Flight Procedure Tracking Form	Action: FLIGHT CHECK	Task Type: SID	Date Open: 10/05/2011	Task #: 2011100529630801004	Request #: 20111005296308
Procedure: SID LWOOD (RNAV) ONE RALEIGH-DURHAM NC KRDU		Airport ID: KRDU	Airport: RALEIGH-DURHAM INTL		Reimbursable #:
City: RALEIGH/DURHAM	ST: NC	GPS #:		Estimated Chart Date: 01/10/2013	FICO #:
Fac ID:	Fac. Type: Proc D	Specialist: DAVID SAUER			

Procedure Review

	Rec'd	Rel'd	Full Name	Comments
Lead:	07/03/2012	08/29/2012	MARLON ROBINSON	
QA:	08/29/2012	09/05/2012	STEVEN SZUKALA	
Liaison:	09/05/2012		Spurlin	DME/DME

P3

DME / DME

ESV REQUEST INCLUDED

Procedure Comments: ENROUTE

Remark Type: INFORMATION

pg 4.17

RALEIGH/DURHAM, NC RALEIGH-DURHAM INTL (KRDU) LWOOD ONE (RNAV) (SID) ENROUTE-YES FC: 11.13.12 PUB: 1.10.13

ATTACHED FORMS: 8260-15B; 8260-15C; 8260-2(S): EPOCH, ORIG; FOCAL, ORIG; LWOOD, ORIG; OPUSS, ORIG; ROANOKE (ROA) VTAC, REV 11; (INFO ONLY) PULASKI (PSK) VTAC, REV 18.

CONTACT: DON SMITH/MARLON ROBINSON-AJV-352 LEADS, 405.954.1036 / 405.954.3636.

LWOOD ONE DEPARTURE (RNAV)

RALEIGH-DURHAM INTL (RDU)
RALEIGH-DURHAM, NORTH CAROLINA

ATIS 123.8
CLNC DEL 120.1
GND CON
(EAST) 121.9 348.6
(WEST) 121.7 348.6
RALEIGH TOWER
(EAST) 127.45 257.8
(WEST) 119.3 257.8
RALEIGH DEP CON
132.35 256.9

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RWY 5L, 5R: Climb heading 052° or as assigned by ATC, expect radar vectors to FOCAL, then on depicted route to LWOOD, thence . . . .

TAKEOFF RWY 23L, 23R: Climb heading 232° or as assigned by ATC, expect radar vectors to FOCAL then on depicted route to LWOOD, thence . . . .

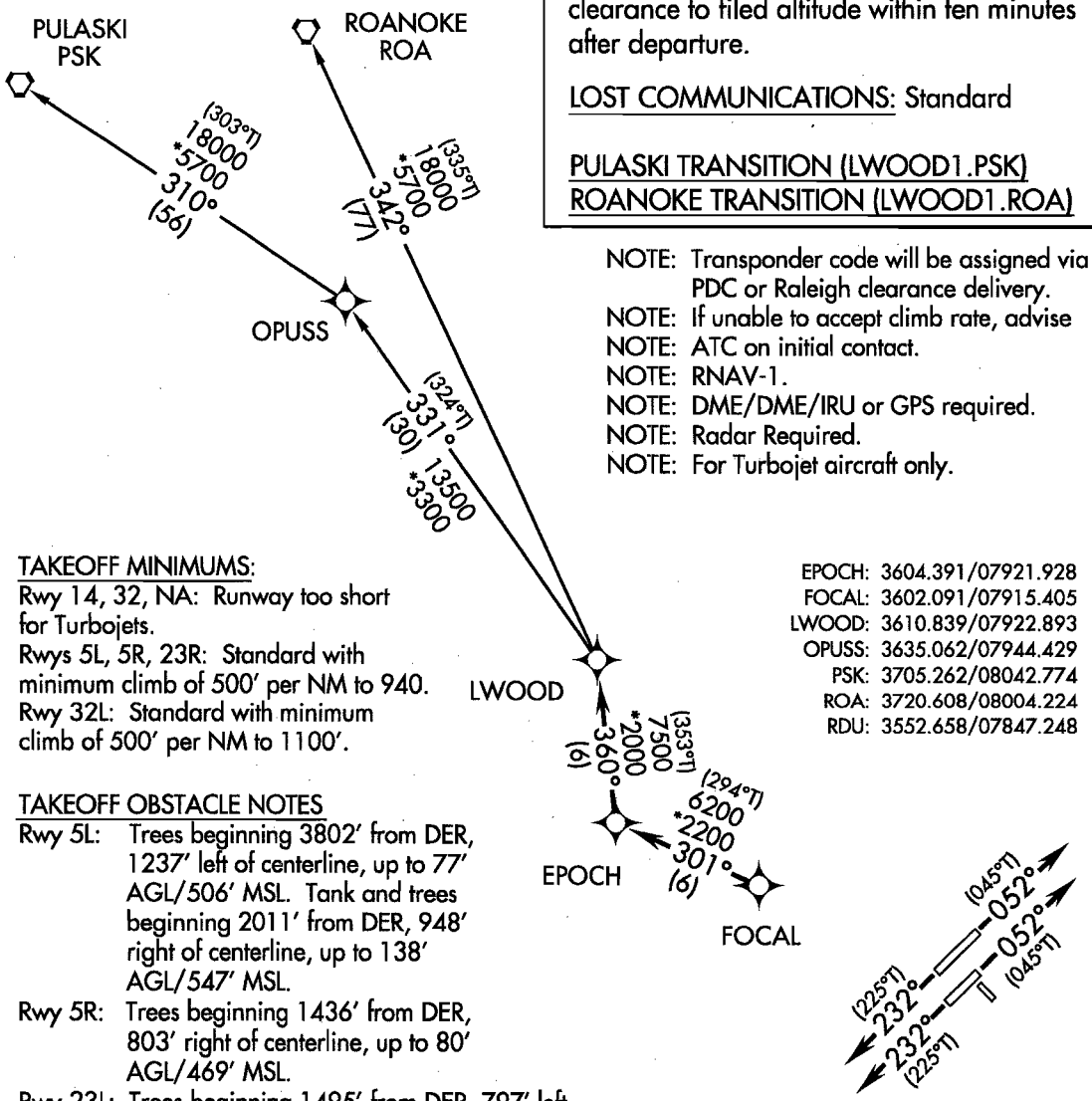
. . . . on assigned transition, maintain 7000 or altitude assigned by ATC. Expect clearance to filed altitude within ten minutes after departure.

LOST COMMUNICATIONS: Standard

PULASKI TRANSITION (LWOOD1.PSK)
ROANOKE TRANSITION (LWOOD1.ROA)

NOTE: Transponder code will be assigned via PDC or Raleigh clearance delivery.
NOTE: If unable to accept climb rate, advise
NOTE: ATC on initial contact.
NOTE: RNAV-1.
NOTE: DME/DME/IRU or GPS required.
NOTE: Radar Required.
NOTE: For Turbojet aircraft only.

PROTOTYPE-NOT FOR NAVIGATION



EPOCH: 3604.391/07921.928
FOCAL: 3602.091/07915.405
LWOOD: 3610.839/07922.893
OPUSS: 3635.062/07944.429
PSK: 3705.262/08042.774
ROA: 3720.608/08004.224
RDU: 3552.658/07847.248

TAKEOFF MINIMUMS:
Rwy 14, 32, NA: Runway too short for Turbojets.
Rwys 5L, 5R, 23R: Standard with minimum climb of 500′ per NM to 940.
Rwy 32L: Standard with minimum climb of 500′ per NM to 1100′.

TAKEOFF OBSTACLE NOTES
Rwy 5L: Trees beginning 3802′ from DER, 1237′ left of centerline, up to 77′ AGL/506′ MSL. Tank and trees beginning 2011′ from DER, 948′ right of centerline, up to 138′ AGL/547′ MSL.
Rwy 5R: Trees beginning 1436′ from DER, 803′ right of centerline, up to 80′ AGL/469′ MSL.
Rwy 23L: Trees beginning 1495′ from DER, 797′ left of centerline, up to 58′ AGL/447′ MSL. Light pole 1457′ from DER, 878′ right of centerline, 93′ AGL/452′ MSL.

NOTE: Chart not to scale.

Airport ID:	KRDU				
Apt Name:	RALEIGH-DURHAM INTL	No	SEGMENT	OBSTRUCTION	ELEV
City:	RALEIGH/DURHAM	S	FOCAL-EPOCH	TOWER	1119
State:	NORTH CAROLINA	S	EPOCH-LWOOD	TOWER	1119
Proc ID:	LWOOD (RNAV)	T	LWOOD-OPUSS	TOWER	1238
Audit #:	ONE				
Scale:	1: 500,000				

fpodws | rdu_lwood (PROD) | 11 Jul 2012 14:27:17 | 1" = 55666.7 feet (MAP)

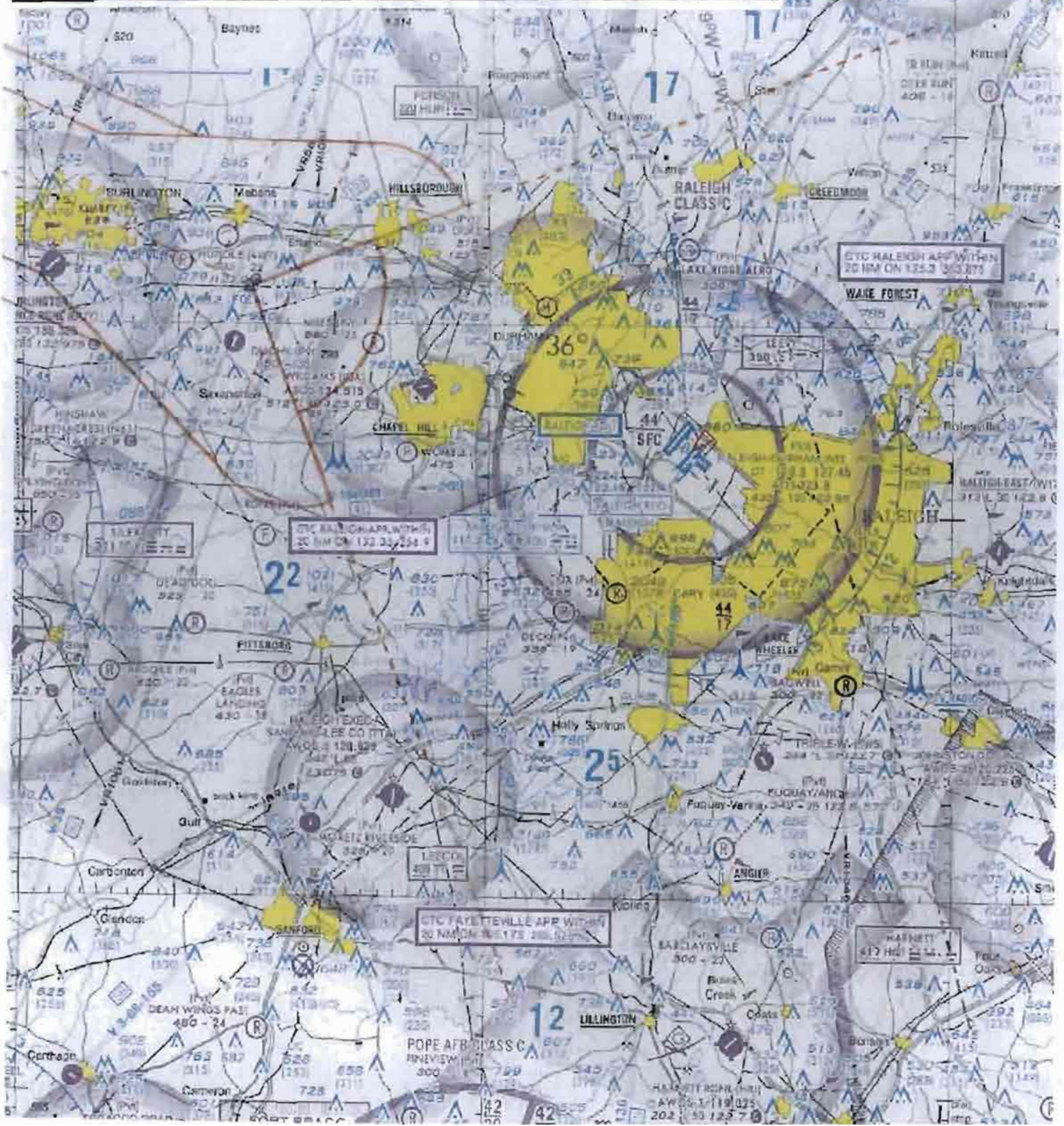
Airport ID:	KRDU				
Apt Name:	RALEIGH-DURHAM INTL	No.	SEGMENT	OBSTRUCTION	ELEV
City:	RALEIGH/DURHAM	U	LWOOD-ROA VTAC	TREE	3671
State:	NORTH CAROLINA	V	OPUSS-PSK VTAC	TREE	3672
Proc ID:	LWOOD (RNAV)				
Amdt #:	ONE				
Scale:	1: 500,000 (75% Scale)				

NM 7 14 21 28 35 42 49

FT 42000 84000 126000 168000 210000 252000 294000

fpodws | rdu_ica (PROD) | 12 Jul 2012 10:23:58 | 1" = 41666.7 feet (MAP)

