

# **ARINC 424 NDB**

**Draft 1 of Supplement 24  
Discussion**

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## **AF LEG BASED ON NON-COLLOCATED NAVAIDS**

**V1.0**

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<b>SUMMARY</b>
Discuss if there are any additional information that needs to be added to support the AF leg recommended navaid changes that were made in the ARINC Specification 424-23

## 1.0 INTRODUCTION/ BACK GROUND

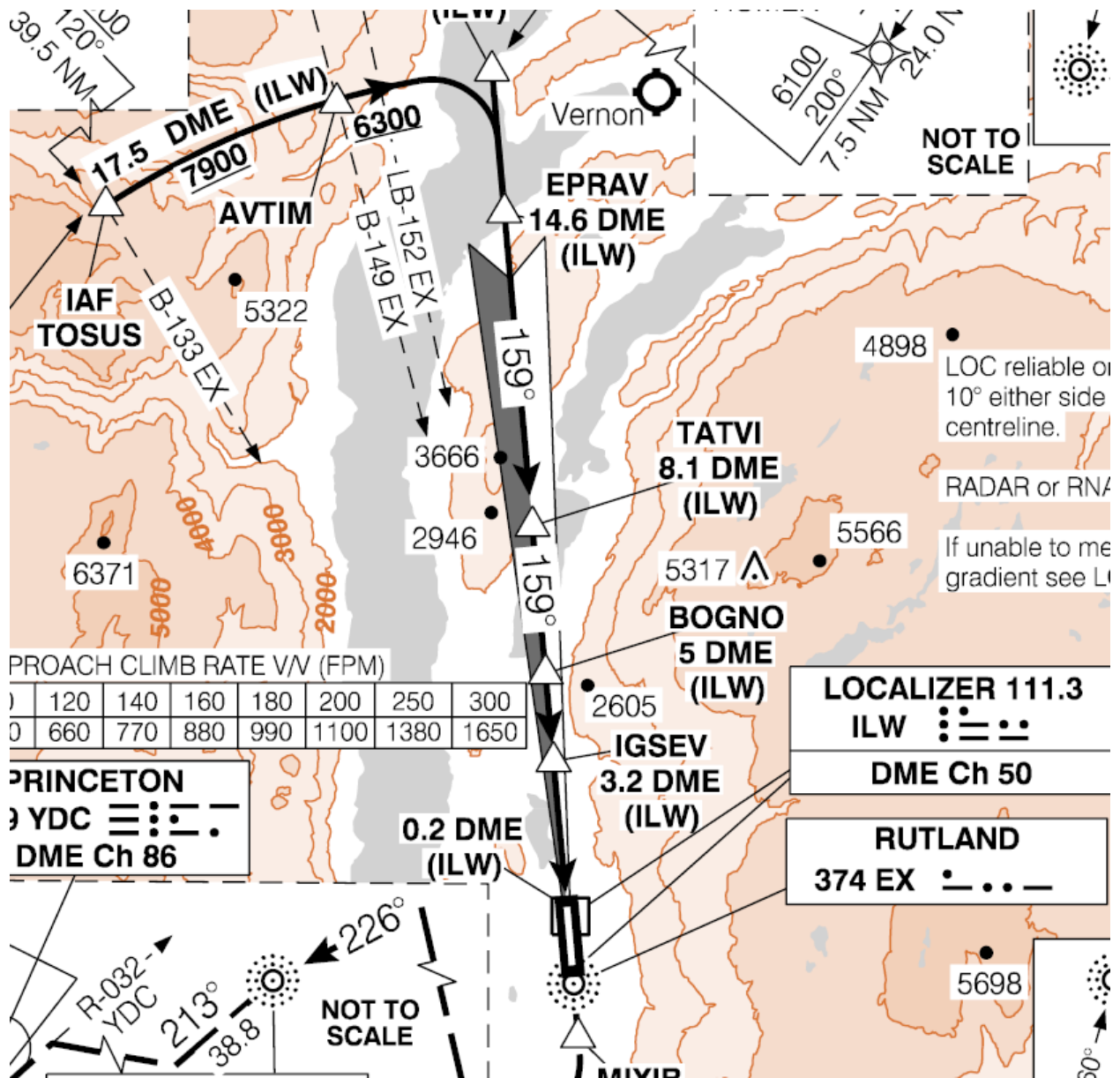
In the ARINC Specification 424-23, the recommended navaid table in Chapter 5, section 5.23 was updated to allow for additional facility types for AF legs. This presents a few questions with regards to AF leg implementation of the changes, when the type of navaid used as the rec nav cannot define the boundary or fix radial information.

