

Precipitation Processing System (PPS) Product Format Description

Hourly Digital Precip Array (DPA)

DPA is a digital product, not directly displayable. It is generated every volume scan. The Product Symbology block contains several layers:

- Hourly accumulation data – 1 Hr. digital data – 131 x 131 array (approx. 4 x 4 km² grid)
- Rate Scan data (1/4 LFM) 13 x 13 arrays (approx. 40 x 40 km² grids)
(note: number of rate scan layers may vary from 1 to 16 with number of volume scans in the hour)
- Alphanumeric data (ASCII)
 - Adaptable parameters
 - Bias Table
 - Supplemental data

The hourly accumulation data are compacted in a 1/40-LFM grid with a maximum of 256 levels, and the scan rate data are compacted in a 1/4 LFM grid with a maximum of 8 levels. The 8 levels are defined as follows:

8-Level Code	Display	Range (in/hr)
0	0.0	0.0<in/hr<0.1
1	0.1	0.1<in/hr<0.3
2	0.3	0.3<in/hr<0.5
3	0.5	0.5<in/hr<1.0
4	1.0	1.0<in/hr<2.0
5	2.0	2.0<in/hr<4.0
6	4.0	4.0<in/hr
7	ND	

This product is not compressed.

The following table provides a detailed specification of the DPA product.

Highlighted areas in the description below indicate changes since the previous Build

[Note: a half-word (INT*2) is 16 bits]

MESSAGE HEADER

References

2620001F (Class I User ICD):
Fig 3-3 "Message Header"

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
01	Message Code	INT*2	N/A	81	N/A	From Fig 3-3
02	Date of Message	INT*2	Julian Date	1 to 32,767	1	From Fig 3-3
03-04	Time of Message	INT*4	Seconds	0 to 86,399	1	From Fig 3-3
05-06	Length of Message	INT*4	Bytes	3400 to 42266	1	From Fig 3-3
07	Source ID	INT*2	N/A	0 to 999	1	From Fig 3-3
08	Destination ID	INT*2	N/A	0 to 999	1	From Fig 3-3
09	Number of Blocks	INT*2	N/A	3	1	From Fig 3-3

PRODUCT DESCRIPTION BLOCK

References

2620001F (Class I Users ICD):
Fig 3-6 "Graphic Product Message" Sheet 2, Sheet 6, Sheet 7
Table III "Message Codes for Products"
Table V "Product Dependent HALFWORD Definition for Product Description Block"

2620003F (Product Spec ICD):
Section 28.2.2 "Color Level Code Table"

"Digital Precipitation Array Product Format", published by the WSR-88D Operational Support Facility, March 18 1996

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
10	Block Divider	INT*2	NA	-1	N/A	From Fig 3-6 Sheet 6
11-12	Latitude of Radar	INT*4	Degrees	-90 to +90	0.001	From Fig 3-6 Sheet 6
13-14	Longitude of Radar	INT*4	Degrees	-180 to +180	0.001	From Fig 3-6 Sheet 6
15	Height of Radar	INT*2	Feet	-100 to +11000	1	From Fig 3-6 Sheet 6
16	Product Code	INT*2	N/A	81		From Table III
17	Operational Mode	INT*2	N/A	0 to 2	N/A	From Fig 3-6 Sheet 6
18	Volume Coverage Pattern	INT*2	N/A	1 to 767	N/A	From Fig 3-6 Sheet 6
19	Sequence Number	INT*2	N/A	-13, 0 to 32767	1	From Fig 3-6 Sheet 6
20	Volume Scan Number	INT*2	N/A	1 to 80	1	From Fig 3-6