Airport ID:	KRDU				
Apt Name:	RALEIGH-DURHAM INTL	No.	SEGMENT	OBSTRUCTION	ELEV
City:	RALEIGH/DURHAM		RWY 05L PNA		ASC
State:	NORTH CAROLINA				
Proc ID:	LWOOD (RNAV)				
Amdt #:	ONE				
Scale:	1: 500,000				

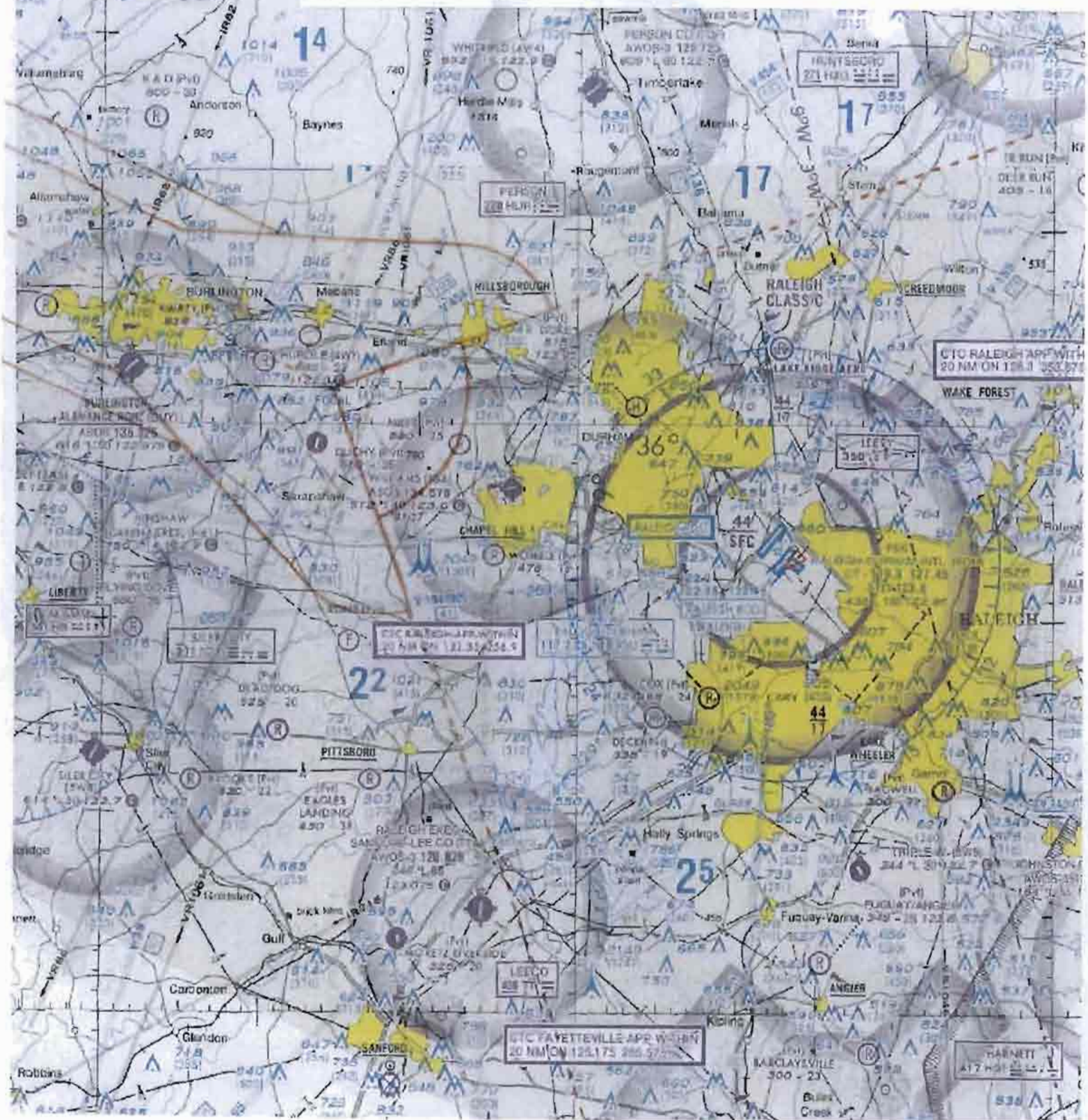


NM 7 14 21 28 35 42 49

FT 42000 84000 126000 168000 210000 252000 294000

fpodws | rdu_ica (PROD) | 17 Jul 2012 16:10:23 | 1" = 41666.7 feet (MAP)

Airport ID:	KRDU	No.	SEGMENT	OBSTRUCTION	ELEV
Apt Name:	RALEIGH-DURHAM INTL		RWY 05R PNA		ASC
City:	RALEIGH/DURHAM				
State:	NORTH CAROLINA				
Proc ID:	LWOOD (RNAV)				
Amdt #:	ONE				
Scale:	1: 500,000				

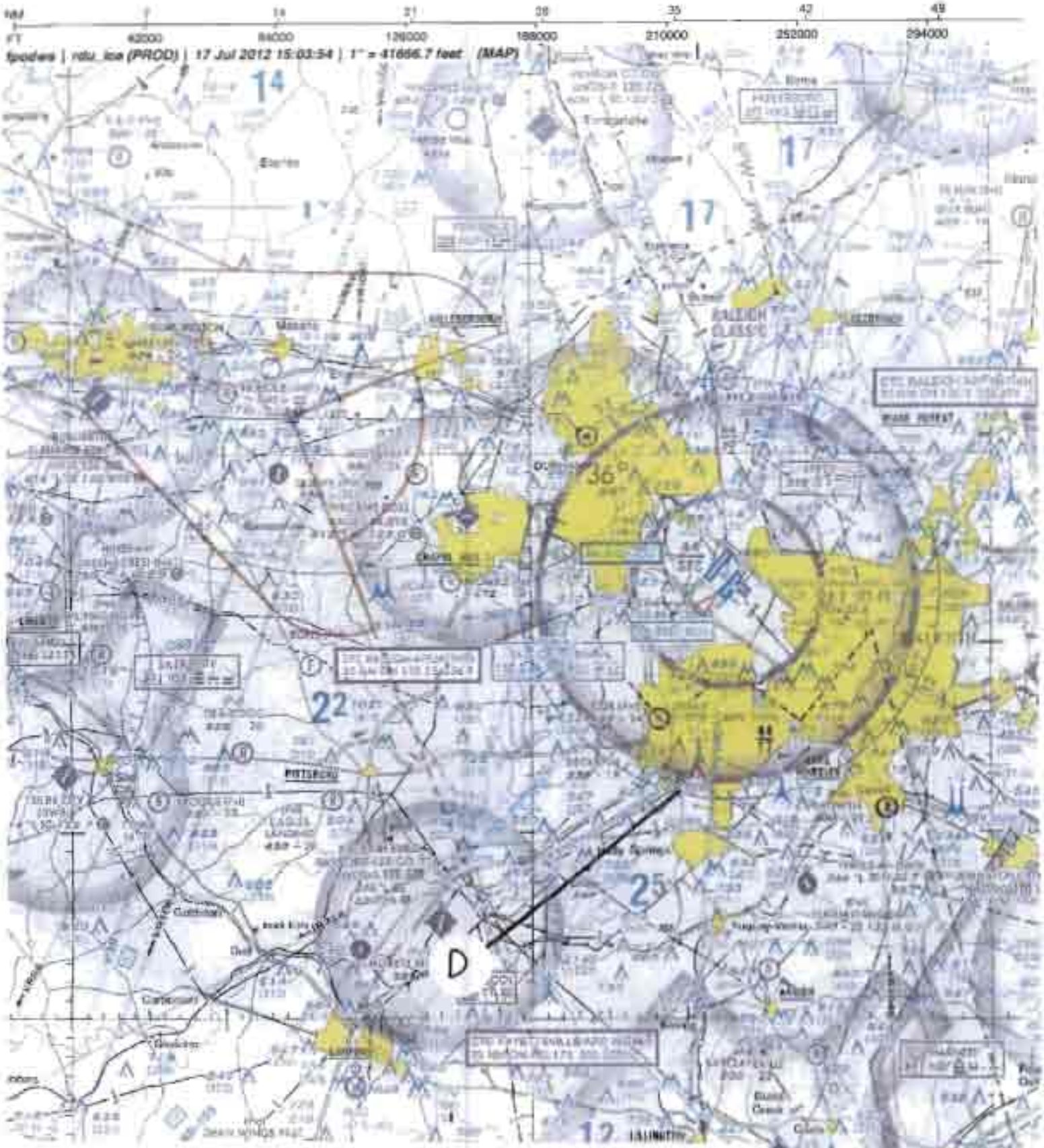


NM 0 7 14 21 28 35 42 49

FT 0 42000 84000 126000 168000 210000 252000 294000

fpodwa | rdu_lca (PROD) | 17 Jul 2012 15:55:55 | 1" = 41666.7 feet (MAP)

Airport ID	KRDU				
Apt Name	RALEIGH-DURHAM INTL	No	SEGMENT	OBSTRUCTION	ELEV
City	RALEIGH/DURHAM		RWY 23L PNA		
State	NORTH CAROLINA	D	RWY 23L PEN	TOWER	2049
Proc ID	LWOOD (RNAV)				
Amdt #	ONE				
Scale	1: 500,000				

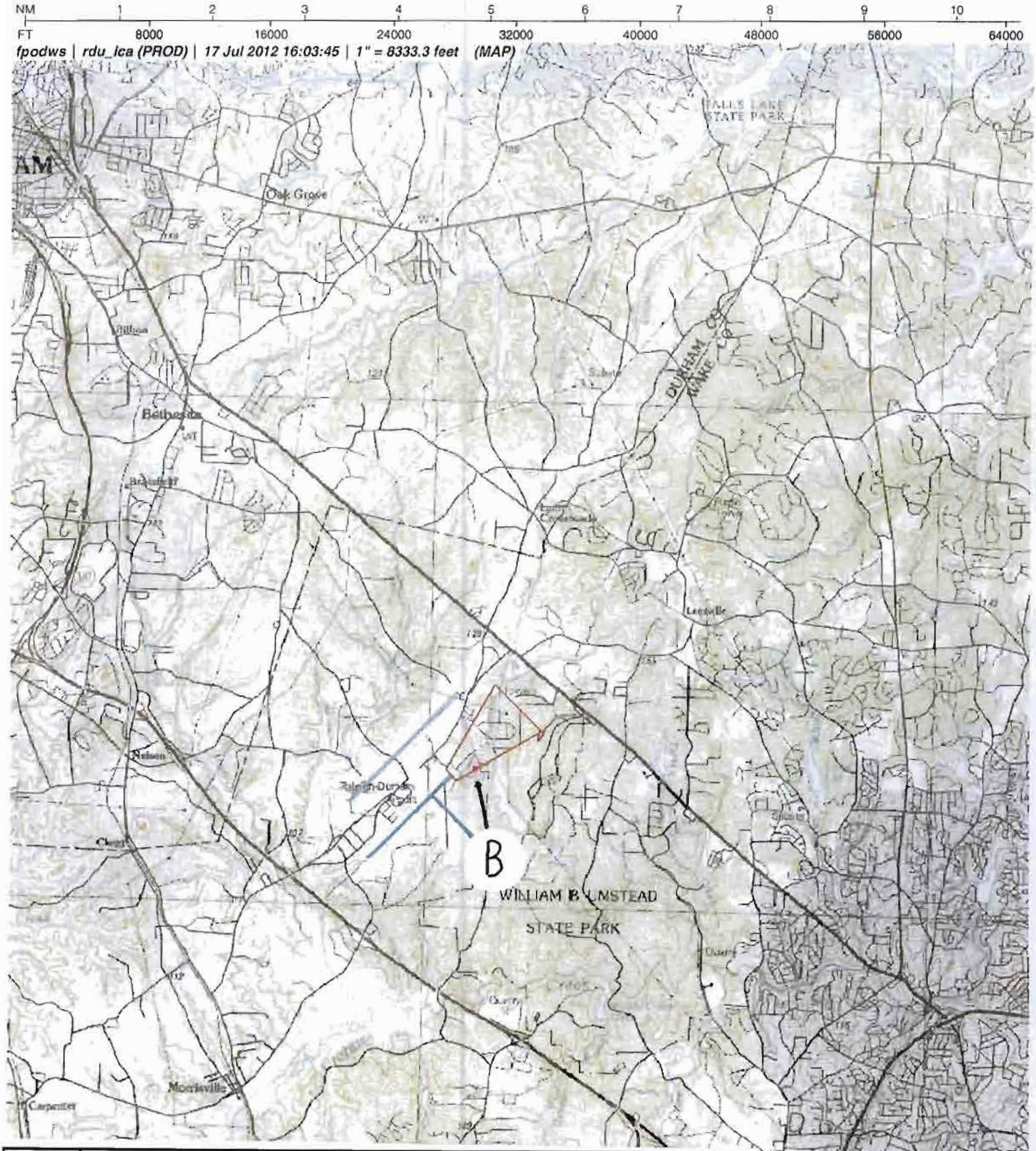


Airport ID:	KRDU				
Apt Name:	RALEIGH-DURHAM INTL	No.	SEGMENT	OBSTRUCTION	ELEV
City:	RALEIGH/DURHAM		RWY 23R PNA		
State:	NORTH CAROLINA	D	RWY 23R PEN	TOWER	2049
Proc ID:	LWOOD (RNAV)				
Amdt #:	ONE				
Scale:	1: 500,000				

