

ARINC 424 NDB

**Draft 1 of Supplement 24
Discussion**

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SHOULD AIRCRAFT CATEGORY BE A KEYFIELD OR NOT

V 2

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SUMMARY

During the last meeting, a discussion started in regards to the aircraft category/type field (5.301). This paper collects the data fields and provides examples to discuss how to proceed.

1.0 INTRODUCTION/ BACK GROUND

During the last 424 meetings, there were several proposals towards better defining what makes a procedure or transition unique, and specifically, during the last meeting, the proposal to remove a naming convention rule to allow to uniquely identify the “same” transition having different tracks depending on the aircraft category, which was introduced before the aircraft category field was added in 424, was not accepted.

I believe that all users of ARINC 424 would benefit if the aircraft category/type field would be considered a key field. First, I would like to summarize the indications found in 424 that the field was intended and recognized to be a key field. Second, I would like to present state source examples that may provide the rational for the benefit having the field as a key field.

Indications in ARINC 424 that the Aircraft Category is intended to be a key field

In the Navigation Data Base (NDB) Subcommittee May 25-28, 2010, in Toulouse, France Meeting Report, the following text is included in attachment 9:

Joint Jeppesen/Honeywell Proposal

Current SID/STAR/Approach Coding does not cater to the fact that some procedures are not valid for all aircraft categories (approach) or all aircraft types (jet versus turboprop) for SIDs and STARs. There is an unused column in the S/S/A Record, column 26, that is within the “key” area of the record. This column could be used to provide this piece of missing information:

Content	Used On	Description
A	PF	Category A aircraft only
B	PF	Category B aircraft only
C	PF	Category C aircraft only
D	PF	Category D aircraft only
E	PF	Category E aircraft only
H	PF	Helicopter Only
L	PF	A and B
M	PF	C and D
N	PF	A, B and C
J	PD, PE	Jet Aircraft Only
P	PD, PE	

In ARINC 424-20, this field was originally inserted in the mentioned column, in the “key” area in front of the continuation record number, without any note specifying that it is not considered a key field, or that it should be excluded from the sorting.

On the other hand, columns 119 and 120, which are outside the key area, are explicitly spelled out to be included in the sorting order, because there could be more than one path per transition per qualifier.

Another hint that the Aircraft Category field was intended to be a key field was its inclusion in column 117 in the PK records. This was done in 424-21 (draft 2). The correct TAA sector could be found uniquely without this added field if the aircraft category field on the approach record would not be considered key and if the transition identifier would ensure uniqueness.

One more information is rule 2.11.5 in attachment 5, which very clearly specifies that the final approach coding and missed approach may not be repeated for different categories. However, no such statement that the approach transitions may not be repeated or require a unique transition identifier. Also, no such statement is given for SIDs or STARs.

As a summary, ARINC 424 allows to have multiple paths per approach transition for different aircraft categories, while still being able to uniquely identify all related data. The same is true for SIDs and STARs.

Source examples

SID in CYXT, from Runway 33, having different tracks per category:

■ ■CYXT-DPTERRACE, BC
CYXT

Departure Procedure

Rwy 15 – ½: Requires a minimum climb gradient of **460** ft/NM to **3800**. Climb INBD track **161°** to “XT” NDB. Then continue climb INBD track **170°** to “ZKI” NDB. Shuttle INBD track **327°** (LEFT turn) to MEA BPOC.

or

SPEC VIS – Climb in visual conditions to cross the airport at or above **2800**. Continue climb INBD track **163°** to “XT” NDB. Then continue climb INBD track **170°** to “ZKI” NDB. Shuttle INBD track **327°** (LEFT turn) to MEA BPOC.

Rwy 33 – ½: Departure not auth when CYA168 active (OCSL by NOTAM)

Restricted to **Cat A & B** acft only. Requires a minimum climb gradient of **460** ft/NM to **5400**. Climbing LEFT turn, intercept INBD track **141°** to “XT” NDB. Then climbing RIGHT turn INBD track **170°** to “ZKI” NDB. Shuttle INBD track **327°** (LEFT turn) to MEA BPOC.

Restricted to **Cat C & D** acft only. Requires a minimum climb gradient of **700** ft/NM to **8800**. Climbing LEFT turn, intercept INBD track **120°** to “XT” NDB. Then climbing RIGHT turn INBD track **170°** to “ZKI” NDB. Shuttle INBD track **327°** (LEFT turn) to MEA BPOC.

Example in EDDS, SID having a different description for CAT A vs. CAT B/C/D

Designator	Route
1	2
ABTAL 4B	ABTAL FOUR BRAVO On R252 STG to 5.9 DME STG; LT, on track 164°; when crossing R231 STG LT (MAX IAS 125 KT until established on track 084°; CAT B, C, D: replace track 164° by continuous LT with MAX IAS 230 KT); on track 084° to TEDGO (Δ); LT, on track 065° to ABTAL (Δ). Climb with 4 % (245 ft/NM) or more until passing 1900, climb with 5.1 % (310 ft/NM) or more until passing 4000. GPS/FMS RNAV: [A1700+] - DS046[L] - DS047 (CAT A) - DS052 (CAT A)[L] - DS048 (CAT A)[K125-] / (CAT B,C,D)[K230-] - TEDGO[L] - ABTAL.