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
						Sheet 6
21	Volume Scan Date	INT*2	Julian Date	1 to 32767	1	From Fig 3-6 Sheet 6
22-23	Volume Scan Start Time	INT*4	Seconds GMT	0 to 86399	1	From Fig 3-6 Sheet 6
24	Product Generation Date	INT*2	Julian Date	1 to 32767	1	From Fig 3-6 Sheet 6
25-26	Product Generation Time	INT*4	Seconds	0 to 86399	1	From Fig 3-6 Sheet 6
27	Not used			0		From OSF doc
28	Not used			0		From OSF doc
29	Elevation Number	INT*2	N/A	0 to 20	1	From Fig 3-6 Sheet 6
30	Not used			0		From OSF doc
31	Minimum DPA data level	INT*2	dBa	-6.0	0.1	From OSF doc
32	Data level increment	INT*2	dBa	.125	0.001	From OSF doc
33	Number of data levels	INT*2	N/A	256	1	From OSF doc
34	Not used			0		From OSF doc
35	Not used			0		From OSF doc
36	Not used			0		From OSF doc
37	Not used			0		From OSF doc
38	Not used			0		From OSF doc
39	Not used			0		From OSF doc
40	Not used			0		From OSF doc
41	Not used			0		From OSF doc
42	Not used			0		From OSF doc
43	Not used			0		From OSF doc
44	Not used			0		From OSF doc
45	Not used			0		From OSF doc
46	Not used			0		From OSF doc
47	Maximum Rainfall accum	INT*2	dBa	0; -6.0 to 25.625	0.125	DOORS version of Class I Users ICD
48	Mean field bias	INT*2	N/A	.01 to 99.99	0.01	DOORS version of Class I Users ICD
49	Effective Number G-R pairs (sample size)	INT*2	N/A	.00 to 9999.99	0.01	DOORS version of Class I Users ICD
50	Hourly accum End Date	INT*2	Julian Date	1 to 32767	1	DOORS version of Class I Users ICD
51	Hourly accum End Time	INT*2	Minutes	0 to 1439	1	DOORS version of Class I Users ICD
52	Not used	INT*2	N/A	0	N/A	From OSF doc
53	Not used	INT*2	N/A	0	N/A	From OSF doc
54	Version	INT*1	N/A	0 to 2	1	From Sheet 7, Note 2 - DOORS version of Class I Users ICD

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
54	Spot Blank	INT*1	N/A	0 to 1	1	From Fig 3-6 Sheet 6
55-56	Offset to Product Symbology block	INT*4	Half-words	60	1	From OSF doc
57-58	Offset to Graphic Alphanumeric block	INT*4	Half-words	0	1	From OSF doc
59-60	Offset to Tabular Alphanumeric block	INT*4	Half-words	0	1	From OSF doc

PRODUCT SYMBOLOGY BLOCK

References

2620001F (Class I User ICD):

Section 3.2.1.2 “Product Symbology Block”
 Fig 3-6 “Graphic Product Message” (Sheet 8)
 Fig 3-8b “Text and Special Symbol Packets”
 Fig 3-11a “Digital Precip Data Array Packet”
 Fig 3-11b “Precip Rate Data Array Packet”

2620003 (ICD for Product Specification):

Appendix C, Format VII “DPA”

“Decoding of DPA Products”, published by OHD/HSEB, updated as of AWIPS Release OB3 (1/8/04)

“Digital Precipitation Array Product Format”, published by the WSR-88D Operational Support Facility, March 18 1996

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
61	Block Divider	INT*2	N/A	-1	N/A	From Fig 3-6 Sheet 8
62	Block ID	INT*2	N/A	1	N/A	From Fig 3-6 Sheet 8
63-64	Length of Block	INT*4	Bytes	3280 to 42146	1	From Fig 3-6 Sheet 8
65	Number of Layers	INT*2	N/A	3 to 18	1	DOORS version of Class I Users ICD
BEGINNING OF THE DPA HOURLY DATA LAYER						
66	Digital Data Layer Divider	INT*2	N/A	-1	N/A	From Fig 3-6 Sheet 8
67-68	Length of Data Layer in bytes not including layer divider and layer length	INT*4	Bytes	534 to 34594	1	From Fig 3-6 Sheet 8
69	Packet Code	INT*2	N/A	17	N/A	From Fig 3-11 a
70	Spare	INT*2	N/A	0	N/A	From Fig 3-11 a
71	Spare	INT*2	N/A	0	N/A	From Fig 3-11 a