**Table 5-18 – Recommended Navaid Usage Part 1**

Facility Type	Procedure User															
	SID/STAR	Approach Transition	Missed Approach Procedure	Path Terminator - AF	Path Terminator - CR, VR	Path Terminator - CD, VD, FD	Localizer Final Approach & Transitions of Course or Heading to Intercept Localizer	VORDME/VORTAC Final Approach	VOR Only Final Approach Coding	NDB Only Final Approach Coding	NDB + DME Final Approach Coding	TACAN Final A approach Coding	GLS Final A approach Coding	MLS Final Approach Coding & Transitions of Course or Heading to Intercept MLS	Airports	Airways
Collocated VORDME/VORTAC	X	X	X	X	X	X		X			2				X	X
Non-collocated VORDME/VORTAC		X	X	X				X			2				X	X
Localizer		X	X		X		X									
VOR		X	X		X				X						X	X
DME			X	X		X					2					
TACAN	X	X	X	X	X	X					2	X			X	X
NDB		X	X						X	1						X
ILSDME or ILSTACAN			3	X		3					2 & 3					
GLS		X										X				
MLS		X											X			

## 2.0 DISCUSSION and or ACTION

The following procedure is an example where the AF leg is defined as an arc from a ILS DME. The procedure is the CYLW LOC Y RWY 16. The NDB and IDME are 1.39nm apart.



In the above procedure, the source provided bearings of 133 and 149 are to the EX NDB and not referenced to the ILW DME.

Here are a few questions that I would like to get feedback from the subcommittee on.

1. If the navaid providing the bearing information for the AF leg in the source document is not collocated with the DME source for the AF leg, is it expected that the data supplier will recalculate the bearings from the DME source, to include in the Mag Crs and Theta fields?
  - a. For example, in the above procedure, would the bearings from the NDB get replace by bearings from the ILW DME to the TOSUS and AVTIM fixes respectively. The Mag Crs would be 311 and the Theta would be 328 (using airport mag var).
2. Are the Mag Crs and Theta fields actually used for AF legs? Or is the system just intercepting the arc?
3. What Mag Var should the data houses use for DME recommended navaids.

4. If there is no station declination for a VHF navaid record or Tacan only record, the only other variation that is delivered is the Mag Var in the Simulation records, which contains a dynamic mag var.

The following is a suggested addition to the attachment 5 AF leg coding rules that I thought might be a needed reference since the source bearings could be getting replaced by a derived value:

### 3.4 Rules specific to arc legs, leg type AF:

**3.4.1** When an AF-AF leg sequence is coded, both legs must use the same Recommended VHF Navaid facility and the DME distance must be the same for both legs.

**3.4.2** When any holding leg (HX) or fix termination (XF) is followed by an AF leg, the preceding termination fix must lie on the arc defined in the AF leg.

**3.4.3** When a FD leg is followed by an AF leg type, the fix in the FD leg must have the same Recommended VHF Navaid as that defining the AF leg.

**3.4.4** When a CD or VD leg type is followed by an AF leg type, both legs must have the same Recommended VHF Navaid. The DME distance must be the same for both legs.

**3.4.5** When a CI leg type is followed by an AF leg type, the course to must be to the Recommended VHF Navaid which defines the AF arc.

**3.4.6 When an AF leg is based on a DME or IDME, and the Boundary Radial and Fix Radial are originating from a different non-collocated navaid, the Radials must be derived from the DME or IDME to correspond with the procedure source intent.**