Rosa

Airport ID	KRDU				
Apt Name	RALEIGH-DURHAM INTL	No.	SEGMENT	OBSTRUCTION	ELEV
City	RALEIGH/DURHAM	A	RWY 05L ICA	OL ON TANK	547
State	NORTH CAROLINA				
Proc ID	LWOOD (RNAV)				
Amdt #	ONE				
Scale	1: 100,000				

5R



Airport ID:	KRDU				
Apt Name:	RALEIGH-DURHAM INTL	No.	SEGMENT	OBSTRUCTION	ELEV
City:	RALEIGH/DURHAM	B	RWY 05R ICA	TREE	469
State:	NORTH CAROLINA				
Proc ID:	LWOOD (RNAV)				
Amdt #:	ONE				
Scale:	1: 100,000				

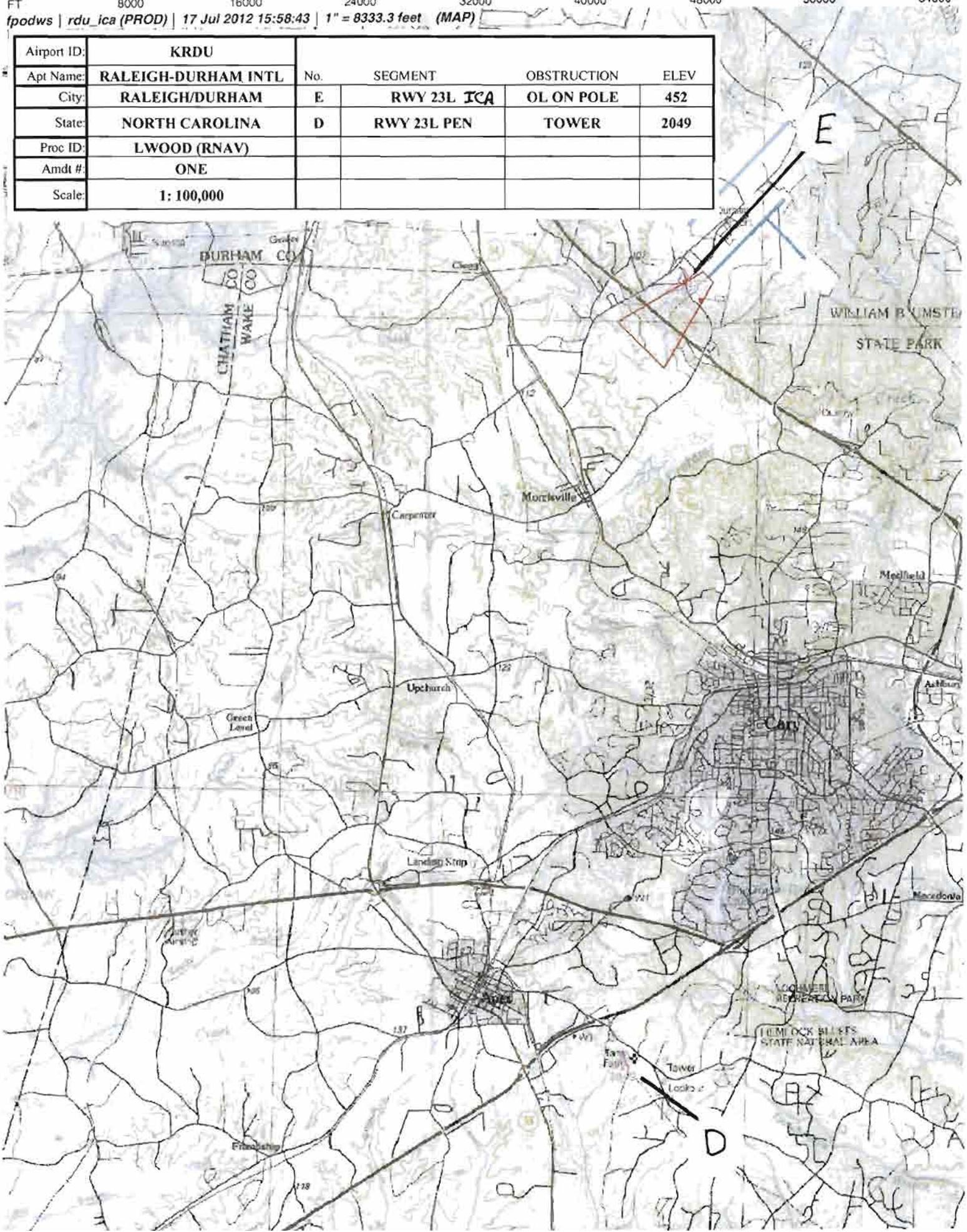
23L

NM 1 2 3 4 5 6 7 8 9 10

FT 8000 16000 24000 32000 40000 48000 56000 64000

fpodws | rdu_ica (PROD) | 17 Jul 2012 15:58:43 | 1" = 8333.3 feet (MAP)

Airport ID:	KRDU				
Apt Name:	RALEIGH-DURHAM INTL	No.	SEGMENT	OBSTRUCTION	ELEV
City:	RALEIGH/DURHAM	E	RWY 23L ICA	OL ON POLE	452
State:	NORTH CAROLINA	D	RWY 23L PEN	TOWER	2049
Proc ID:	LWOOD (RNAV)				
Amdt #:	ONE				
Scale:	1: 100,000				

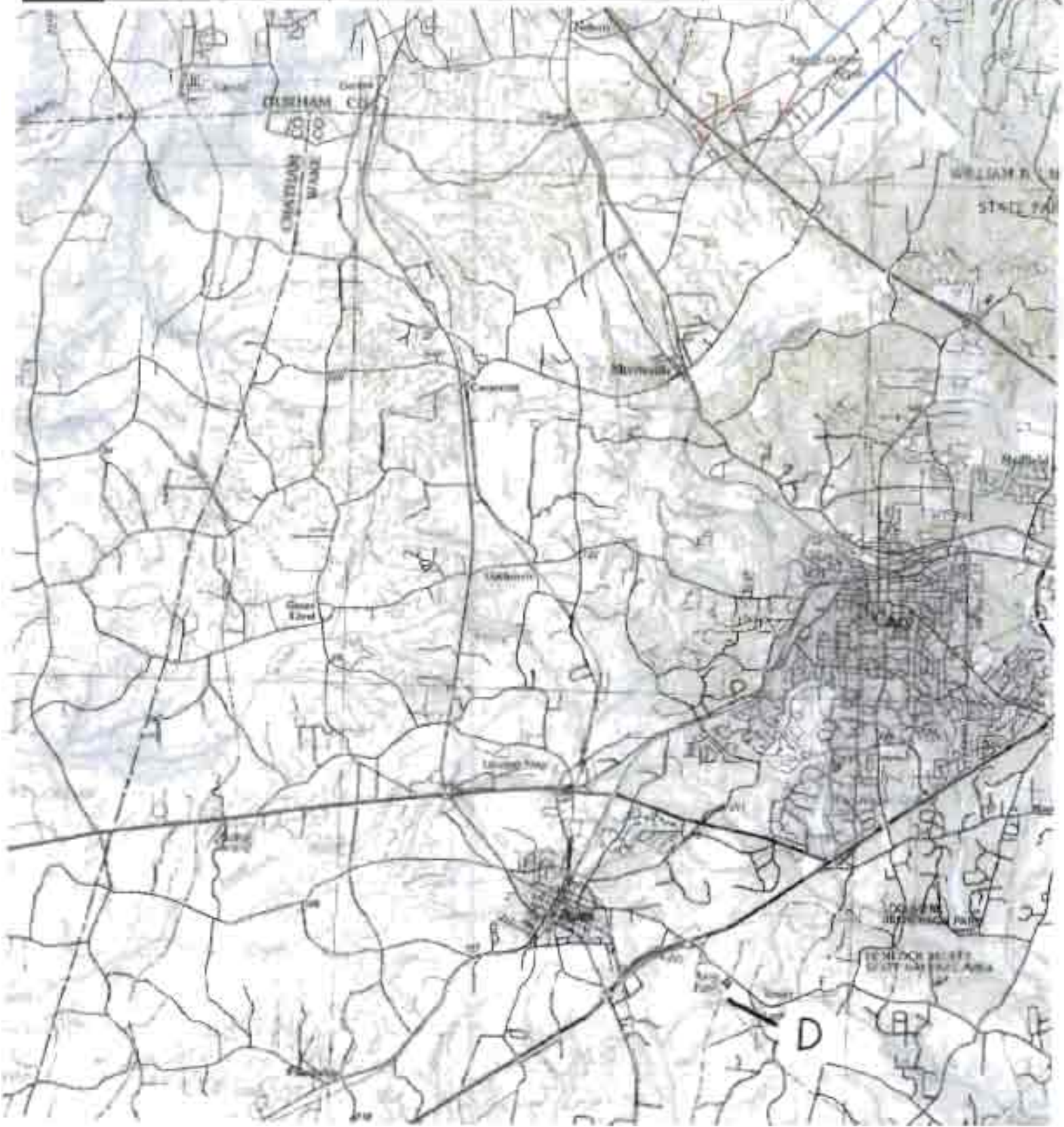


NM 1 2 3 4 5 6 7 8 9 10

FT 8000 16000 24000 32000 40000 48000 56000 64000

fpodws | rdu..ica (PROD) | 17 Jul 2012 14:51:55 | 1" = 8333.3 feet (MAP)

Airport ID	KRDU				
Apt Name	RALEIGH-DURHAM INTL	No.	SEGMENT	OBSTRUCTION	ELEV
City	RALEIGH/DURHAM		RWY 23R ICA		ASC
State	NORTH CAROLINA	D	RWY 23R PEN	TOWER	2049
Proc ID	LWOOD (RNAV)				
Amdt #	ONE				
Scale	1: 100,000				



U.S. DEPARTMENT of TRANSPORTATION – FEDERAL AVIATION ADMINISTRATION

GRAPHIC DEPARTURE PROCEDURE (DP)

Bearings, headings, courses, tracks, and radials are magnetic. Elevation and altitudes are in feet MSL. Altitudes are minimum altitudes unless otherwise indicated. Ceilings are in feet above airport elevation. Distances are in nautical miles. Visibilities are in statue miles or feet RVR unless otherwise indicated. Graphic depictions attached.

DP Name	Number	DP Computer Code	Superseded Number	Dated	Effective Date
LWOOD (RNAV)	ONE	LWOOD1.LWOOD	NONE		

TYPE: RNAV SID

DP ROUTE DESCRIPTION:

TAKEOFF RWY 05L, 05R: CLIMB HEADING 052.14 OR AS ASSIGNED BY ATC, EXPECT RADAR VECTORS TO FOCAL THEN ON DEPICTED ROUTE TO LWOOD, THENCE...
TAKEOFF RWY 23L: CLIMB HEADING 232.15 OR AS ASSIGNED BY ATC, EXPECT RADAR VECTORS TO FOCAL THEN ON DEPICTED ROUTE TO LWOOD, THENCE...
TAKEOFF RWY 23R: CLIMB HEADING 232.16 OR AS ASSIGNED BY ATC, EXPECT RADAR VECTORS TO FOCAL THEN ON DEPICTED ROUTE TO LWOOD, THENCE...

...ON ASSIGNED TRANSITION, MAINTAIN 7000 OR ALTITUDE ASSIGNED BY ATC. EXPECT CLEARANCE TO FILED ALTITUDE WITHIN TEN MINUTES AFTER DEPARTURE.

TRANSITION ROUTES (GRAPHIC DEPICTION ONLY):

Transition Name	Transition Computer Codes	From FIX/NAVAID	To FIX/NAVAID	Course	Distance	MEA	MOCA	Crossing Altitudes/Fixes
PULASKI	LWOOD1.PSK	LWOOD	OPUSS	TRACK 331.39	29.79	13500	3300	
		OPUSS	PSK VORTAC	TRACK 310.07	55.71	18000	5700	
ROANOKE	LWOOD1.ROA	LWOOD	ROA VORTAC	TRACK 341.72	77.19	18000	5700	

PROCEDURAL DATA NOTES/TAKEOFF MINIMUMS:

NOTE: TRANSPONDER CODE WILL BE ASSIGNED VIA PDC OR RALEIGH CLEARANCE DELIVERY.
NOTE: IF UNABLE TO ACCEPT CLIMB RATE, ADVISE ATC ON INITIAL CONTACT.
NOTE: RNAV-1.
NOTE: DME/DME/IRU OR GPS REQUIRED.
NOTE: RADAR REQUIRED.
NOTE: FOR TURBOJET AIRCRAFT ONLY.

TAKEOFF MINIMUMS:
RWY 14, 32, NA – RUNWAY TOO SHORT FOR TURBOJETS.
RWY 05L, 05R, 23R, STANDARD WITH MINIMUM CLIMB OF 500 FT PER NM TO 940.
RWY 23L, STANDARD WITH MINIMUM CLIMB OF 500 FT PER NM TO 1100.

TAKEOFF OBSTACLES NOTES:

RWY 05L, TREES BEGINNING 3802 FT FROM DER, 1237 FT LEFT OF CENTERLINE, UP TO 77 FT AGL/506 FT MSL. TANK AND TREES BEGINNING 2011 FT FROM DER, 948 FT RIGHT OF CENTERLINE, UP TO 138 FT AGL/547 FT MSL.
RWY 05R, TREES BEGINNING 1436 FT FROM DER, 803 FT RIGHT OF CENTERLINE, UP TO 80 FT AGL/469 FT MSL.
RWY 23L, TREES BEGINNING 1495 FT FROM DER, 797 FT LEFT OF CENTERLINE, UP TO 58 FT AGL/447 FT MSL. LIGHT POLE 1457 FT FROM DER, 878 FT RIGHT OF CENTERLINE, 93 FT AGL/452 FT MSL.