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
	Row 131: Run Length Code N (N = 1 to 131)	INT*1	N/A	1 to 131	1	Fig 3-11a
	Row 131: Data Level Code N (N = 1 to 131)	INT*1	N/A	0 to 255	1	Fig 3-11a
BEGINNING OF THE DPA RATE SCAN LAYERS (The number of layers will be variable as per the number of rate scans in the hour)						
O-Rate	Rate Scan layer #1 divider	INT*2	N/A	-1	N/A	OSF doc
O-Rate +1 to +2	Rate Scan Layer #1 length in bytes not including layer divider and layer length	INT*4	Bytes	62 to 218	1	OSF doc
O-Rate +3	Rate Scan packet code	INT*2	N/A	18	N/A	Fig 3-11b
O-Rate +4	Spare	INT*2	N/A	0	N/A	Fig 3-11b
O-Rate +5	Spare	INT*2	N/A	0	N/A	Fig 3-11b
O-Rate +6	Number of 1/4 LFM boxes in row	INT*2	N/A	13	1	Fig 3-11b
O-Rate +7	Number of rows	INT*2	N/A	13	1	Fig 3-11b
O-Rate +8	Row N: Number of RLE bytes in row not including this field	INT*2	Bytes	2 – 14	1	} repeat
O-Rate +9	Run Length Code (1)	4-bit	N/A	1 – 13	1	}
	Data Level Code (1)	4-bit	N/A	0 – 15	1	} for
	Run Length Code (2)	4-bit	N/A	1 – 13	1	}
	Data Level Code (2)	4-bit	N/A	0 – 15	1	} each
O-Rate+10	Run Length Code (3)	4-bit	N/A	1 – 13	1	}
	Data Level Code (3)	4-bit	N/A	0 – 15	1	} of
	}
	}
	}
	Run Length Code (N) (N = 1 to 13)	4-bit	N/A	1 – 13	1	} N = 1 to 13
	Data Level Code (N) (N = 1 to 13)	4-bit	N/A	0 – 15	1	}
	NULL (only nec. if #)	4-bit	N/A	0000	N/A	} rows
	NULL (runs (N)=odd)	4-bit	N/A	0000	N/A	}
	
	
	
	
O-Rate (L)	Rate Scan layer #L divider (L = 1 to 16)	INT*2	N/A	-1	N/A	OSF doc
O-Rate (L) +1 to +2	Rate Scan Layer #L length in bytes not including layer divider and layer length	INT*4	Bytes	62 to 218	1	OSF doc
O-Rate (L)	Rate Scan packet code	INT*2	N/A	18	N/A	Fig 3-11b

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
+3						
O-Rate (L) +4	Spare	INT*2	N/A	0	N/A	Fig 3-11b
O-Rate (L) +5	Spare	INT*2	N/A	0	N/A	Fig 3-11b
O-Rate (L) +6	Number of 1/4 LFM boxes in row	INT*2	N/A	13	1	Fig 3-11b
O-Rate (L) +7	Number of rows	INT*2	N/A	13	1	Fig 3-11b
O-Rate (L) +8	Row N: Number of RLE bytes in row not including this field	INT*2	Bytes	2 – 14	1	} repeat
O-Rate (L) +9	Run Length Code (1)	4-bit	N/A	1 – 13	1	}
	Data Level Code (1)	4-bit	N/A	0 – 15	1	} for
	Run Length Code (2)	4-bit	N/A	1 – 13	1	}
	Data Level Code (2)	4-bit	N/A	0 – 15	1	} each
O-Rate (L) +10	Run Length Code (3)	4-bit	N/A	1 – 13	1	}
	Data Level Code (3)	4-bit	N/A	0 – 15	1	} of
	}
	}
	}
	Run Length Code (N) (N = 1 to 13)	4-bit	N/A	1 – 13	1	} N = 1 to 13
	Data Level Code (N) (N = 1 to 13)	4-bit	N/A	0 – 15	1	}
	NULL (only nec. if #)	4-bit	N/A	0000	N/A	} rows
	NULL (runs (N)=odd)	4-bit	N/A	0000	N/A	}
	BEGINNING OF THE DPA ALPHANUMERIC LAYER (Note: Offset [0] represents the last NULL byte of Rate Scan layers)					
Offset[1]	Text layer divider	INT*2	N/A	-1	N/A	OSF doc
Offset[2] – Offset[3]	Layer length not including layer divider and layer length	INT*4	Bytes	2656 to 3856	1	OSF doc
Offset[4]	Text layer packet code	INT*2	N/A	1	N/A	Fig 3-8b
Offset[5]	Length of text layer in bytes	INT*2	Bytes	2652 to 3852	1	Fig 3-8b
Offset[6]	I Starting Point	INT*2	Km/4 or Pixels	0	1	Fig 3-8b
Offset[7]	J Starting Point	INT*2	Km/4 or Pixels	0	1	Fig 3-8b
	BEGINNING OF THE EPRE ADAPTATION DATA SUB-LAYER OF DPA ALPHANUMERIC LAYER					
Offset[8] - Offset[11]	Adaptation data header	ASCII*8	N/A	“ADAP(nn)”	N/A	Product Spec Format VII Note 1; nn (=38) is the number of adaptable params contained in this

