

Electronic Coding/Packing Process of RNAV Approach Procedures for Flight Inspection

Presented to: IFIS 2008

By: Dan Burdette, Airspace System Inspection Pilot

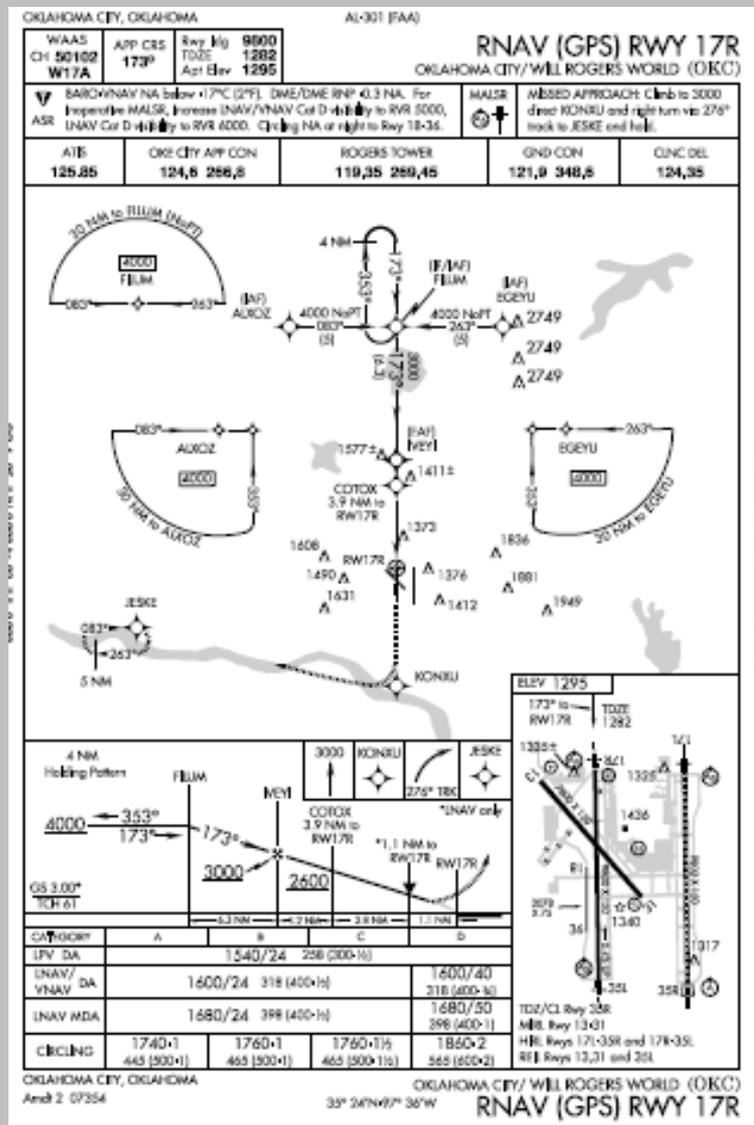
Date: June 23-27, 2008



Federal Aviation
Administration



Typical RNAV Approach Procedure



ARINC 424 Coding-Flight Inspection Summary

ARINC FLIGHT INSPECTION SUMMARY - VERSION 424-18

ROUTES	TRANSITION	FIX	SEQ	USE	PATH	TURN	FO/FB	RNP	MAG (TRUE)	DISTANCE	ALTITUDE
	HUPLO	HUPLO	010	IAF	IF		FB				
	HUPLO	ZULOT	020		TF		FB	1.0	264.7 (270T)	005.0	02700
	JERAG	JERAG	010	IAF	IF		FB				
	JERAG	ZULOT	020		TF		FB	1.0	084.6 (090T)	005.0	02700
	ZULOT	ZULOT	010		HF	R	FB		354.6 (360T)	004.0	02700
		ZULOT	010	FACF	IF		FB				02700
		WURTO	020	FAF	TF		FB	0.5	354.6 (360T)	007.1	02300
		RW35	030	MAP	TF		FO	0.3	354.6 (360T)	003.9	01051

MISSED APPROACH	FIX	SEQ	USE	PATH	TURN	FO/FB	RNP	MAG (TRUE)	DISTANCE	ALTITUDE
	TOMHO	040		DF		FO	1.0			02800
	TOMHO	050		HM	R	FO	2.0	174.6 (180T)	004.0	02800

