each dataset.

```
sed '/;.*$/d' wpNavAPT.txt | wc -l
```

to assess the number of runway ends known in the dataset. As there are typically two runway ends per physical runway, this number of runway ends was then divided by two to obtain the number of runways.

```
sed '/;.*$/d' wpNavFIX.txt | wc -l
```

to retrieve the number of waypoints in each dataset.

```
sed '/;.*$/d' airports.dat | sed -s 's/^\(....\).*\/1/i' | wc -l
```

to get the number of airports.

```
sed '/;.*$/d' airports.dat | sed -s 's/^\(....\).*\/1/i' > lido-airports.liste
sed '/;.*$/d' airports.dat | sed -s 's/^\(....\).*\/1/i' > jeppesen-airports.liste
```

to retrieve the ICAO identifier of airports from each source.

```
diff -y --suppress-common-lines lido-airports.liste ./NDP_PMDG_back/jeppesen-airports.liste | sed '/.*>.*d' | sed '/.*|.*d' | wc -l
```

to retrieve the airports which are in NDP-1605 only

```
diff -y --suppress-common-lines lido-airports.liste ./NDP_PMDG_back/jeppesen-airports.liste | sed '/.*<.*d' | sed '/.*|.*d' | wc -l
```

to gather the airports only in the JEP-1605 dataset.

```
diff -y lido-airports.liste ./NDP_PMDG_back/jeppesen-airports.liste | sed '/.*<.*d' | sed '/.*>.*d' | wc -l
```

to check the number of airports in common.

```
ls -x1 > JEP-ifr
```

and

```
ls -x1 > NDP-ifr
```

to list the airports which have at least on associated IFR procedure. Lists are curated from artefacts related to the "ls" command (not shown).

```
diff -y --suppress-common-lines NDP-ifr ./NDP_PMDG_back/JEP-ifr
```

to check the differences in airports with IFR procedures.

```
diff -y --suppress-common-lines NDP-ifr ./NDP_PMDG_back/JEP-ifr | sed '/.*>.*d' | sed '/.*|.*d' | wc -l
```

to retrieve IFR airports which are in NDP-1605 only

```
diff -y NDP-ifr ./NDP_PMDG_back/JEP-ifr | sed '/.*<.*d' | sed '/.*>.*d' | wc -l
```

to check common airports with IFR proc.

Results

Numerical figures

There are 17 312 nav aids in JEP-1605 (Navigraph-Jeppesen).

There are 18 087 nav aids in NDP-1605 (Aerosoft/Lido).

248 817 Fix in JEP-1605.

256 732 Fix in NDP-1605.

There is a total of 13 193 airports in JEP-1605 for which 16 940 runways are known.

There is a total of 15 680 airports in NDP-1605 for which 13 038 runways are known.

989 airports are in JEP-1605 only.

3476 airports are in NDP-1605 only.

12 204 airports are shared in common by the two datasets.

```
=====Jeppesen=====
[ 989 [ 12204 ] 3476 ]
=====LIDO=====
```

There is a total of 6283 airports with IFR procedures in JEP-1605 and 6902 in NDP-1605.

0 airports are in JEP only. 619 airports are in NDP only. 6283 airports are share in common by the two datasets.

```
=====Jeppesen=====
[ 6283 ] 619 ]
=====LIDO=====
```

Numerical synthesis

```
*****
* * TOTAL AIRPORTS * APT ONLY IN.. * APT SHARED *
*****
* * JEP * NDP * JEP * NDP * *
* * *****
* OLD DATA * 13007 * 9490 * 4002 * 485 * 9005 *
* 1605 DATA * 13193 * 15680 * 989 * 3476 * 12204 *
*****

*****
* * IFR AIRPORTS * IFR APT ONLY IN.. * IFR SHARED *
*****
* * JEP * NDP * JEP * NDP * *
* * *****
* OLD DATA * 6574 * 6296 * 428 * 150 * 6146 *
* 1605 DATA * 6283 * 6902 * 0 * 619 * 6283 *
*****
```

Qualitative analysis

◆ Radius to Fix legs are present only in the Navigraph JEP-1605 data.

Below is a picture taken in the iFly v2.1.0 with JEP-1605 as navigation databank where RF-Legs can be spotted.



RF-legs are accordingly coded in the data set :

```
[R05-Y.05.2]
Leg=RF
Name=MA502
Latitude=32.682806
Longitude=-16.792083
TurnDirection=R
NavDist=1.6
CenterLat=32.659333
CenterLon=-16.764000
```

This can be demonstrated for another set : the NGX



dataset. This picture shows missing RF-legs in NDP-1605.

MA522 and MA520 are incorrectly linked by a track to fix leg.

On the other hand the JEP-1605 provides RF-legs :



A side note : in the iFly datasets, RF legs are coded in a native form while in the NGX dataset, an efficient workaround is to place waypoints along the leg to simulate the RF-legs. In contrast with iFly products, the NGX is indeed not natively able to read RF-legs, so a work around was to support RF-legs with those intermediate waypoints.

◆ Multiple ILS are present only in the Navigraph JEP-1605 data for iFly models (not shown but verified in the iFly procedure file). *A side note : only Navigraph provides a dataset for the iFly 747 v2.1.*

◆ More approaches are available in the JEP-1605 per airports.

For instance, LPMA approaches available in NDP-1605 are :

```
APPROACH RNAVZ05
APPROACH RNAVY05
APPROACH RNAV23
```

In the mean time, LPMA arrivals in JEP-1605 are :

```
APPROACH NDBA05
APPROACH NDBA23
APPROACH NDBB05
APPROACH NDBB23
APPROACH RNV23
APPROACH RNVY05
APPROACH RNVZ05
APPROACH VDMA23
APPROACH VDMB05
APPROACH VDMB23
```

◆ JEP includes GLS approaches but does not list LOC

approaches. NADP does not have GLS approaches but lists LOC approaches on side of ILS ones.

Example for EDDF, JEP-1605 :

APPROACH GLS07CZ

This procedure is not found in NDP-1605.

Example for EDDF, NDP-1605 :

APPROACH LOC25C

This procedure is not found in JEP-1605.

Conclusion

Figures tell that the NavDataPro (NDP) dataset did dramatically evolve with a rising total of airports.

For instance, the airport BIRF Rif Airport (Greenland) was only located in the Navigraph offer (Jeppesen) in the old dataset, but couldn't be found in NavDataPro. In the cycle 1605 BIRF is now among the 12 204 airports that both data sets now share in common (in contrast with the 9005 that their shared in our previous assessment).

The ability to perform RNP AR APCH is still restricted to the Navigraph dataset. It has been reported in various flight simulation aircraft that RF-legs were missing in NavDataPro from Aerosoft, so we can conclude that the parent-parser at Aerosoft does not translate the LHS data when it encounters RF-legs, or RF-legs are not included in the master LHS data that Aerosoft has subscribed for. The fist option seems more likely (*i.e.* Aerosoft parser is less sophisticated than the Navigraph one).

The caveat here is that there is no practical way to compare the data from either dataset with the real world data issued from Jeppesen or Lufthansa Systems.

Bibliography

[1] "Navigraph and NavDataPro raw data", May 2015
[ONLINE] http://ifly.flight1.net/forums/forum_posts.asp?TID=13450&PID=116671𜞿

[2] "Testing the Majestic Software MJC8", October 2015
[ONLINE] <https://www.ssl-url.net/gf3.myriapyle.net/aero/Fichiers/RNP.pdf>

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