QUALITY CHECKED

U.S. DEPARTMENT of TRANSPORTATION – FEDERAL AVIATION ADMINISTRATION

GRAPHIC DEPARTURE PROCEDURE (DP)

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DP Name	Number	DP Computer Code	Superseded Number	Dated	Effective Date
LWOOD (RNAV)	ONE	LWOOD1.LWOOD	NONE		

CONTROLLING OBSTACLES:

RWY 23L, 23R, 2049 FT MSL TOWER (37-001064) 354251.00N/0784903.00W.

LOST COMMUNICATIONS PROCEDURES:

ADDITIONAL FLIGHT DATA:

REFERENCE MAG VAR: KRDU 7W EPOCH YEAR: 1985.
DME/DME ASSESSMENT: SAT (RNP 2.0).

CHART: MEA/MOCA FROM FOCAL TO EPOCH, 6200/2200.
CHART: MEA/MOCA FROM EPOCH TO LWOOD, 7500/2000.

PILOT NAVIGATION AREA:
7NM ARC CENTERED ON FOCAL (IF), CW
FROM: POINT A (BEARING 255.50 TO FOCAL)
TO: POINT B (BEARING 345.50 TO FOCAL)
MINIMUM ALTITUDE - 5000

AIRPORTS SERVED:

RALEIGH-DURHAM INTL – RALEIGH/DURHAM, NC.

COMMUNICATIONS:

ATIS, CLEARANCE DELIVERY, GROUND CONTROL, TOWER, DEPARTURE CONTROL: 132.35/256.9

FIXES AND/OR NAVAIDS:

QUALITY CHECKED

U.S. DEPARTMENT of TRANSPORTATION – FEDERAL AVIATION ADMINISTRATION

GRAPHIC DEPARTURE PROCEDURE (DP)

Bearings, headings, courses, tracks, and radials are magnetic. Elevation and altitudes are in feet MSL. Altitudes are minimum altitudes unless otherwise indicated. Ceilings are in feet above airport elevation. Distances are in nautical miles. Visibilities are in statue miles or feet RVR unless otherwise indicated. Graphic depictions attached.

DP Name	Number	DP Computer Code	Superseded Number	Dated	Effective Date
LWOOD (RNAV)	ONE	LWOOD1.LWOOD	NONE		

REMARKS:

ROANOKE AND PULASKI TRANSITIONS WITHIN MOUNTAINOUS TERRAIN.

FLIGHT INSPECTED BY:

REQUIRED EFFECTIVE DATE:

ROUTINE

DEVELOPED BY:

DAVID SAUER AJV-352 7/17/12

APPROVED BY:

DARRYEL ADAMS AJV-352

COORDINATED WITH:

APA, ALPA, AOPA, ATA, NBAA, ZDC, RDU ATCT, RDU APP CON, RDU AMGR.

CHANGES:

REASONS:

9/25/12: THIS IS AN UPDATED COPY OF THE FORM DEVELOPED ON 7/17/12.
1. CHANGED DP ROUTE DESCRIPTION ON INDIVIDUAL RWYS, FROM"...THENCE..." TO "THEN ON DEPICTED ROUTE TO LWOOD, THENCE..."
2. CHANGED "...ON DEPICTED ROUTE TO LWOOD" TO "...ON ASSIGNED TRANSITION".

QUALITY CHECKED

DEPARTURE (DATA RECORD)

DP Name	Number	DP Computer Code	Superseded Number	Dated	Effective Date
LWOOD (RNAV)	ONE	LWOOD1.LWOOD	NONE		

FIX/NAVAID	LAT/LONG	C	FO/FB	LEG TYPE	TC	DIST (NM)	ALTITUDE	SPEED	REMARKS
RW05L (AER)	355228.02N/0784807.07W	N	-	-	-	-			CG 500 FT/NM TO 940
		-	-	VM	045.14	-			
FOCAL	360205.45N/0791524.28W	Y	FB	DF	-	-			
RW05R (AER)	355152.67N/0784750.42W	N	-	-	-	-			CG 500 FT/NM TO 940
		-	-	VM	045.14	-			
FOCAL	360205.45N/0791524.28W	Y	FB	DF	-	-			
RW23L (AER)	355244.98N/0784645.82W	N	-	-	-	-			CG 500 FT/NM TO 1100
		-	-	VM	225.15	-			
FOCAL	360205.45N/0791524.28W	Y	FB	DF	-	-			
RW23R (AER)	355337.76N/0784640.92W	N	-	-	-	-			CG 500 FT/NM TO 940
		-	-	VM	225.16	-			
FOCAL	360205.45N/0791524.28W	Y	FB	DF	-	-			
FOCAL	360205.45N/0791524.28W	Y	FB	IF	-	-			
EPOCH	360423.46N/0792155.68W	Y	FB	TF	293.50	5.77			
LWOOD	361050.35N/0792253.60W	Y	FB	TF	353.08	6.49			
LWOOD	361050.35N/0792253.60W	Y	-	IF	-	-			LWOOD1.PSK
OPUSS	363503.70N/0794425.71W	Y	FB	TF	324.39	29.79			
PSK VORTAC	370515.74N/0804246.44W	Y	FB	TF	303.07	55.71			
									LWOOD1.ROA
LWOOD	361050.35N/0792253.60W	Y	-	IF	-	-			
ROA VORTAC	372036.47N/0800413.43W	Y	FB	TF	334.72	77.19			

DEPARTURE (DATA RECORD)

DP Name	Number	DP Computer Code	Superseded Number	Dated	Effective Date
LWOOD (RNAV)	ONE	LWOOD1.LWOOD	NONE		

ARINC PACKET - 424-18 - SID

```
                 1         2         3         4         5         6         7         8         9         0         1         2         3
NAVAID  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
        ------------------------------------------------------------------------------------------------------------------------------------
        SUSAD        PSK   K6011680VTHA N37051574W080424644    N37051574W080424644W0060021202     NARPULASKI
        SUSAD        ROA   K6010940VTL  N37203647W080041343    N37203647W080041343W0040030721     NARROANOKE

                 1         2         3         4         5         6         7         8         9         0         1         2         3
WP      123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
        ------------------------------------------------------------------------------------------------------------------------------------
        SUSAEAENRT   EPOCH K70    W     N36042346W079215568                      W0087     NAR           EPOCH
        SUSAEAENRT   FOCAL K70    W     N36020545W079152428                      W0087     NAR           FOCAL
        SUSAEAENRT   LWOOD K70    W     N36105035W079225360                      W0087     NAR           LWOOD
        SUSAEAENRT   OPUSS K60    W     N36350370W079442571                      W0085     NAR           OPUSS

                 1         2         3         4         5         6         7         8         9         0         1         2         3
AIRPORT 123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
        ------------------------------------------------------------------------------------------------------------------------------------
        SUSAP KRDUK7ARDU     0     100YHN35523950W078471490W007000435         1800018000C    MNAR    RALEIGH-DURHAM INTL

                 1         2         3         4         5         6         7         8         9         0         1         2         3
SEGMENT 123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
        ------------------------------------------------------------------------------------------------------------------------------------
        SUSAP KRDUK7DLWOOD14RW05B 010         0        VM                    0521                    18000
        SUSAP KRDUK7DLWOOD14RW05B 020FOCALK7EA0EE   010DF
        SUSAP KRDUK7DLWOOD14RW23B 010         0        VM                    2322                    18000
        SUSAP KRDUK7DLWOOD14RW23B 020FOCALK7EA0EE   010DF
        SUSAP KRDUK7DLWOOD15      010FOCALK7EA0E       IF                                            18000
        SUSAP KRDUK7DLWOOD15      020EPOCHK7EA0E    010TF                    30050058
        SUSAP KRDUK7DLWOOD15      030LWOODK7EA0EE   010TF                    00010065
        SUSAP KRDUK7DLWOOD16PSK   010LWOODK7EA0E       IF                                            18000
        SUSAP KRDUK7DLWOOD16PSK   020OPUSSK6EA0E    010TF                    33140298
        SUSAP KRDUK7DLWOOD16PSK   030PSK  K6D 0VE   010TF                    31010557
        SUSAP KRDUK7DLWOOD16ROA   010LWOODK7EA0E       IF                                            18000
        SUSAP KRDUK7DLWOOD16ROA   020ROA  K6D 0VE   010TF                    34170772

                 1         2         3         4         5         6         7         8         9         0         1         2         3
RUNWAY  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012
        ------------------------------------------------------------------------------------------------------------------------------------
        SUSAP KRDUK7GRW05L   0100000521 N35522802W078480707+0400    +0079800367000057150IIGKK1
        SUSAP KRDUK7GRW05R   0075000521 N35515267W078475042+0400    +0089100397000059150IIRDU1
        SUSAP KRDUK7GRW23L   0075002322 N35524498W078464582-0400    +0099200431000056150IILEI1
        SUSAP KRDUK7GRW23R   0100002322 N35533776W078464092-0400    +0092500409000056150IIDMP3
```

DEPARTURE (DATA RECORD)

DP Name	Number	DP Computer Code	Superseded Number	Dated	Effective Date
LWOOD (RNAV)	ONE	LWOOD1.LWOOD	NONE		

ARINC SUMMARY - 424-18 - SID

ROUTES	TRANSITION	FIX	SEQ	USE	PATH	TURN	FO/FB	RNP	MAG(TRUE)	DISTANCE	ALTITUDE	SPEED
	RW05B		010		VM		FB		052.1()			
	RW05B	FOCAL	020		DF		FB	1.0				
	RW23B		010		VM		FB		232.2()			
	RW23B	FOCAL	020		DF		FB	1.0				
		FOCAL	010		IF		FB					
		EPOCH	020		TF		FB	1.0	300.5()	005.8		
		LWOOD	030		TF		FB	1.0	000.1()	006.5		
	PSK	LWOOD	010		IF		FB					
	PSK	OPUSS	020		TF		FB	1.0	331.4()	029.8		
	PSK	PSK	030		TF		FB	1.0	310.1()	055.7		
	ROA	LWOOD	010		IF		FB					
	ROA	ROA	020		TF		FB	1.0	341.7()	077.2		

POINT DATA

WAYPOINT	LAT IN SECS	LONG IN SECS	LAT IN MINS	LONG IN MINS
PSK	N370515.74	W0804246.44	N3705.262	W08042.774
ROA	N372036.47	W0800413.43	N3720.608	W08004.224
EPOCH	N360423.46	W0792155.68	N3604.391	W07921.928
FOCAL	N360205.45	W0791524.28	N3602.091	W07915.405
LWOOD	N361050.35	W0792253.60	N3610.839	W07922.893
OPUSS	N363503.70	W0794425.71	N3635.062	W07944.429
RW05L	N355228.02	W0784807.07	N3552.467	W07848.118
RW05R	N355152.67	W0784750.42	N3551.878	W07847.840
RW23L	N355244.98	W0784645.82	N3552.750	W07846.764
RW23R	N355337.76	W0784640.92	N3553.629	W07846.682

RUNWAY DATA

RWY	THRESHOLD ELEVATION	TCH
RW05L	00367	57
RW05R	00397	59
RW23L	00431	56
RW23R	00409	56

RADIO FIX AND HOLDING DATA RECORD

NAME: EPOCH **STATE:** NC **COUNTRY:** US

LATITUDE/LONGITUDE: 360423.46N/0792155.68W **TYPE:** WP

AIRSPACE DOCKET: **FIX TYPE OF ACTION:** ESTABLISH

FIX USE:

USE TYPE	USE TITLE	FAC	PAT	AIRPORT IDENT	CITY	STATE
DP	LWOOD (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)

REQUIRED CHARTING: DP

COMPULSORY REPORTING POINT: NO

RECORD REVISION NUMBER: ORIG **DATE OF REVISION:** 01/10/2013

DEVELOPED BY: **DATE:** 07/11/2012 **OFFICE:** AJV-352 **NAME:** DAVID SAUER

APPROVED BY: **DATE:** **OFFICE:** AJV-352 **NAME:** DARRYEL ADAMS

SIGNATURE:

DISTRIBUTION:
NFDC
FPO: EST
ARTCC: ZDC
ATC FACILITY: RDU APP CON
OTHER:

RADIO FIX AND HOLDING DATA RECORD

NAME: FOCAL **STATE:** NC **COUNTRY:** US

LATITUDE/LONGITUDE: 360205.45N/0791524.28W **TYPE:** WP

AIRSPACE DOCKET: **FIX TYPE OF ACTION:** ESTABLISH

FIX USE:

USE TYPE	USE TITLE	FAC	PAT	AIRPORT IDENT	CITY	STATE
DP	LWOOD (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)

REQUIRED CHARTING: DP

COMPULSORY REPORTING POINT: NO

RECORD REVISION NUMBER: ORIG **DATE OF REVISION:** 01/10/2013

DEVELOPED BY: **DATE:** 07/11/2012 **OFFICE:** AJV-352 **NAME:** DAVID SAUER

APPROVED BY: **DATE:** **OFFICE:** AJV-352 **NAME:** DARRYEL ADAMS

SIGNATURE:

DISTRIBUTION:
NFDC
FPO: EST
ARTCC: ZDC
ATC FACILITY: RDU APP CON
OTHER:

RADIO FIX AND HOLDING DATA RECORD

NAME: LWOOD **STATE:** NC **COUNTRY:** US

LATITUDE/LONGITUDE: 361050.35N/0792253.60W **TYPE:** WP

AIRSPACE DOCKET: **FIX TYPE OF ACTION:** ESTABLISH

FIX USE:

USE TYPE	USE TITLE	FAC	PAT	AIRPORT IDENT	CITY	STATE
DP	LWOOD (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)

REQUIRED CHARTING: DP

COMPULSORY REPORTING POINT: NO

RECORD REVISION NUMBER: ORIG **DATE OF REVISION:** 01/10/2013

DEVELOPED BY: **DATE:** 07/12/2012 **OFFICE:** AJV-352 **NAME:** DAVID SAUER

APPROVED BY: **DATE:** **OFFICE:** AJV-352 **NAME:** DARRYEL ADAMS

SIGNATURE:

DISTRIBUTION:
NFDC
FPO: EST
ARTCC: ZDC
ATC FACILITY: RDU APP CON
OTHER:

5

RADIO FIX AND HOLDING DATA RECORD

NAME: OPUSS **STATE:** VA **COUNTRY:** US

LATITUDE/LONGITUDE: 363503.70N/0794425.71W **TYPE:** WP

AIRSPACE DOCKET: **FIX TYPE OF ACTION:** ESTABLISH

FIX USE:

USE TYPE	USE TITLE	FAC	PAT	AIRPORT IDENT	CITY	STATE
DP	LWOOD (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)

REQUIRED CHARTING: DP

COMPULSORY REPORTING POINT: NO

RECORD REVISION NUMBER: ORIG **DATE OF REVISION:** 01/10/2013

DEVELOPED BY: **DATE:** 07/11/2012 **OFFICE:** AJV-352 **NAME:** DAVID SAUER

APPROVED BY: **DATE:** **OFFICE:** AJV-352 **NAME:** DARRYEL ADAMS

SIGNATURE:

DISTRIBUTION: **NFDC**
FPO: EST
ARTCC: ZDC
ATC FACILITY: RDU APP CON
OTHER:

RADIO FIX AND HOLDING DATA RECORD

NAME: ROANOKE VORTAC **STATE:** VA **COUNTRY:** US

LATITUDE/LONGITUDE: 372036.47N/0800413.43W **TYPE:**

AIRSPACE DOCKET: **FIX TYPE OF ACTION:** NO CHANGE

FIX MAKE-UP FACILITIES:

FAC	NAME	IDENT	TYPE	CLASS	MAG BRG	TRUE BRG	DME	DIST FROM FAC NM	DIST FROM FAC FEET	MRA	MAA
1	ROANOKE	ROA	VORTAC	L							45000

EXPANDED SERVICE VOLUME (ESV):

FAC IDENT	FAC TYPE	RADIAL/BEARING	DISTANCE	MIN ALTITUDE	MAX ALTITUDE
ROA	VORTAC	R-180	15	24000	45000

HOLDING: **HOLDING TYPE OF ACTION:** MODIFY

PATTERNS:

PAT	DIR	IDENT	TYPE	RAD/CRS/BRG	CRS INBOUND	TURN (L OR R)	LEG LENGTH TIME	LEG LENGTH DME	HOLDING ALTITUDES MIN	HOLDING ALTITUDES MAX	TEMPLATES MIN	TEMPLATES MAX
1	S	ROA	VORTAC	180.00	360.00	L		15	24000	45000	19	29

REASON FOR NONSTANDARD HOLDING:
PAT 1 ATC REQUEST

HOLDING RESTRICTIONS:
HOLDING LIMITED TO ESTABLISHED PATTERN.

REMARKS:
NAVAID IS CHARTED ON HIGH ENROUTE FOR REFERENCE ONLY.
HOLD PAT 1 USED FOR HIGH ALTITUDE FLOW CONTROL/ATC REQUEST.
HOLDING 15 NM LEGS PER ATC REQUEST. MIN HOLDING TEMPLATE 19 TO ENSURE CONTAINMENT OF 15 NM LEGS.
PRECIPITOUS TERRAIN EVALUATION COMPLETED.

FIX USE:

USE TYPE	USE TITLE	FAC	PAT	AIRPORT IDENT	CITY	STATE
DP	QUAKER			KGSO	GREENSBORO	NC (US)
DP	HIKORY			KHKY	HICKORY	NC (US)
DP	LWOOD (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)
DP	PACKK			KRDU	RALEIGH/DURHAM	NC (US)
DP	QUAKER			KINT	WINSTON-SALEM	NC (US)
DP	WINSTON			KINT	WINSTON-SALEM	NC (US)
DP	BEMAR (RNAV)			KBCB	BLACKSBURG	VA (US)
DP	SETHY (RNAV)			KBCB	BLACKSBURG	VA (US)
DP	TAKEOFF MINIMUMS			KROA	ROANOKE	VA (US)
EN ROUTE	V103					(US)
EN ROUTE	V16					(US)
EN ROUTE	V258					(US)
EN ROUTE	V260					(US)
EN ROUTE	V375					(US)
EN ROUTE	V473					(US)
IAP	LOC/DME RWY 12			KBCB	BLACKSBURG	VA (US)
IAP	NDB-A			KBCB	BLACKSBURG	VA (US)
IAP	RNAV (GPS) RWY 24			KPSK	DUBLIN	VA (US)
IAP	ILS OR LOC RWY 25			KHSP	HOT SPRINGS	VA (US)
IAP	ILS OR LOC RWY 34			KROA	ROANOKE	VA (US)
IAP	LDA RWY 6			KROA	ROANOKE	VA (US)
IAP	VOR/NDB RWY 34			KROA	ROANOKE	VA (US)
IAP	ILS OR LOC RWY 4			KLWB	LEWISBURG	WV (US)
IAP	VOR RWY 22			KLWB	LEWISBURG	WV (US)
IAP	VOR RWY 4			KLWB	LEWISBURG	WV (US)
STAR	NASCR			KVUJ	ALBEMARLE	NC (US)
STAR	SOUTH BOSTON			KIGX	CHAPEL HILL	NC (US)
STAR	MAJIC			KCLT	CHARLOTTE	NC (US)
STAR	SUDSY (RNAV)			KCLT	CHARLOTTE	NC (US)
STAR	NASCR			KJQF	CONCORD	NC (US)
STAR	SOUTH BOSTON			K1A5	FRANKLIN	NC (US)
STAR	MAJIC			KAKH	GASTONIA	NC (US)
STAR	HENBY			KGSO	GREENSBORO	NC (US)
STAR	MAJIC			KIPJ	LINCOLNTON	NC (US)
STAR	MAJIC			KEQY	MONROE	NC (US)
STAR	SOUTH BOSTON			KHNZ	OXFORD	NC (US)
STAR	ALDAN (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)
STAR	FRAZI (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)
STAR	SOUTH BOSTON			KRDU	RALEIGH/DURHAM	NC (US)
STAR	SOUTH BOSTON			KTDF	ROXBORO	NC (US)
STAR	NASCR			KRUQ	SALISBURY	NC (US)
STAR	SOUTH BOSTON			KTTA	SANFORD	NC (US)
STAR	MAJIC			KEHO	SHELBY	NC (US)
STAR	SOUTH BOSTON			KJNX	SMITHFIELD	NC (US)
STAR	MAJIC			KAFP	WADESBORO	NC (US)

STAR	MAJIC	KN52	WAXHAW	NC (US)
STAR	MAJIC	KDCM	CHESTER	SC (US)
STAR	MAJIC	KLKR	LANCASTER	SC (US)
STAR	MAJIC	KUZA	ROCK HILL	SC (US)

REQUIRED CHARTING: DP, STAR, IAP, CONTROLLER, EN ROUTE LOW, EN ROUTE HIGH

COMPULSORY REPORTING POINT: NO

RECORD REVISION NUMBER: 11 **DATE OF REVISION:** 01/10/2013

REASON FOR REVISION:
1. CHANGE PAT 1 MIN TEMPLATE FROM 18 TO 19.
2. CHANGED REMARK "...MIN HOLDING TEMPLATE AMENDED FROM 16 TO 18 TO ENSURE..." TO "...MIN HOLDING TEMPLATE 19 TO ENSURE..."
3. UPDATED FIX USE.

DEVELOPED BY: **DATE:** 08/21/2012 **OFFICE:** AJV-352 **NAME:** DAVID SAUER

APPROVED BY: **DATE:** **OFFICE:** AJV-352 **NAME:** DARRYEL ADAMS

SIGNATURE:

DISTRIBUTION:
NFDC
FPO: EST
ARTCC: ZDC
ATC FACILITY: ROA APP CON
OTHER:

INFO ONLY

RADIO FIX AND HOLDING DATA RECORD

NAME: PULASKI VORTAC **STATE:** VA **COUNTRY:** US

LATITUDE/LONGITUDE: 370515.74N/0804246.44W **TYPE:**

AIRSPACE DOCKET: **FIX TYPE OF ACTION:** MODIFY

FIX MAKE-UP FACILITIES:

FAC	NAME	IDENT	TYPE	CLASS	MAG BRG	TRUE BRG	DME	DIST FROM FAC NM	DIST FROM FAC FEET	MRA	MAA
1	PULASKI	PSK	VORTAC	H							45000

HOLDING: **HOLDING TYPE OF ACTION:** MODIFY

PATTERNS:

PAT	DIR	IDENT	TYPE	RAD/CRS/BRG	CRS INBOUND	TURN (L OR R)	LEG LENGTH TIME	LEG LENGTH DME	HOLDING ALTITUDES MIN	HOLDING ALTITUDES MAX	TEMPLATES MIN	TEMPLATES MAX
1	S	PSK	VORTAC	198.00	018.00	R	1		5000	6000	5	5
2	S		WP	198.00	018.00	R		5	5500	6000	6	6

CONTROLLING OBSTRUCTIONS:

PAT	AIRSPEED	OBSTRUCTION	COORDINATES	ELEVATION	ACCURACY CODE
1	200	AAO	365549.75N/0804002.35W	3699	2C
2	200	AAO	365549.75N/0804002.35W	3699	2C

HOLDING RESTRICTIONS:
HOLDING LIMITED TO ESTABLISHED PATTERNS.

REMARKS:
PRECIPITOUS TERRAIN EVALUATION COMPLETED.

FIX USE:

USE TYPE	USE TITLE	FAC	PAT	AIRPORT IDENT	CITY	STATE
DP	HORNET			KCLT	CHARLOTTE	NC (US)
DP	HUGO			KCLT	CHARLOTTE	NC (US)
DP	HORNET			KJQF	CONCORD	NC (US)
DP	HUGO			KJQF	CONCORD	NC (US)
DP	HORNET			KAKH	GASTONIA	NC (US)
DP	HUGO			KAKH	GASTONIA	NC (US)
DP	TRIAD			KGSO	GREENSBORO	NC (US)
DP	HICKORY			KHKY	HICKORY	NC (US)
DP	HORNET			KEQY	MONROE	NC (US)
DP	HUGO			KEQY	MONROE	NC (US)
DP	LWOOD (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)
DP	TRIAD			KINT	WINSTON-SALEM	NC (US)
DP	WINSTON			KINT	WINSTON-SALEM	NC (US)
DP	HORNET			KUZA	ROCK HILL	SC (US)
DP	HUGO			KUZA	ROCK HILL	SC (US)
DP	KNOXVILLE			KTYS	KNOXVILLE	TN (US)
DP	BEMAR (RNAV)			KBCB	BLACKSBURG	VA (US)
DP	SETHY (RNAV)			KBCB	BLACKSBURG	VA (US)
DP	TAKEOFF MINIMUMS			KBCB	BLACKSBURG	VA (US)
EN ROUTE	J22					(US)
EN ROUTE	J53					(US)
EN ROUTE	T203					(US)
EN ROUTE	V136					(US)
EN ROUTE	V16					(US)
EN ROUTE	V37					(US)
EN ROUTE	V45					(US)
EN ROUTE	V466					(US)
EN ROUTE	V470					(US)
EN ROUTE	V59					(US)
IAP	LOC/DME RWY 12		1	KBCB	BLACKSBURG	VA (US)
IAP	NDB-A			KBCB	BLACKSBURG	VA (US)
IAP	RNAV (GPS) RWY 30		2	KBCB	BLACKSBURG	VA (US)
IAP	ILS OR LOC Y RWY 6		1	KPSK	DUBLIN	VA (US)
IAP	ILS OR LOC Z RWY 6		1	KPSK	DUBLIN	VA (US)
IAP	RNAV (GPS) RWY 24			KPSK	DUBLIN	VA (US)
IAP	RNAV (GPS) RWY 6			KPSK	DUBLIN	VA (US)
IAP	VOR-A		1	KPSK	DUBLIN	VA (US)
IAP	VOR/DME RWY 6		1	KPSK	DUBLIN	VA (US)
IAP	RNAV (GPS) RWY 19			KHLX	GALAX/HILLSVILLE	VA (US)
IAP	LOC RWY 26			KMKJ	MARION/WYTHEVILLE	VA (US)
IAP	RNAV (GPS) RWY 26			KMKJ	MARION/WYTHEVILLE	VA (US)
IAP	LDA RWY 6			KROA	ROANOKE	VA (US)
IAP	RNAV (GPS) RWY 6			KROA	ROANOKE	VA (US)
STAR	BRUSH			KCVG	COVINGTON	KY (US)
STAR	BRUSH			KK62	FALMOUTH	KY (US)
STAR	SMOKN			KGSO	GREENSBORO	NC (US)
STAR	FRAZI (RNAV)			KRDU	RALEIGH/DURHAM	NC (US)
STAR	SOUTH BOSTON			KRDU	RALEIGH/DURHAM	NC (US)
STAR	SMOKN			KINT	WINSTON SALEM	NC (US)
STAR	BRUSH			KI69	BATAVIA	OH (US)

STAR	BRUSH	KISZ	CINCINNATI	OH (US)
STAR	BRUSH	KLUK	CINCINNATI	OH (US)
STAR	BRUSH	KHAO	HAMILTON	OH (US)

REQUIRED CHARTING: DP, STAR, IAP, CONTROLLER, EN ROUTE LOW, EN ROUTE HIGH

COMPULSORY REPORTING POINT: LOW

RECORD REVISION NUMBER: 18 **DATE OF REVISION:** 05/31/2012

REASON FOR REVISION:
UPDATED PAT 1 AND 2 HOLDING CONTROLLING OBSTACLES.