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
						sub-layer as of ORPG Build 5
Offset[12] - Offset[15]	Width of radar beam	ASCII*8	Deg	"XXXXX.XX" (space padded) Range: 0.80 to 1.00 Default: 0.90	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
Offset[16] - Offset[19]	Blockage Threshold	ASCII*8	%	"XXXXX.XX" (space padded) Range: 0.00 to 100.00 Default: 50.00	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
Offset[20] - Offset[23]	Clutter Threshold	ASCII*8	%	"XXXXX.XX" (space padded) Range: 0.00 to 100.00 Default: 50.00	0.01	Class I Users ICD Format VII Note 1; discussions on REC performance Nov 2003
Offset[24] - Offset[27]	Weight Threshold	ASCII*8	%	"XXXXX.XX" Range: 0.00 to 100.00 Default: 50.00	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
Offset[28] - Offset[31]	Full Hybrid Scan Threshold	ASCII*8	%	"XXXXX.XX" (space padded) Range: 90.00 to 100.00 Default: 99.70	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
Offset[32] - Offset[35]	Low Reflectivity Threshold	ASCII*8	dBZ	"XXXXX.XX" (space padded) Range: -40.00 to -20.00 Default: -32.00	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
Offset[36] - Offset[39]	Rain Detection Reflectivity Threshold	ASCII*8	dBZ	"XXXXX.XX" (space padded) Range: 10.00 to 30.00 Default: 20.00	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
Offset[40] - Offset[43]	Rain Detection Area Threshold	ASCII*8	Km ²	"XXXXX.XX" (space padded) Range: 0.00 to 82800.00	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Default: 80.00		"Final" Adaptation settings 8/28/03
Offset[44] - Offset[47]	Rain Detection Time Threshold	ASCII*8	Min	"XXXXX.XX" (space padded) Range: 0.00 to 1440.00 Default: 60.00	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
Offset[48] - Offset[51]	Z-R Mult. Coef.	ASCII*8	N/A	"XXXXX.XX" (space padded) Range: 50.00 to 500.00 Default: 300.00	0.01	Class I Users ICD Format VII Note 1
Offset[52] - Offset[55]	Z-R Power Coef.	ASCII*8	N/A	"XXXXX.XX" Range: 1.00 to 2.00 Default: 1.40	0.01	Class I Users ICD Format VII Note 1
Offset[56] - Offset[59]	Min. Refl. to Convert to Rate	ASCII*8	dBZ	"XXXXX.XX" Range: -32.00 to +20.00 Default: 0.00	0.01	Class I Users ICD Format VII Note 1
Offset[60] - Offset[63]	Max. Refl. to Convert to Rate	ASCII*8	dBZ	"XXXXX.XX" (space padded) Range: 50.00 to 90.00 Default: 70.00	0.01	Class I Users ICD Format VII Note 1
Offset[64] - Offset[67]	Number of Exclusion Zones	ASCII*8	N/A	"XXXXX.XX" (space padded) Range: 0.00 to 20.00 Default: 0.00	0.01	Class I Users ICD Format VII Note 1; Dennis's email to Cheryl on "Final" Adaptation settings 8/28/03
BEGINNING OF THE RATE ALGORITHM ADAPTATION DATA SUB-LAYER OF DPA ALPHANUMERIC LAYER						
Offset[68] - Offset[71]	Max Storm Speed	ASCII*8	M/S	"XXXXX.XX" (space padded) Range: 10.00 to 40.00 Default: 25.00	0.01	
Offset[72] - Offset[75]	Thresh. Max Time Difference	ASCII*8	MIN	"XXXXX.XX" (space padded) Range: 10.00 to 30.00 Default: 15.00	0.01	
Offset[76] - Offset[79]	Min. Area Time Continuity	ASCII*8	KM**2	"XXXXX.XX" (space padded) Range: 50.00 to 1000.00 Default: 200.00	0.01	
Offset[80] - Offset[83]	Time Continuity	ASCII*8	1/HR	"XXXXX.XX"	0.01	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
	Parameter #1			(space padded) Range: 0.10 to 99.90 Default: 24.00		
Offset[84] - Offset[87]	Time Continuity Parameter #2	ASCII*8	1/HR	“XXXXX.XX” (space padded) Range: 0.10 to 99.90 Default: 13.20	0.01	
Offset[88] - Offset[91]	Max. Rate Echo Area Change	ASCII*8	KM**2/HR	“XXXXX.XX” (space padded) Range: 20.00 to 700.00 Default: 200.00	0.01	
Offset[92] - Offset[95]	Range Cut-Off	ASCII*8	KM	“XXXXX.XX” (space padded) Range: 0.00 to 230.00 Default: 230.00	0.01	
Offset[96] - Offset[99]	Range Effect Coeff. #1	ASCII*8	dBR	“XXXXX.XX” (space padded) Range: 0.00 to 3.00 Default: 0.00	0.01	