KBOS, Departure having different instructions between Jet and Prop:

(LOGAN3.BOS) 21280 GENERAL EDWARD LAWRENCE LOGAN INTL (BOS)
LOGAN THREE DEPARTURE AL-58 (FAA) BOSTON, MASSACHUSETTS

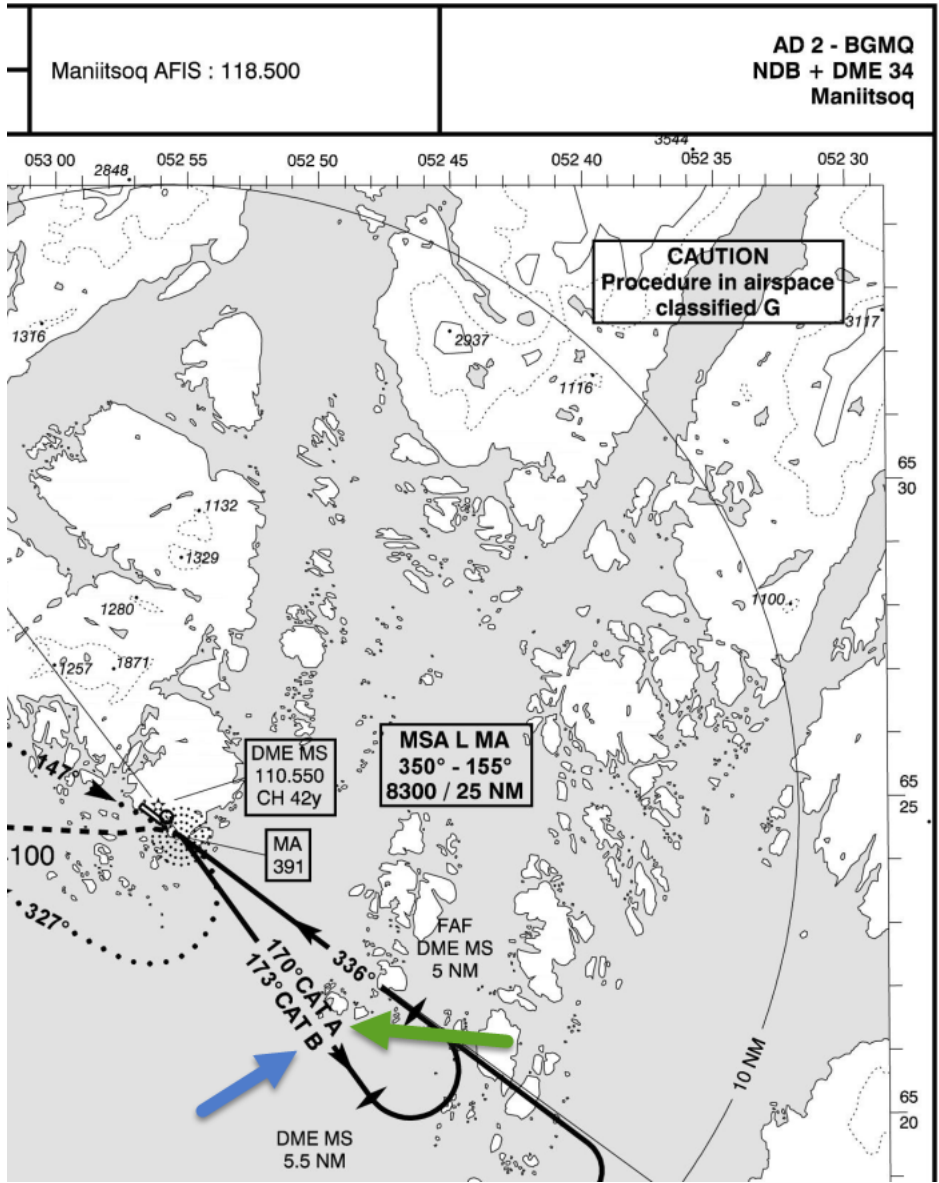
DEPARTURE ROUTE DESCRIPTION

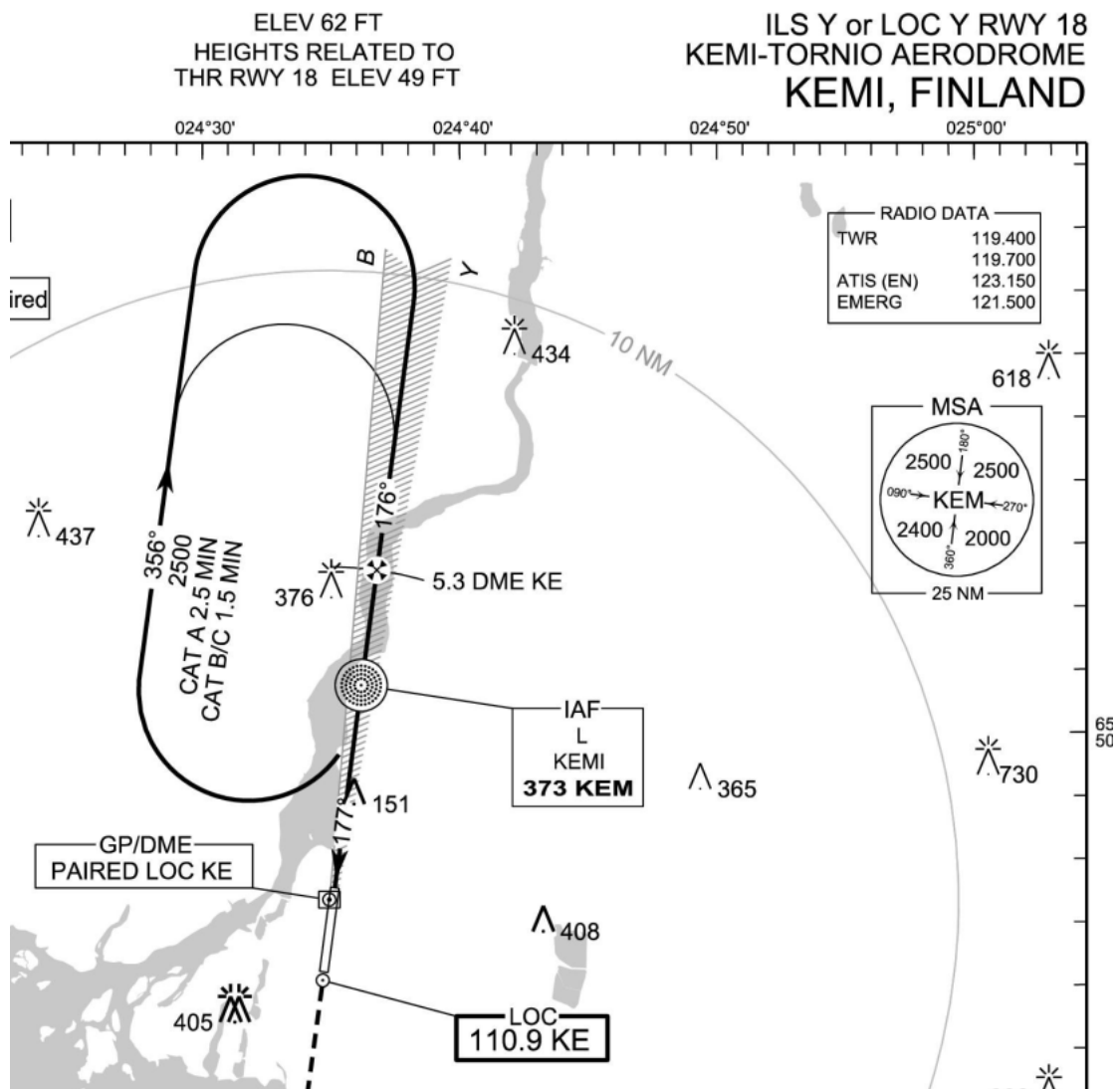
JET AIRCRAFT:
TAKEOFF RUNWAYS 4L/4R: Climb on heading 035° to BOS 4 DME, then right turn heading 090°, thence....
TAKEOFF RUNWAY 9: Climb on heading 092°, thence....
TAKEOFF RUNWAY 14: Climb on heading 141° to BOS 1 DME, then left turn heading 120°, thence....
TAKEOFF RUNWAY 15R: Climb on heading 150° to BOS 1 DME, then left turn heading 120°, thence....
TAKEOFF RUNWAYS 22L/22R: Climbing left turn heading 140°, thence....
TAKEOFF RUNWAY 27: Climb on heading 272° to BOS 2.2 DME, then left turn heading 235°, thence....
TAKEOFF RUNWAY 33L: Climb on heading 330° to BOS 2 DME, then left turn heading 316°, thence....

NON JET AIRCRAFT: Climb on assigned heading, thence....

....expect RADAR vectors to assigned route/navaid/fix. Jet aircraft maintain 5000 or lower assigned altitude. Non jet aircraft maintain 3000 or lower assigned altitude. Expect clearance to filed altitude/flight level within ten (10) minutes after departure.

Example of approach transitions where the current rule with naming “AB” and “CD” is not sufficient:





And an example of different speed restrictions in the missed approach. Example in BIAR, RNP Y RWY 19

MISSED APPROACH:

Climb on course 185° to AR495 (CAT A-B max IAS 150 KT, CAT C-D max IAS 185 KT) turn right to AR49 to NB, to AR594, on course 211° until passing 6000 FT, turn left to NB and hold at 7000 FT.

2.0 DISCUSSION and or ACTION

I believe we should allow and clarify that in ARINC 424, the aircraft category/type (5.301) field is intended to be a key field, and that it should be allowed in final and missed approaches as well.

I would ask the group to review the statements above and the examples, discuss, and decide if the field should be treated as key or not. In either case, some clarifications or changes to 424 should be made.