DEVELOPED BY: **DATE:** 09/26/2011 **OFFICE:** AJV-352 **NAME:** DONALD SMITH (AISHAT NAUZO)

APPROVED BY: **DATE:** 03/09/2012 **OFFICE:** AJV-352 **NAME:** DARRYEL ADAMS

SIGNATURE:

DISTRIBUTION:
NFDC
FPO: EST
ARTCC: ZTL
ATC FACILITY: ROA APP/CON
OTHER:

Name:	Dennis Osterhage
Project Name:	KRDU RNAV SIDS
Output File:	KRDU LWOOD1 SID FOCAL ROA 20120716_1654
Procedure Name:	LWOOD1
Software:	RNAV-Pro™
Version:	2.36
Date/Time:	7/16/2012 4:54:19 PM
Input File:	KRDU LWOOD1 SID PNA_FOCAL_ROA CCW 20120716_1640.txt
Databases:	AVNIS Date: 02/07/2012
	Obstacle Date: 08/28/2011
	NFD Date: 09/30/2010
	DTED® (MAX) Date: 2002

Results Summary:

Flyability	✔
DME/DME	✔
Radars	?
Comms	?
TERPS	?

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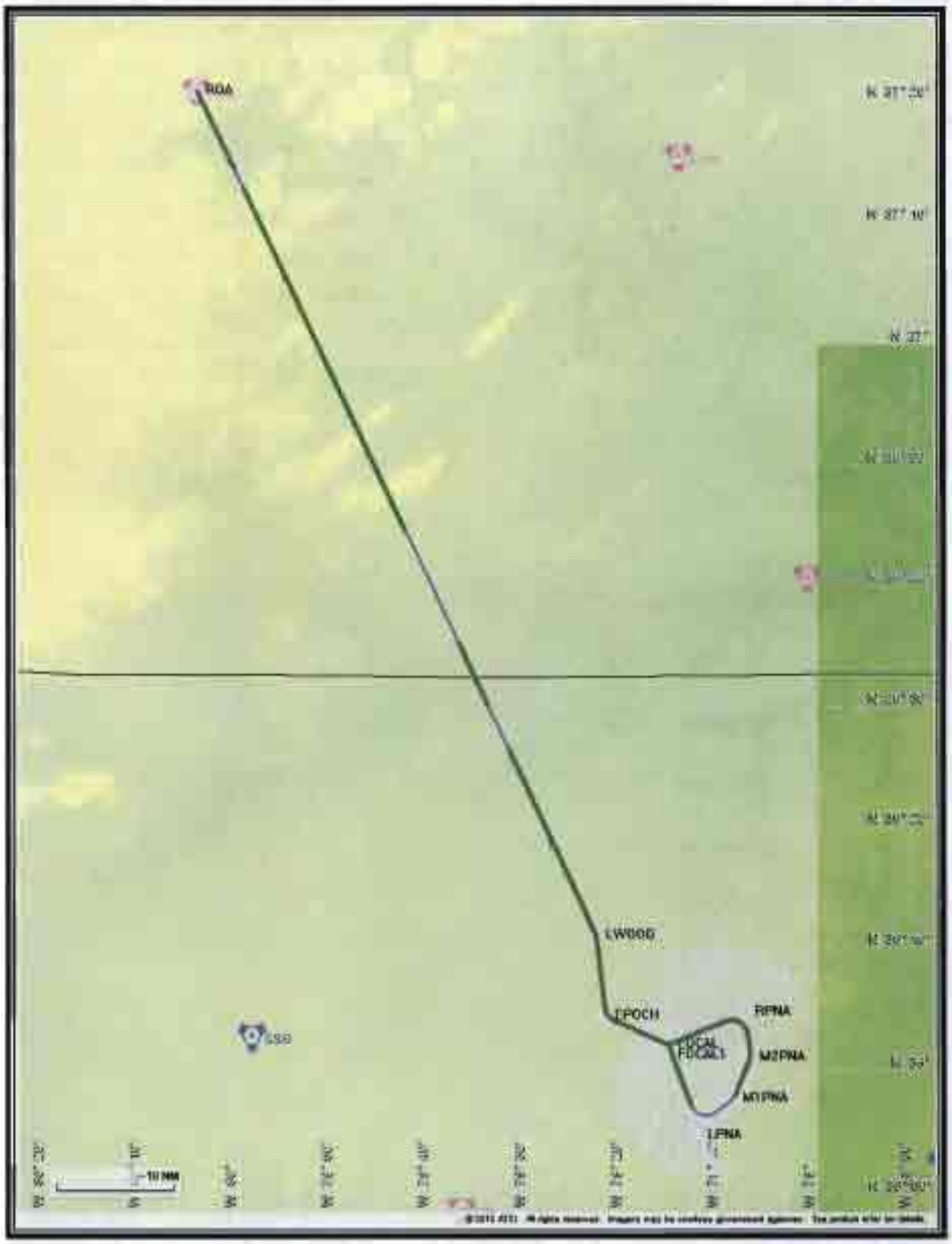

ROA
LWOOD
CPOCH
FOCAL
FOCAL1
RPNA
M2PNA
M1PNA
LPNA
10 NM

Flight Plan

Return To Summary

Name	Type	Lat/Lon	Alt [Ft]	VNAV Mode	IAS [Kts]	Turn Type	Leg Type
FOCAL	WP	N 36° 2' 5.45" W 79° 15' 24.28"	5000.0	VNAV	180.0	Fly Over	TF
LPNA	WP	N 35° 55' 34.23" W 79° 12' 14.24"	5000.0	VNAV	180.0	Fly By	TF
M1PNA	WP	N 35° 57' 43.77" W 79° 8' 39.04"	5000.0	VNAV	180.0	Fly By	TF
M2PNA	WP	N 36° 1' 3.41" W 79° 6' 52.15"	5000.0	VNAV	180.0	Fly By	TF
RPNA	WP	N 36° 4' 39.74" W 79° 7' 22.40"	5000.0	VNAV	180.0	Fly By	TF
FOCAL1	WP	N 36° 2' 5.45" W 79° 15' 24.28"	5000.0	VNAV	180.0	Fly By	TF
EPOCH	WP	N 36° 4' 23.46" W 79° 21' 55.68"	6153.3	VNAV	180.0	Fly By	TF
LWOOD	WP	N 36° 10' 50.35" W 79° 22' 53.60"	7450.6	VNAV	180.0	Fly By	TF
ROA	WP	N 37° 20' 36.47" W 80° 4' 13.43"	18000.0	VNAV	240.0	Fly Over	TF

Flyability

Return To Summary

Settings:

Flight Type: Departure with PNA
Selected Airport: KRDU
Aircraft Category: Cat D
Climb Gradient: *None assigned*
Ground Speeds:

Table

200.0 Kts up to **11000.0 Ft.**
240.0 Kts up to **18000.0 Ft.**
260.0 Kts up to **24000.0 Ft.**
340.0 Kts up to **99900.0 Ft.**

Wind Settings: *None assigned*
Descent During a Turn: Allowed
VNAV Mode: Flight Plan

Entire track is fly-able

DME/DME

Return To Summary

Settings:

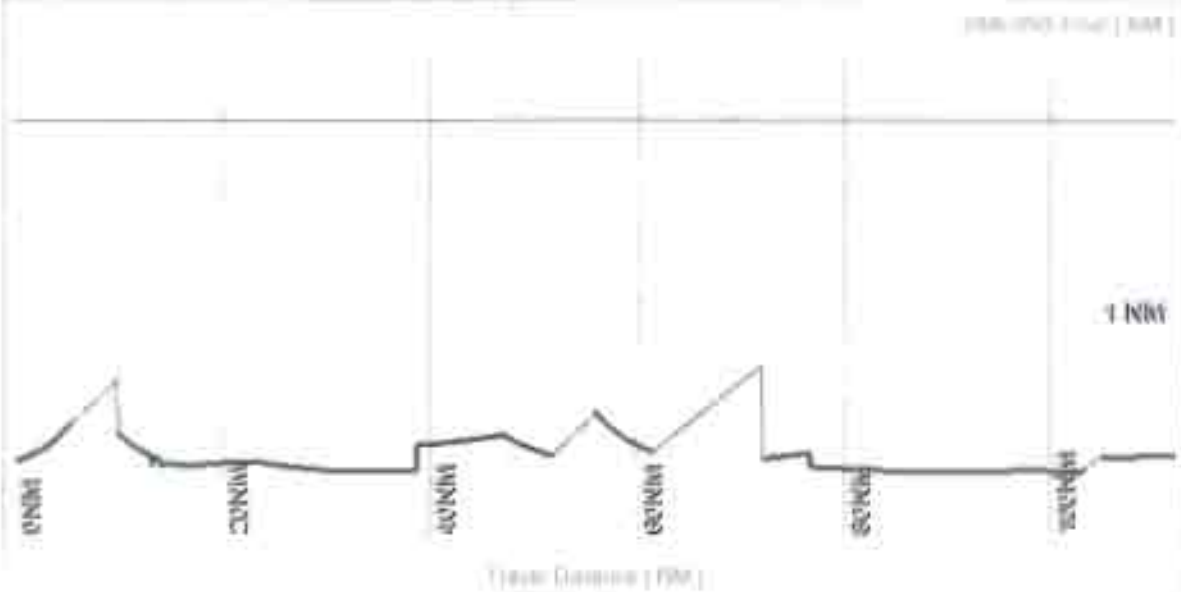
RNP: 2.0
Flight Mode: Manual
Line of Sight (DTED Level 0 Max): Evaluated
DME Restrictions: Evaluated
Inertial Drift: Enabled
  Initial Drift: 0.558 NM
  INS Drift Rate: 8.000 NM/Hour
Range Mode: OSV
Co-Frequencies: Evaluated
RNP Edges: Evaluated
Min DME Range: 3.0 NM
Allowed Gap Length: 4.0 NM
DME Types: VOR/DME , VORTAC , TACAN , and User
DME Include Angles: 30 to 150
Critical DMEs: Allowed
DoD Facilities: Not included
Foreign Facilities: Not included
Low & Terminal DMEs: Included
Flight Check DMEs: Selected
Higher Altitudes: Evaluated
Near Maximum Altitude: Evaluated

Total Number of DMEs Used: 7

Maximum DME Error: 0.712 NM

No Critical DMEs were found.

Available DMEs: GSO, LIB, RDU, SBV, ROA, LYH, BKW, LWB



DME/DME (Continued.)

Return To Summary

DMEs Used

#	Name	Lat/Lon/MAGVAR	Range	Source	Critical	Err. [NM]	Status	Time	Distance
1	LIB	N 35° 48' 41.84" W 79° 36' 45.35" W 3	L	Database	NO	1.062	Enabled	37.3 %	34.5 %
2	RDU	N 35° 52' 21.08" W 78° 47' 0.03" W 4	H	Database	NO	0.881	Enabled	33.0 %	30.4 %
3	SBV	N 36° 40' 30.15" W 79° 0' 52.21" W 5	L	Database	NO	1.363	Enabled	22.2 %	21.2 %
4	GSO	N 36° 2' 44.49" W 79° 58' 34.95" W 3	H	Database	NO	1.083	Enabled	23.0 %	23.1 %
5	ROA	N 37° 20' 36.47" W 80° 4' 13.43" W 4	L	Database	NO	0.868	Enabled	20.9 %	23.2 %
6	LYH	N 37° 15' 16.70" W 79° 14' 11.30" W 5	L	Database	NO	0.898	Enabled	21.2 %	23.5 %
7	BKW	N 37° 46' 49.08" W 81° 7' 24.44" W 6	H	Database	NO	0.712	Enabled	5.5 %	6.1 %

Flight Check DME Selection

Distance [NM]	Selected DMEs					Alternate
0.0	LIB	RDU	GSO			
5.1	LIB	RDU	GSO			
6.9	LIB	RDU				
12.6	LIB	RDU	SBV			
14.8	LIB	RDU	SBV	GSO		
21.9	LIB	RDU	GSO			
27.4	LIB	RDU	GSO	SBV		
34.2	LIB	RDU	GSO	SBV		
72.0	ROA	SBV	LYH			
82.1	ROA	RDU	LYH	BKW	GSO	LWB

DME/DME (Continued.)

