ARINC 424 NDB

Draft 4 of Supplement 23
Proposal

Location: Virtual Meeting
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ADD HOLDING PATTERN INBOUND COURSE NAVAID & THETA

V.0

Joshua Fenwick, Garmin – AVDB Team

GARMIN AVIATION DATABASE TEAM

SUMMARY
Garmin is proposing to add the Inbound Course Navaid and Theta values to the Holding Pattern (EP) record.

1.0   INTRODUCTION/ BACKGROUND

The current Enroute Holding Pattern (EP) record does not indicate what makes up the inbound course of the holding pattern. Garmin would like to receive the recommended navaid & theta (radial/bearing) which was used to define the inbound course so that we could correctly adjust for the magnetic variation of the holds, and potentially auto-tune the navaid when that holding pattern is flown.

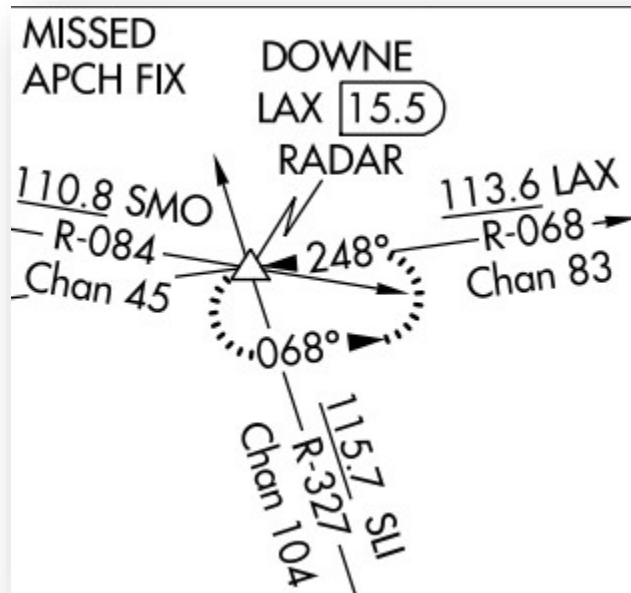Below is an example of the DOWNE INT on the KLAX ILS or LOC RWY 7L which has 3 fix makeups.

Figure 1: KLAX I07L

And looking at the FAA's 8260-2 form the DOWNE INT has three holds each with a different inbound course makeup: LAX VORTAC R-068, WP (RNAV), SLI VORTAC R-327.

Figure 2: KSEA CHINS4 Arrival

2.0 DISCUSSION and/or ACTION

Garmin proposes to add the fields to the Enroute Holding Pattern (EP) record for the inbound course's Navaid and theta (radial/bearing).

3.0 Legacy ARINC 424 changes as depicted (Track Changes is Helpful)

   3.1 Update Chapter 4, Table 4.1.5.1:

       3.1.1   Add Inbound Course Navaid Identifier

       3.1.2   Add Inbound Course Navaid ICAO

       3.1.3   Add Inbound Course Section Code

       3.1.4   Add Inbound Course Subsection Code

       3.1.5   Add Inbound Course Navaid Airport ICAO Identifier

       3.1.6   Add Inbound Course Navaid Airport ICAO Code

       3.1.7   Add Inbound Course Theta

4.1.5.1 Holding Pattern Primary Records

Column	Field Name (Length)	Reference
…		
81	Leg Inbound/Outbound Indicator (1)	5.298
82 thru ~~98~~85	~~Reserved (Expansion) (17)~~**Inbound Course Navaid Identifier**	**5.###**
86 thru 87	**Inbound Course Navaid ICAO**	**5.14**
88	**Inbound Course Section Code**	**5.4**
89	**Inbound Course Subsection Code**	**5.5**
90 thru 93	**Inbound Course Navaid Arpt ICAO Ident**	**5.6**
94 thru 95	**Inbound Course Navaid Arpt ICAO Code**	**5.14**
96 thru 98	**Inbound Course Theta**	**5.###**
99 thru 123	Name (25)	5.60
124 thru 128	File Record No. (5)	5.31
129 thru 132	Cycle Date (4)	5.32

   3.2 Update Chapter 5, Field Definitions: Add new field definition for Inbound Course Navaid

5.### Inbound Course Navaid

Definition/Description: The Inbound Course Navaid indicates the inbound course Navaid which is used when navigating on the holding pattern's Inbound Holding Course (5.62).

Source/Content: The Inbound Course Navaid is derived from official government source when available. The 1-character through 4-character identification of the Navaid appears in this field.

Used On: Enroute Holding Pattern
Length: 4 characters
Character Type: Alpha/Numeric
Examples: JLF, ISTL, *blank*

3.3 Update Chapter 5, Field Definitions: Add new field definition for Inbound Course Theta

5.### Inbound Course Theta

Definition/Description: The Inbound Course Theta indicates the magnetic radial/bearing from the inbound course Navaid which is used when navigating on the holding pattern's Inbound Holding Course (5.62).

Source/Content: The Inbound Course Theta is derived from official government source when available. The values are provided with a resolution of one degree with a range of 001 through 360. The value of blank will be provided when the Inbound Course Theta is not available / not applicable.

Used On: Enroute Holding Pattern
Length: 3 characters
Character Type: Alpha/Numeric
Examples: 001, 123, 360, *blank*

NOTE: Do not include examples below in the ARINC 424 Specification

Examples of the DOWNE example with the LAX VORTAC R-068 and DOVES example of the I-OWB 359° course:

Column	Field Name (Length)	Example 1	Example 2
…			
82 thru 85	Inbound Course Navaid Identifier	LAX	IOWB
86 thru 87	Inbound Course Navaid ICAO	K2	K5
88	Inbound Course Section Code	D	P
89	Inbound Course Subsection Code		I
90 thru 93	Inbound Course Navaid Arpt ICAO Ident		KOWB
94 thru 95	Inbound Course Navaid Arpt ICAO Code		K5
96 thru 98	Inbound Course Theta	068	359
…			

4.0 XML ARINC 424 changes as depicted (Track Changes is Helpful)

- Jira Ticket: ARINC-271

- Git Feature Branch: feature/ARINC-271-add-holding-pattern-inbound-course-navaid-theta

- Summary of changes:

4.1 Update HoldingPattern.xsd:

    4.1.1   Add element "inboundCourseNavaid" as PointReference

    4.1.2   Add element "inboundCourseTheta" as unsignedInt

```
86        </xs:element>
87 +      <xs:element name="inboundCourseNavaid" type="type:PointReference" minOccurs="0" maxOccurs="1">
88 +          <xs:annotation>
89 +              <xs:documentation>The "Inbound Course Navaid" field indicates the inbound course Navaid whi
90 +          </xs:annotation>
91 +      </xs:element>
92 +      <xs:element name="inboundCourseTheta" type="xs:unsignedInt" minOccurs="0" maxOccurs="1">
93 +          <xs:annotation>
94 +              <xs:documentation>The "Inbound Course Theta" field indicates the magnetic radial/bearing fr
95 +          </xs:annotation>
96 +      </xs:element>
97    </xs:sequence>
```

Figure 3: XML Changes to HoldingPattern.xsd