POINT DATA	WAYPOINT	LAT IN SECS	LONG IN SECS	LAT IN MINS	LONG IN MINS
	ZULOT	N363217.68	W0970553.64	N3632.295	W09705.894
	HUPLO	N363219.46	W0965941.37	N3632.324	W09659.690
	JERAG	N363215.58	W0971205.90	N3632.260	W09712.098
	WURTO	N363926.24	W0970557.06	N3639.437	W09705.951
	TOMHO	N365545.59	W0970604.93	N3655.760	W09706.082
	RW35	N364319.44	W0970558.93	N3643.324	W09705.982

RUNWAY DATA	RWY	THRESHOLD ELEVATION	TCH
	RW35	01006	45



Flight Inspection of RNAV Approaches (Commissioning and Amendments)

- **Averaging over 65 RNAVs per Month**
- **Aircraft has to be Available and Avionics Powered**
- **≈ 20 Minutes for Manual Entry of Each Approach**



The “GOLD STANDARD” Navigation Data Base

A Process of Automation for:

- **Developing a Flight Procedure,**
- **Validating the Flight Procedure,**
- **ARINC 424 Coding the Procedure,**
- **Electronically Packing the Coded Procedure into a Navigation Data Base**
- **Flight Inspect/Validate using the Navigation Data Base**
- **Release to Commercial Data Base Suppliers**



Instrument Flight Procedures Software Program (IFP)

- **When flight procedure development is completed, the data is entered into a software program called Instrument Flight Procedures Program (IFP).**
- **The IFP Documents and Validates the Information.**
- **Validation includes ARINC 424 Specification, TERPS Criteria, and Obstacle Data.**
- **ARINC 424 Codes Procedure for Flight Inspection**



Itinerary Search Results

Full Itinerary	Coords Only	Start Date	FIFO	Service Area	PIC	Tech	Tail Num.	Data	ARINC
051908A83CFRDFL	051908A83CFRDFL	05/19/08	ATL		CRAWFORD, J / VN238	FRANKOWSKI, W / VN057	N83		PACK
0519B76F1	0519B76F1	05/19/08	BTL	CNTL	HARING, J / VN071	UZZLE, R / VN260	N76		PACK
0519N98North	0519N98North	05/19/08	OKC		FORMAN, C / VN248	CARRIZOSA, R / VN024	N98		PACK
0519S57SOUTH	0519S57SOUTH	05/19/08	SAC	WEST	GANO, T / VN061	ELLIOTT, B / VN047	N57		PACK
0519S84EAST	0519S84EAST	05/19/08	SAC	WEST	MOLOKIE, T / VN235	JOHNSON, J / VN087	N84		
0519Y81MIDS	0519Y81MIDS	05/19/08	ACY	EAST	GOTTWALD, C / VN066	MACCLEMMY, B / VN106	N81		
052008A70CPRATL	052008A70CPRATL	05/19/08	ATL		COOPER, R / VN229	RICE, C / VN142	N75		
0520N79DAL	0520N79DAL	05/19/08	OKC		CAUDLE, J / VN026	SUMMERHILL, E / VN164	N79		PACK
HELO 051908		05/19/08	ATL		REINEBOLD JR., J / VN141		NA		
0519N78TXNM	0519N78TXNM	05/20/08	OKC		DRAPER, C / VN046	MCLEOD, K / VN119	N78		
052008A67GAMS	052008A67GAMS	05/20/08	ATL		JEFFERS, J / VN086	THOMAS, I / VN166	N67		PACK
0520B58L4	0520B58L4	05/20/08	BTL	CNTL	RANDALL, J / VN139	BECK, R / VN230	N58		PACK
0520N80F4	0520N80F4	05/20/08	BTL	CNTL	HUSTAK, M / VN082	CLARE, D / VN028	N80		
0520Y73WE	0520Y73WE	05/20/08	ACY	EAST	MALCUN, J / VN109	MAY, R / VN114	N73		
052108N56AHRNRNV		05/20/08	OKC		AHERN, M / VN002	JONES, T / VN088	N56		PACK
0520Y72NE	0520Y72NE	05/21/08	ACY	EAST	SCHLEIFER, J / VN231		N72		
0522N74MO	0522N74MO	05/21/08	OKC		STUCKERT, R / VN163	MILLER, M / VN121	N74		