Return To Summary

Inertial Drift Segments

#	Start Location	End Location	Length [NM]
1	N 35° 57' 13.60" W 79° 13' 2.17"	N 35° 57' 58.65" W 79° 8' 32.21"	4.6
	VOR: DAN	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 58.65" W 79° 8' 32.21"	
	VOR: GSO	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 0.41" W 79° 9' 50.21"	
	VOR: LIB	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 58.65" W 79° 8' 32.21"	
	VOR: RDU	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 58.65" W 79° 8' 32.21"	
2	N 36° 26' 21.67" W 79° 31' 57.84"	N 36° 29' 58.79" W 79° 34' 5.42"	4.0
	VOR: DAN	Available from N 36° 26' 21.67" W 79° 31' 57.84" to N 36° 29' 58.79" W 79° 34' 5.42"	
	VOR: GSO	Available from N 36° 26' 21.67" W 79° 31' 57.84" to N 36° 29' 58.79" W 79° 34' 5.42"	
	VOR: LIB	Available from N 36° 26' 21.67" W 79° 31' 57.84" to N 36° 28' 37.37" W 79° 33' 17.56"	
	VOR: SBV	Available from N 36° 26' 21.67" W 79° 31' 57.84" to N 36° 29' 58.79" W 79° 34' 5.42"	
3	N 36° 35' 8.79" W 79° 37' 7.93"	N 36° 44' 38.20" W 79° 42' 44.29"	10.5
	VOR: DAN	Available from N 36° 35' 8.79" W 79° 37' 7.93" to N 36° 44' 38.20" W 79° 42' 44.29"	
	VOR: GSO	Available from N 36° 35' 8.79" W 79° 37' 7.93" to N 36° 39' 48.99" W 79° 39' 53.26"	
	VOR: SBV	Available from N 36° 35' 8.79" W 79° 37' 7.93" to N 36° 44' 38.20" W 79° 42' 44.29"	
	VOR: LYH	Available from N 36° 41' 26.55" W 79° 40' 50.90" to N 36° 44' 38.20" W 79° 42' 44.29"	
	VOR: ODR	Available from N 36° 41' 59.09" W 79° 41' 10.15" to N 36° 44' 38.20" W 79° 42' 44.29"	
	VOR: ROA	Available from N 36° 44' 30.97" W 79° 42' 40.00" to N 36° 44' 38.20" W 79° 42' 44.29"	

DME/DME (Continued.)

Return To Summary

Inertial Drift Segments (Continued.)

#	Start Location	End Location	Length [NM]
4	N 37° 12' 41.95" W 79° 59' 28.01"	N 37° 14' 23.04" W 80° 0' 28.71"	1.9
	VOR: LYH	Available from N 37° 12' 41.95" W 79° 59' 28.01" to N 37° 14' 23.04" W 80° 0' 28.71"	
	VOR: ODR	Available from N 37° 12' 41.95" W 79° 59' 28.01" to N 37° 14' 23.04" W 80° 0' 28.71"	
	VOR: PSK	Available from N 37° 12' 41.95" W 79° 59' 28.01" to N 37° 14' 23.04" W 80° 0' 28.71"	
	VOR: ROA	Available from N 37° 12' 41.95" W 79° 59' 28.01" to N 37° 14' 23.04" W 80° 0' 28.71"	

Name:	Dennis Osterhage
Project Name:	KRDU RNAV SIDS
Output File:	KRDU LWOOD1 SID FOCAL PSK 20120716_1734
Procedure Name:	LWOOD1
Software:	RNAV-Pro™
Version:	2.36
Date/Time:	7/16/2012 5:34:47 PM
Input File:	KRDU LWOOD1 SID PNA_FOCAL_PSK CCW 20120716_1640.txt
Databases:	AVNIS Date: 02/07/2012
	Obstacle Date: 08/26/2011
	NFD Date: 09/30/2010
	DTED® (MAX) Date: 2002

Results Summary:

Flyability	✔
DME/DME	✔
Radars	?
Comms	?
TERPS	?

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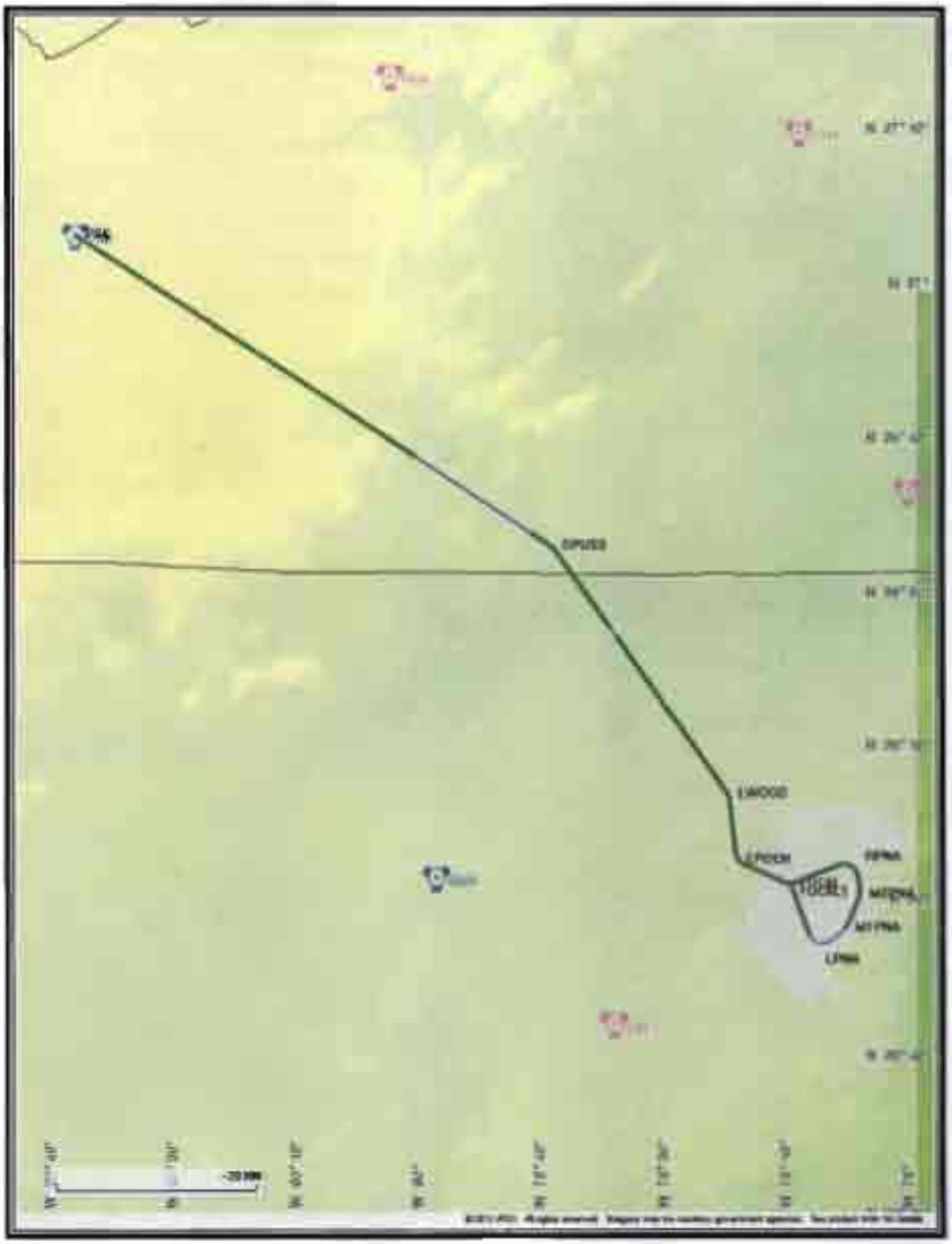

LWOOD

Flight Plan

Return To Summary

Name	Type	Lat/Lon	Alt [Ft]	VNAV Mode	IAS [Kts]	Turn Type	Leg Type
FOCAL	WP	N 36° 2' 5.45" W 79° 15' 24.28"	5000.0	VNAV	180.0	Fly Over	TF
LPNA	WP	N 35° 55' 34.23" W 79° 12' 14.24"	5000.0	VNAV	180.0	Fly By	TF
M1PNA	WP	N 35° 57' 43.77" W 79° 8' 39.04"	5000.0	VNAV	180.0	Fly By	TF
M2PNA	WP	N 36° 1' 3.41" W 79° 6' 52.15"	5000.0	VNAV	180.0	Fly By	TF
RPNA	WP	N 36° 4' 39.74" W 79° 7' 22.40"	5000.0	VNAV	180.0	Fly By	TF
FOCAL1	WP	N 36° 2' 5.45" W 79° 15' 24.28"	5000.0	VNAV	180.0	Fly By	TF
EPOCH	WP	N 36° 4' 23.46" W 79° 21' 55.68"	6153.3	VNAV	180.0	Fly By	TF
LWOOD	WP	N 36° 10' 50.35" W 79° 22' 53.60"	7450.6	VNAV	180.0	Fly By	TF
OPUSS	WP	N 36° 35' 3.70" W 79° 44' 25.71"	13408.7	VNAV	210.0	Fly By	TF
PSK	WP	N 37° 5' 15.74" W 80° 42' 46.44"	18000.0	VNAV	240.0	Fly Over	TF

Flyability

Return To Summary

Settings:

Flight Type: Departure with PNA
Selected Airport: KRDU
Aircraft Category: Cat D
Climb Gradient: *None assigned*
Ground Speeds:

Table:

200.0 Kts up to **11000.0 Ft.**
240.0 Kts up to **18000.0 Ft.**
260.0 Kts up to **24000.0 Ft.**
340.0 Kts up to **99900.0 Ft.**

Wind Settings: *None assigned*
Descent During a Turn: Allowed
VNAV Mode: Flight Plan

Entire track is fly-able

DME/DME

Return To Summary

Settings:

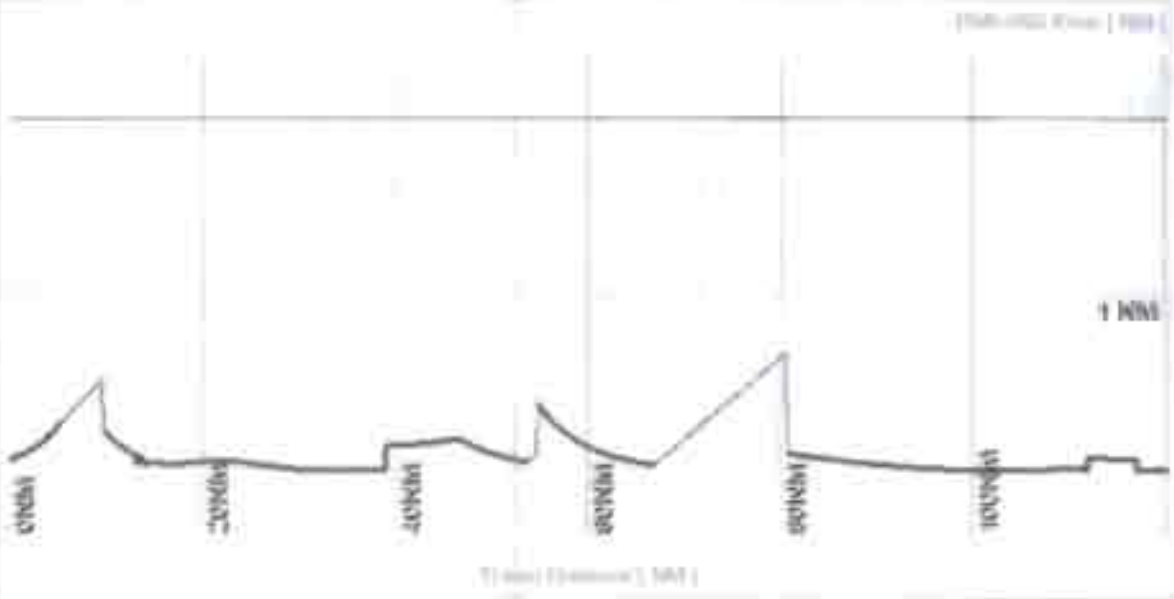
RNP: 2.0
Flight Mode: Manual
Line of Sight (DTED Level 0 Max): Evaluated
DME Restrictions: Evaluated
Inertial Drift: Enabled
Initial Drift: 0.558 NM
INS Drift Rate: 8.000 NM/Hour
Range Mode: OSV
Co-Frequencies: Evaluated
RNP Edges: Evaluated
Min DME Range: 3.0 NM
Allowed Gap Length: 4.0 NM
DME Types: VOR/DME , VORTAC , TACAN , and User
DME Include Angles: 30 to 150
Critical DMEs: Allowed
DoD Facilities: Not included
Foreign Facilities: Not included
Low & Terminal DMEs: Included
Flight Check DMEs: Selected
Higher Altitudes: Evaluated
Near Maximum Altitude: Evaluated

Total Number of DMEs Used: 8

Maximum DME Error: 0.761 NM

No Critical DMEs were found

Available DMEs: GSO, LIB, RDU, SBV, PSK, ROA, BLF, BKW, HVQ



DME/DME (Continued.)