Offset[100] - Offset[103]	Range Coeff. Coeff. #2	ASCII*8	N/A	“XXXXX.XX” (space padded) Range: 1.00 to 10.00 Default: 1.00	0.01	
Offset[104] - Offset[107]	Range Coeff. Coeff. #3	ASCII*8	N/A	“XXXXX.XX” (space padded) Range: 0.00 to 1.00 Default: 0.00	0.01	
Offset[108] - Offset[111]	Min Precip. Rate for inclusion	ASCII*8	MM/HR	“XXXXX.XX” (space padded) Range: 0.00 to 10.00 Default: 0.00	0.01	
Offset[112] - Offset[115]	Max Precip. Rate allowed	ASCII*8	MM/HR	“XXXXX.XX” (space padded) Range: 50.00 to 1600.00 Default: 103.80	0.01	
BEGINNING OF THE ACCUM ALGORITHM ADAPTATION DATA SUB-LAYER OF DPA ALPHANUMERIC LAYER						
Offset[116] - Offset[119]	Thresh. Elapsed Time to Restart	ASCII*8	MIN	“XXXXX.XX” (space padded) Range: 45.00 to 60.00 Default: 60.00	0.01	
Offset[120] - Offset[123]	Max. Time for Interpolation	ASCII*8	MIN	“XXXXX.XX” (space padded)	0.01	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Range: 15.00 to 60.00 Default: 30.00		
Offset[124] - Offset[127]	Min. Time in Hourly Period	ASCII*8	MIN	“XXXXX.XX” (space padded) Range: 45.00 to 60.00 Default: 54.00	0.01	
Offset[128] - Offset[131]	Threshold Hourly Outlier	ASCII*8	MM	“XXXXX.XX” (space padded) Range: 50.00 to 800.00 Default: 400.00	0.01	
Offset[132] - Offset[135]	End Time Gage Accumulation	ASCII*8	MIN	“XXXXX.XX” (space padded) Range: 0.00 to 59.00 Default: 0.00	0.01	
Offset[136] - Offset[139]	Max Period Accum Value	ASCII*8	MM	“XXXXX.XX” (space padded) Range: 50.00 to 400.00 Default: 400.00	0.01	
Offset[140] - Offset[143]	Max Hourly Accum Value	ASCII*8	MM	“XXXXX.XX” (space padded) Range: 50.00 to 1600.00 Default: 800.00	0.01	
BEGINNING OF THE ADJUSTMENT ALGORITHM ADAPTATION DATA SUB-LAYER OF DPA ALPHANUMERIC LAYER						
Offset[144] - Offset[147]	Time Bias Estimation	ASCII*8	MIN	“XXXXX.XX” (space padded) Range: 50.00 to 59.00 Default: 50.00	0.01	
Offset[148] - Offset[151]	Thresh. No. Gage-Radar Pairs	ASCII*8	N/A	“XXXXX.XX” (space padded) Range: 6.00 to 30.00 Default: 10.00	0.01	
Offset[152] - Offset[155]	Reset Bias Value	ASCII*8	N/A	“XXXXX.XX” (space padded) Range: 0.50 to 2.00 Default: 1.00	0.01	
Offset[156] - Offset[159]	Longest Allowable Lag	ASCII*8	HOURS	“XXXXX.XX” (space padded) Range: 100.00 to 1000.00 Default: 168.00	0.01	
Offset[160] - Offset[163]	Bias Applied Flag	ASCII*8	N/A	“XXXXXXXX” (space padded) Range: T or F	N/A	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Default: F		
BEGINNING OF THE BIAS TABLE SUB-LAYER OF DPA ALPHANUMERIC LAYER						
Offset[164] - Offset[167]	Bias Table data header	ASCII*8	N/A	“BIAS(nn)”	N/A	From HSEB DPA Decoder doc; nn (=13) is the number of lines of information including header and data lines contained in this sub-layer as of ORPG Build 5
Offset[168] - Offset[207]	Bias Table Title Line 1	ASCII*80	N/A	“GAGE-RADAR MEAN FIELD BIAS TABLE “	N/A	
Offset[208] - Offset[249]	Bias Table Title Line 2	ASCII*80	N/A	“LAST BIAS UPDATE TIME: MM/DD/YY HH:MM BIAS APPLIED? XXX” Range: “YES” or “NO “ Default: NO	N/A	MM/DD/YY and HH:MM filled in appropriately
Offset[248] - Offset[287]	Bias Table Title Line 3	ASCII*80	N/A	“MSPAN (HRS) NO. G_R PAIRS AVG. GAGE(MM) AVG. RADAR(MM) MEAN FLD BIAS“	N/A	
Offset[288] - Offset[307]	Row 1: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 0.1	0.001	
	Row 1: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 1: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded)	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Range: 0.000 to 400.000 Default: 0.000		
	Row 1: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 1: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.01 to 100.0 Default: 1.000	0.001	
Offset[308] - Offset[327]	Row 2: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 1.000	0.001	