Flight Inspection Pull

Check the procedures you want packed:

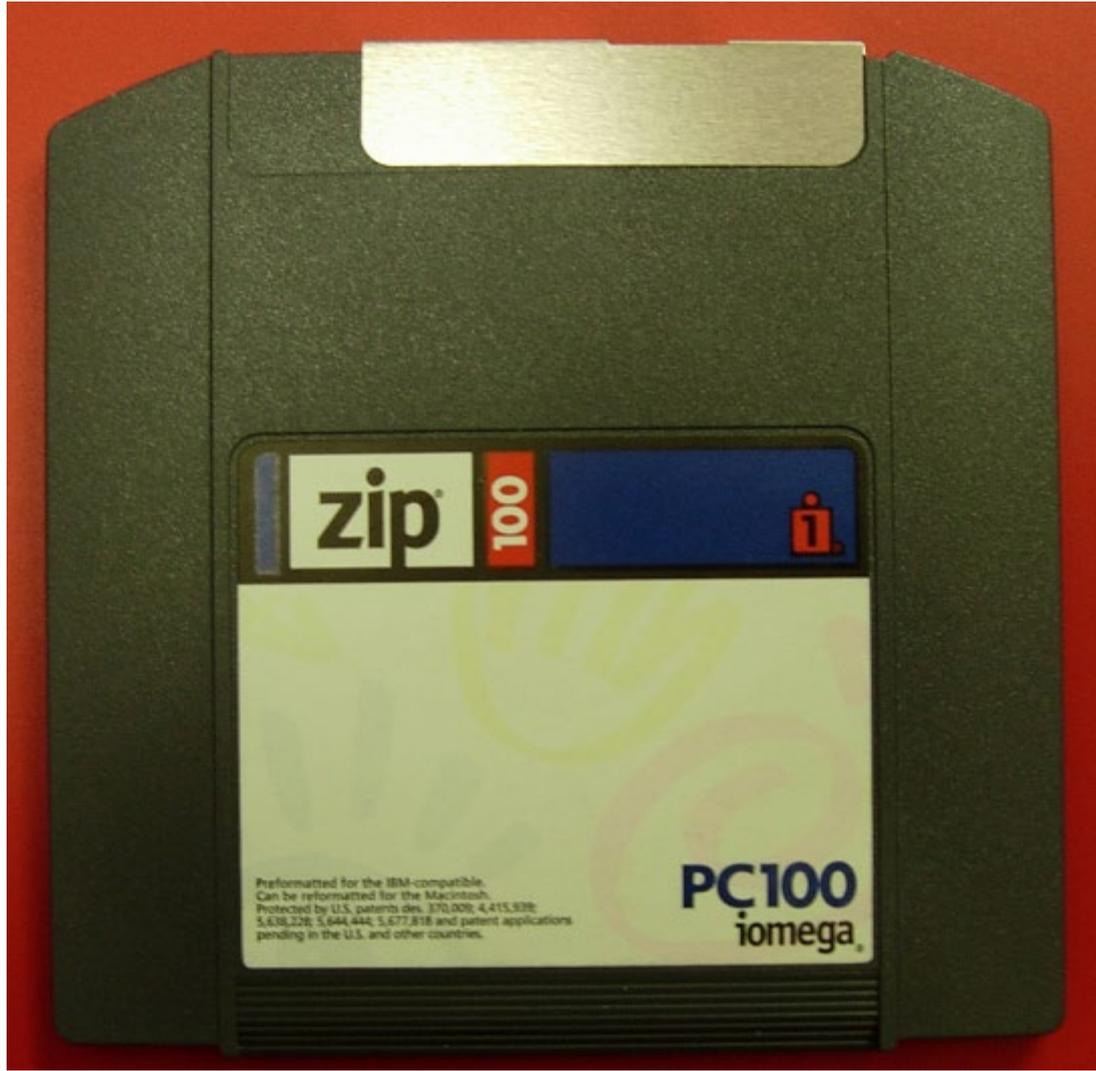
	Procedure	Number	Amendment	Airport	Channel Type	Owner	Status
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 3	22378	1.00	KPKB	WAAS	PUBLIC	PENDING
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 27	22160	0.00	KPLD		PUBLIC	PENDING
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 14	20309	0.00	KHMZ		PUBLIC	PENDING
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 32	20310	0.00	KHMZ		PUBLIC	PENDING
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 25	22686	0.00	KIOW	WAAS	PUBLIC	PENDING
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 26	22588	0.00	KN47		PUBLIC	PENDING
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 4R	3544	2.00	KMDW	WAAS	PUBLIC	PENDING
<input checked="" type="checkbox"/>	RNAV (GPS) RWY 26	6130	1.00	KLNS		PUBLIC	PENDING