Return To Summary

DMEs Used

#	Name	Lat/Lon/MAGVAR	Range	Source	Critical	Err. [NM]	Status	Time	Distance
1	LIB	N 35° 48' 41.84" W 79° 36' 45.35" W 3	L	Database	NO	1.082	Enabled	36.8 %	33.4 %
2	RDU	N 35° 52' 21.08" W 78° 47' 0.03" W 4	H	Database	NO	0.881	Enabled	31.5 %	28.6 %
3	SBV	N 36° 40' 30.15" W 79° 0' 52.21" W 5	L	Database	NO	1.365	Enabled	23.7 %	23.3 %
4	GSO	N 36° 2' 44.49" W 79° 58' 34.95" W 3	H	Database	NO	1.214	Enabled	18.2 %	18.5 %
5	PSK	N 37° 5' 15.74" W 80° 42' 46.44" W 6	H	Database	NO	0.846	Enabled	22.0 %	23.9 %
6	ROA	N 37° 20' 36.47" W 80° 4' 13.43" W 4	L	Database	NO	1.311	Enabled	30.2 %	32.9 %
7	BKW	N 37° 46' 49.08" W 81° 7' 24.44" W 6	H	Database	NO	0.761	Enabled	2.4 %	2.6 %
8	HVQ	N 38° 20' 58.84" W 81° 46' 11.68" W 3	H	Database	NO	0.761	Enabled	3.9 %	4.2 %

Flight Check DME Selection

Distance [NM]	Selected DMEs					Alternate
0.0	LIB	RDU	GSO			
5.1	LIB	RDU	GSO			
8.9	LIB	RDU				
12.6	LIB	RDU	SBV			
14.8	LIB	RDU	SBV	GSO		
21.9	LIB	RDU	GSO			
27.4	LIB	RDU	GSO	SBV		
34.1	LIB	RDU	GSO	SBV		
63.7	GSO	SBV				
73.9	GSO	ROA	PSK	RDU		
101.2	GSO	ROA	PSK	HVQ	BKW	BLF

DME/DME (Continued.)

Return To Summary

Inertial Drift Segments

#	Start Location	End Location	Length [NM]
1	N 35° 57' 13.60" W 79° 13' 2.17"	N 35° 57' 58.65" W 79° 8' 32.21"	4.6
	VOR: DAN	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 58.65" W 79° 8' 32.21"	
	VOR: GSO	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 0.41" W 79° 9' 50.21"	
	VOR: LIB	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 58.65" W 79° 8' 32.21"	
	VOR: RDU	Available from N 35° 57' 13.60" W 79° 13' 2.17" to N 35° 57' 58.65" W 79° 8' 32.21"	
2	N 36° 26' 18.52" W 79° 36' 36.77"	N 36° 27' 13.05" W 79° 37' 25.35"	1.1
	VOR: DAN	Available from N 36° 26' 18.52" W 79° 36' 36.77" to N 36° 27' 13.05" W 79° 37' 25.35"	
	VOR: GSO	Available from N 36° 26' 18.52" W 79° 36' 36.77" to N 36° 27' 13.05" W 79° 37' 25.35"	
	VOR: LIB	Available from N 36° 26' 18.52" W 79° 36' 36.77" to N 36° 27' 13.05" W 79° 37' 25.35"	
	VOR: SBV	Available from N 36° 26' 18.52" W 79° 36' 36.77" to N 36° 27' 13.05" W 79° 37' 25.35"	
3	N 36° 36' 25.77" W 79° 47' 0.89"	N 36° 43' 54.53" W 80° 1' 20.26"	13.7
	VOR: DAN	Available from N 36° 36' 25.77" W 79° 47' 0.89" to N 36° 43' 54.53" W 80° 1' 20.26"	
	VOR: GSO	Available from N 36° 36' 25.77" W 79° 47' 0.89" to N 36° 42' 47.09" W 79° 59' 10.75"	
	VOR: SBV	Available from N 36° 36' 25.77" W 79° 47' 0.89" to N 36° 38' 14.79" W 79° 50' 29.16"	
	VOR: ODR	Available from N 36° 39' 39.80" W 79° 53' 11.80" to N 36° 43' 54.53" W 80° 1' 20.26"	
	VOR: ROA	Available from N 36° 41' 6.95" W 79° 55' 58.70" to N 36° 43' 54.53" W 80° 1' 20.26"	
	VOR: PSK	Available from N 36° 43' 39.31" W 80° 0' 51.01" to N 36° 43' 54.53" W 80° 1' 20.26"	

Name:	Dennis Osterhage
Project Name:	KRDU RNAV SIDS
Software:	RNAV-Pro™
Version:	2.36
Date/Time:	6/21/2012 9:09:17 AM
Input File:	Grid Area Assessment
Databases:	AVNIS Date: 02/07/2012
	Obstacle Date: 08/26/2011
	NFD Date: 09/30/2010
	DTED® (MAX) Date: 2002

Results Summary:

Grid	✔	DME/DME Grid Analysis

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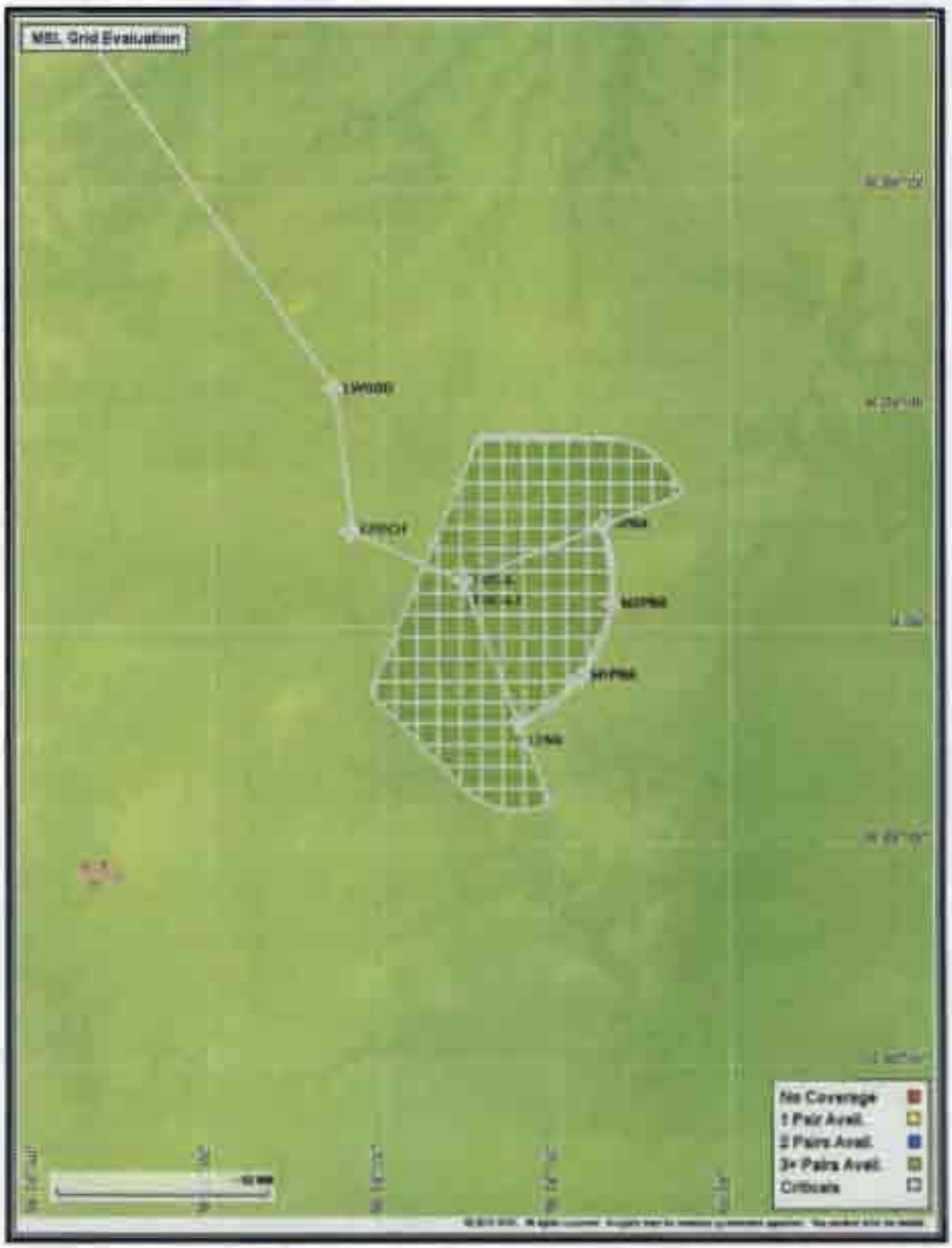
MSL Grid Evaluation
No Coverage
1 Pair Avail.
2 Pairs Avail.
3+ Pairs Avail.
Criticals

DME/DME Grid Analysis

Return To Summary

Coverage Exists

Settings:

Polygon Grid Definition:

1	Lat: N 35° 55' 34.29" Lon: W 79° 12' 14.06"	21	Lat: N 36° 7' 35.86" Lon: W 79° 4' 0.74"
2	Lat: N 35° 51' 50.77" Lon: W 79° 10' 25.45"	22	Lat: N 36° 7' 14.59" Lon: W 79° 3' 35.82"
3	Lat: N 35° 51' 41.67" Lon: W 79° 10' 59.72"	23	Lat: N 36° 6' 51.01" Lon: W 79° 3' 14.29"
4	Lat: N 35° 51' 36.03" Lon: W 79° 11' 35.10"	24	Lat: N 36° 6' 25.48" Lon: W 79° 2' 56.46"
5	Lat: N 35° 51' 33.95" Lon: W 79° 12' 11.06"	25	Lat: N 36° 6' 8.21" Lon: W 79° 2' 47.08"
6	Lat: N 35° 51' 35.44" Lon: W 79° 12' 47.06"	26	Lat: N 36° 4' 39.90" Lon: W 79° 7' 22.48"
7	Lat: N 35° 51' 40.49" Lon: W 79° 13' 22.57"	27	Lat: N 36° 4' 39.89" Lon: W 79° 7' 22.48"
8	Lat: N 35° 51' 49.02" Lon: W 79° 13' 57.07"	28	Lat: N 36° 3' 51.05" Lon: W 79° 7' 2.93"
9	Lat: N 35° 52' 0.91" Lon: W 79° 14' 30.03"	29	Lat: N 36° 3' 0.64" Lon: W 79° 6' 50.86"
10	Lat: N 35° 52' 15.98" Lon: W 79° 15' 0.97"	30	Lat: N 36° 2' 9.41" Lon: W 79° 6' 46.45"
11	Lat: N 35° 52' 34.00" Lon: W 79° 15' 29.43"	31	Lat: N 36° 1' 18.13" Lon: W 79° 6' 49.77"
12	Lat: N 35° 52' 47.02" Lon: W 79° 15' 46.21"	32	Lat: N 36° 0' 27.55" Lon: W 79° 7' 0.74"
13	Lat: N 35° 57' 1.29" Lon: W 79° 20' 48.27"	33	Lat: N 35° 59' 38.44" Lon: W 79° 7' 19.22"
14	Lat: N 36° 8' 46.15" Lon: W 79° 14' 30.80"	34	Lat: N 35° 58' 51.53" Lon: W 79° 7' 44.92"
15	Lat: N 36° 8' 40.21" Lon: W 79° 7' 17.73"	35	Lat: N 35° 58' 7.50" Lon: W 79° 8' 17.45"
16	Lat: N 36° 8' 37.94" Lon: W 79° 6' 41.66"	36	Lat: N 35° 57' 27.02" Lon: W 79° 8' 56.32"
17	Lat: N 36° 8' 32.13" Lon: W 79° 6' 6.20"	37	Lat: N 35° 56' 50.70" Lon: W 79° 9' 40.97"

DME/DME Grid Analysis (Continued.)

Return To Summary

Coverage Exists

Settings:

Polygon Grid Definition:

18	Lat: N 36° 8' 22.85" Lon: W 79° 5' 31.87"	**38**	Lat: N 35° 56' 19.06" Lon: W 79° 10' 30.71"
19	Lat: N 36° 8' 10.25" Lon: W 79° 4' 59.21"	**39**	Lat: N 35° 55' 52.58" Lon: W 79° 11' 24.82"
20	Lat: N 36° 7' 54.50" Lon: W 79° 4' 28.68"	**40**	Lat: N 35° 55' 34.29" Lon: W 79° 12' 14.06"

Lat Step: 1 NM
Lon Step: 1 NM
Line of Sight (DTED Level 0 Max): Evaluated
DME Restrictions: Evaluated
Co-Frequencies: Evaluated
Min DME Range: 3.0 NM
Allowed Gap Length: 4.0 NM
DME Types: VOR/DME and VORTAC
DME Include Angles: 30 to 150
DoD Facilities: Not included
Foreign Facilities: Not included
Low & Terminal DMEs: Included
Maximum Possible ESVs Used
Altitude: 5000.0 Ft. MSL
PNA Import from RDVA-Pro: KRDU PNA FOCAL EPOCH

DME/DME Grid Analysis (Continued.)

Return To Summary

Maximum Gap: 0.0 NM

Maximum Critical Gap: 0.0 NM

	AGL Altitudes
Min Cell Altitude	4,176.5 Ft.
Max Cell Altitude	4,465.2 Ft.
Mean Cell Altitude	4,300.6 Ft.
Std. Dev. Cell Altitude	65.6 Ft.

Statistics based only on passing cells.

Most Used DMEs: TYI (173), SDZ (173), SBV (173), ROA (173), RDU (173), LIB (173), GSO (173), FAY (173), BZM (173), and ISO (145).