	Row 2: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 2: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 2: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 2: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.01 to 100. Default: 1.000	0.001	
Offset[328] - Offset[347]	Row 3: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 2.000	0.001	
	Row 3: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 3: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				400.000 Default: 0.000		
	Row 3: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 3: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
Offset[348] - Offset[367]	Row 4: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX XX” (space padded) Range: 0.001 to 10.**7 Default: 3.000	0.001	
	Row 4: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 4: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 4: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 4: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
Offset[368] - Offset[387]	Row 5: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX XX” (space padded) Range: 0.001 to 10.**7 Default: 5.000	0.001	
	Row 5: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 5: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Default: 0.000		
	Row 5: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 5: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
Offset[388] - Offset[407]	Row 6: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 10.000	0.001	
	Row 6: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 6: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 6: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 6: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
Offset[408] - Offset[427]	Row 7: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 168.000	0.001	
	Row 7: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 7: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
	Row 7: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 7: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
Offset[428] - Offset[447]	Row 8: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 720.000	0.001	
	Row 8: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 8: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 8: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 8: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
Offset[448] - Offset[467]	Row 9: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 2160.000	0.001	
	Row 9: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 9: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
	Row 9: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 9: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
Offset[468] - Offset[487]	Row 10: MEMORY SPAN (HOURS)	ASCII*11		“XXXXXXXX.XX” (space padded) Range: 0.001 to 10.**7 Default: 10.**7	0.001	
	Row 10: NO. G-R PAIRS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 999.999 Default: 0.000	0.001	
	Row 10: AVG. GAGE VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 10: AVG. RADAR VALUE (MM)	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 400.000 Default: 0.000	0.001	
	Row 10: MEAN-FIELD BIAS	ASCII*7		“XXX.XXX” (space padded) Range: 0.000 to 100. Default: 1.000	0.001	
BEGINNING OF THE SUPPLEMENTAL DATA SUB-LAYER OF THE DPA ALPHANUMERIC LAYER						
Offset[488] - Offset[491]	Supplemental data header	ASCII*8		“SUPL(LL)”	N/A	From HSEB DPA Decoder doc; LL is the number of elements of information which follow in the sub- layer (15 + nn as of ORPG Build 5)
Offset[492] - Offset[531]	Rate Scan 1	ASCII*80	N/A	“RATE SCAN 1 DATE: dddd TIME: tttt”	N/A	Date format is “adjusted” Julian date (number of days since Jan 1 1970) Time format is