These procedures cannot be packed:

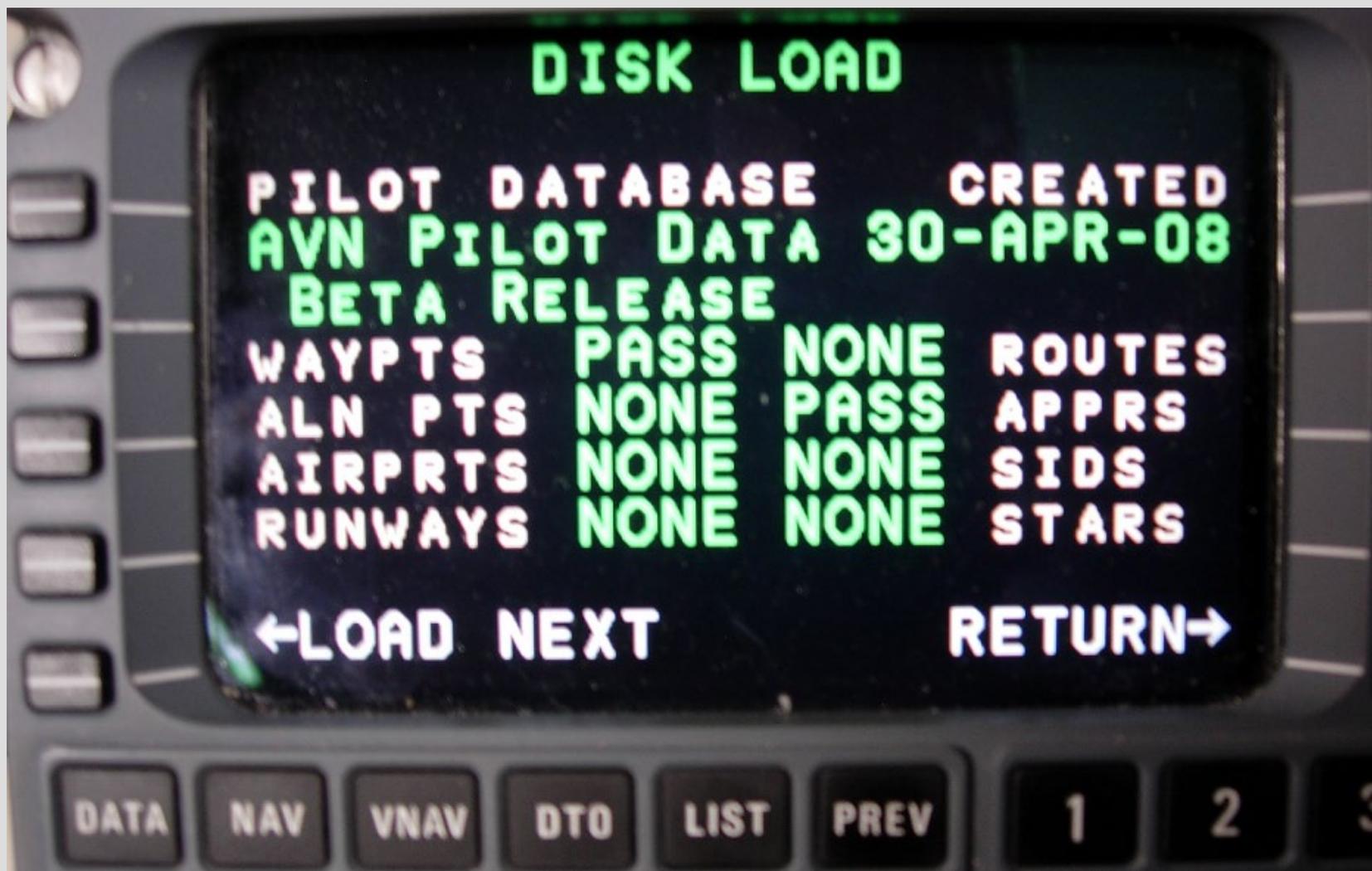
	Procedure	Number	Amendment	Airport	Channel Type	Owner	Status
	LOC BC RWY 23	12795	19.00	KHUF		PUBLIC	PENDING
	ILS OR LOC RWY 36	16009	5.00	KTYQ		PUBLIC	PENDING