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
						number of seconds
	
	
Offset[532]- Offset[571]	Rate Scan nn (Note: nn can range from 1 to 16)	ASCII*80	N/A	"RATE SCAN nn DATE: dddd TIME: tttt"	N/A	Date format is "adjusted" Julian date (number of days since Jan 1 1970) Time format is number of seconds
Offset[572]- Offset[611]	Hourly Accumulation End Date	ASCII*80	N/A	"HOURLY ACCUMULATI ON END DATE...: dddd"	1	Date format is "adjusted" Julian date (number of days since Jan 1 19770)
Offset[612]- Offset[651]	Hourly Accumulation End Time	ASCII*80	N/A	"HOURLY ACCUMULATI ON END TIME...: tttt"	1	Time format is number of seconds
Offset[652]- Offset[691]	Total No. of Blockage Bins Rejected	ASCII*80	N/A	"TOTAL NO. OF BLOCKAGE BINS REJECTED: xxxxxx" Range: 0 to 82800 Default: 0	1	Number is padded with spaces
Offset[692]- Offset[731]	Total No. of Clutter Bins Rejected	ASCII*80	N/A	"TOTAL NO. OF CLUTTER BINS REJECTED.: xxxxxx" Range: 0 to 82800 Default: 0	1	Number is padded with spaces
Offset[732 d]- Offset[771]	Number of Bins Smoothed	ASCII*80	N/A	"NUMBER OF BINS SMOOTHED...: xxxxxx" Range: 0 to 82800 Default: 0	1	Number is padded with spaces
Offset[772]- Offset[811]	Percent of Hybrid Scan Bins Filled	ASCII*80	%	"PERCENT OF HYBRID SCANS FILLED.: xx.xx" Range: 90.00 to 100.00 Default: 99.75	0.01	Number is padded with spaces
Offset[812]-	Highest Elevation Angle Used in Hybrid	ASCII*80	Deg	"HIGHEST ELEVATION	0.01	Number is padded with

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
Offset[851]	Scan			ANGLE USED IN HYBSCAN: xxx.xx” Range: 0.00 to 19.50 Default: 3.50		spaces
Offset[852]- Offset[891]	Total Hybrid Scan Rain Area	ASCII*80	Km ²	“TOTAL HYBRID SCAN RAIN AREA.....: xxxxx.xx” Range: 0.00 to 82800.00 Default: 80.00	0.01	Number is padded with spaces
Offset[892]- Offset[931]	Number of Bad Scans in Hour	ASCII*80	N/A	“NUMBER OF BAD SCANS IN HOUR.....: xx” Range: 0 to 16 Default: 0	1	Number is padded with spaces
Offset[932]- Offset[971]	Bias Estimate	ASCII*80	N/A	“BIAS ESTIMATE.....: x.xx” Range: 0.01 to 100.00 Default : 1.00	0.01	Number is padded with spaces
Offset[972]- Offset[101 1]	Effective No. Gage- Radar Pairs	ASCII*80	N/A	“EFFECTIVE # G/R PAIRS.....: x.xx” Range: 6.00 to 30.00 Default: 10.00	0.01	Number is padded with spaces
Offset[101 2]- Offset[105 1]	Memory Span (Hours)	ASCII*80	N/A	“MEMORY SPAN (HOURS).....: xx.xxx” Range: 0.001 to 10.**7 Default: 10.00	0.01	Number is padded with spaces
Offset[105 2]- Offset[109 1]	Current Volume Coverage Pattern	ASCII*80	N/A	“CURRENT VOLUME COVERAGE PATTERN.....: xxx” Range: 11,12, 21, 121, etc. Default: 11	1	Number is padded with spaces
Offset[109 2]- Offset[113 1]	Current Operational (Weather) Mode	ASCII*80	N/A	“CURRENT OPERATIONAL (WEATHER) MODE.: x” Range: A or B	N/A	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Default: A		
Offset[113 2]- Offset[117 1]	No Missing Periods in Current Hour	ASCII*80	N/A	"NO MISSING PERIODS IN CURRENT HOUR"		