Disk Media for Transferring Data Base



FMS Screen After Loading Approaches



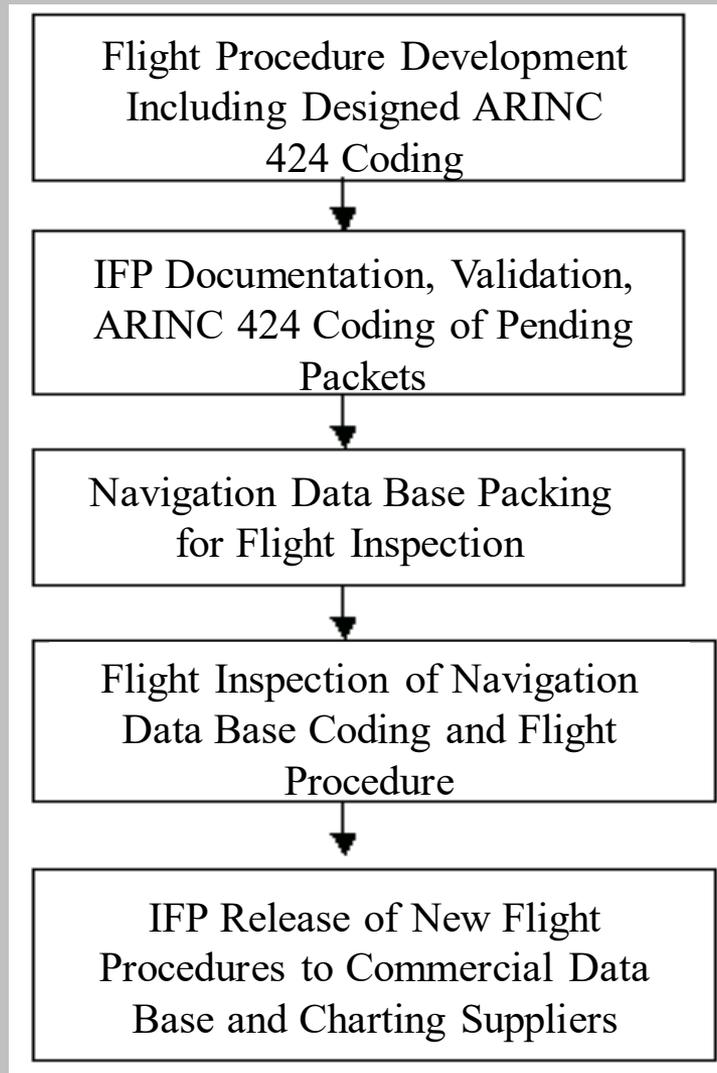
Selection of Approach from FMS Data Base



Time Savings

- **Access Flight Inspection the Internet Site**
- **Pack and Download ARINC 424 Coded Procedures for Itinerary**
- **Upload into the Aircraft's Flight Management System**
- **Time Required is less than 5 Minutes**





What is in the Future for Flight Inspection of the “Gold Standard” Data Base?

- **Via Web Server, Send Official Source ARINC 424 Data to FMS Navigation Data Base Packer**
- **Populate the Flight Inspection FMS Navigation Data Base Cycle with the New ARINC 424 Coded Procedure Data**
- **Retain Private Procedures in Navigation Data Base**
- **Update Flight Inspection Navigation Data Every 28 Days**



First Public RNAV (RNP) Procedure in United States