[GRAPHIC ALPHANUMERIC BLOCK IS NOT USED BY DPA]

[TABULAR ALPHANUMERIC BLOCK IS NOT USED BY DPA]

References

"Decoding of DPA Products", published by OHD/HSEB, updated as of AWIPS Release OB3 (1/8/04)

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
(n) – (n+29)	Blank	ASCII	N/A	“ “	N/A	
(n+30) – (n+.....)	Nulls	INT*2	N/A	0	N/A	Variable number of Nulls

The following is an example of the alphanumeric layer of the DPA product, as rendered by CODE cvt.

```
ADAP(38) 0.90 50.00 50.00 50.00 99.70 -32.00 20.00 80.00 60.00 300.00 1.40 0.00 70.00 0.00
          25.00 15.00 200.00 24.00 13.20 200.00 230.00 0.00 1.00 0.00 0.00 103.80 60.00 30.00
          54.00 400.00 0.00 400.00 800.00 50.00 10.00 1.00 168.00 FBIAS(13)
```

GAGE-RADAR MEAN FIELD BIAS TABLE

```
LAST BIAS UPDATE TIME: 12/31/** 00:00          BIAS APPLIED ? NO
MSPAN (HRS)  NO. G_R PAIRS  AVG. GAGE(MM)  AVG. RADAR(MM)  MEAN FLD BIAS
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
0.000        0.000        0.000          0.000          0.000
```

```
SUPL(27) RATE SCAN 1 DATE: 9534 TIME:27072
          RATE SCAN 2 DATE: 9534 TIME:27392
          RATE SCAN 3 DATE: 9534 TIME:27776
          RATE SCAN 4 DATE: 9534 TIME:28160
          RATE SCAN 5 DATE: 9534 TIME:28480
          RATE SCAN 6 DATE: 9534 TIME:28864
```

RATE SCAN 7 DATE: 9534 TIME:29248
RATE SCAN 8 DATE: 9534 TIME:29568
RATE SCAN 9 DATE: 9534 TIME:29952
RATE SCAN 10 DATE: 9534 TIME:30272
RATE SCAN 11 DATE: 9534 TIME:30592
RATE SCAN 12 DATE: 9534 TIME:30976
HOURLY ACCUMULATION END DATE.....: 9534
HOURLY ACCUMULATION END TIME.....: 30976
TOTAL NO. OF BLOCKAGE BINS REJECTED:28305
TOTAL NO. OF CLUTTER BINS REJECTED.: 2024
NUMBER OF BINS SMOOTHED.....: 0
PERCENT OF HYBRID SCAN BINS FILLED.: 99.88
HIGHEST ELEV. ANGLE USED IN HYBSCAN: 3.40
TOTAL HYBRID SCAN RAIN AREA.....: 18304.99
NUMBER OF BAD SCANS IN HOUR.....: 0
BIAS ESTIMATE.....: 1.00
EFFECTIVE # G/R PAIR.....: 0.00
MEMORY SPAN (HOURS).....: 0.00
CURRENT VOLUME COVERAGE PATTERN....: 21
CURRENT OPERATIONAL (WEATHER) MODE.: 2
NO MISSING PERIODS IN CURRENT HOUR