Precipitation Processing System (PPS) Product Format Description

Hourly Digital Precip Array (DPA)

Change History Log		
Author	Date	Build
Kelley Miles	3/8/2005	8
Jihong Liu	3/17/2005	correction

Setting	**Value**	**Comment**
Product type	256-level digital	
Time generated	Once every volume scan	
Hourly Accumulation Data	1-hr digital data 131 x 131 array	
Rate Scan Data	¼ LFM, 13 x 13 arrays	Number of rate scan layers may vary from 1 to 16 with number of volumes scans in the hour
Alphanumeric data	Adaptable parameters Bias Table Supplemental data	
Compression	None	
AWIPS ID	WSRDPAxxx	xxx is site ID for originating WFO

Description/Purpose

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 ¼ 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	

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	
02	Date of Message	INT*2	Julian Date	1 to 32,767	1	
03-04	Time of Message	INT*4	Seconds	0 to 86,399	1	
05-06	Length of Message	INT*4	Bytes	3400 to 42266	1	
07	Source ID	INT*2	N/A	0 to 999	1	
08	Destination ID	INT*2	N/A	0 to 999	1	
09	Number of Blocks	INT*2	N/A	3	1	

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	
11-12	Latitude of Radar	INT*4	Degrees	-90 to +90	0.001	
13-14	Longitude of Radar	INT*4	Degrees	-180 to +180	0.001	
15	Height of Radar	INT*2	Feet	-100 to +11000	1	
16	Product Code	INT*2	N/A	81	N/A	
17	Operational Mode	INT*2	N/A	0 to 2	N/A	
18	Volume Coverage Pattern	INT*2	N/A	1 to 767	N/A	
19	Sequence Number	INT*2	N/A	-13, 0 to 32767	1	
20	Volume Scan Number	INT*2	N/A	1 to 80	1	
21	Volume Scan Date	INT*2	Julian Date	1 to 32767	1	
22-23	Volume Scan Start	INT*4	Seconds	0 to 86399	1	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
	Time		GMT			
24	Product Generation Date	INT*2	Julian Date	1 to 32767	1	
25-26	Product Generation Time	INT*4	Seconds	0 to 86399	1	
27	Not used	INT*2	N/A	0	N/A	
28	Not used	INT*2	N/A	0	N/A	
29	Elevation Number	INT*2	N/A	0 to 20	1	
30	Not used	INT*2	N/A	0	N/A	
31	Minimum DPA data level	INT*2	dBA	-6.0	0.1	
32	Data level increment	INT*2	dBA	.125	0.001	
33	Number of data levels	INT*2	N/A	256	1	
34	Not used	INT*2	N/A	0	N/A	
35	Not used	INT*2	N/A	0	N/A	
36	Not used	INT*2	N/A	0	N/A	
37	Not used	INT*2	N/A	0	N/A	
38	Not used	INT*2	N/A	0	N/A	
39	Not used	INT*2	N/A	0	N/A	
40	Not used	INT*2	N/A	0	N/A	
41	Not used	INT*2	N/A	0	N/A	
42	Not used	INT*2	N/A	0	N/A	
43	Not used	INT*2	N/A	0	N/A	
44	Not used	INT*2	N/A	0	N/A	
45	Not used	INT*2	N/A	0	N/A	
46	Not used	INT*2	N/A	0	N/A	
47	Maximum Rainfall accum	INT*2	dBA	0; -6.0 to 25.625	0.125	
48	Mean field bias	INT*2	N/A	.01 to 99.99	0.01	
49	Effective Number G-R pairs (sample size)	INT*2	N/A	.00 to 9999.99	0.01	
50	Hourly accum End Date	INT*2	Julian Date	1 to 32767	1	
51	Hourly accum End Time	INT*2	Minutes	0 to 1439	1	
52	Not used	INT*2	N/A	0	N/A	
53	Not used	INT*2	N/A	0	N/A	
54	Version	INT*1	N/A	0 to 2	1	
54	Spot Blank	INT*1	N/A	0 to 1	1	
55-56	Offset to Product Symbology block	INT*4	Half-words	60	1	
57-58	Offset to Graphic Alphanumeric block	INT*4	Half-words	0	1	
59-60	Offset to Tabular Alphanumeric block	INT*4	Half-words	0	1	

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	
62	Block ID	INT*2	N/A	1	N/A	
63-64	Length of Block	INT*4	Bytes	3280 to 42146	1	
65	Number of Layers	INT*2	N/A	3 to 18	1	
	BEGINNING OF THE DPA HOURLY DATA LAYER					
66	Digital Data Layer Divider	INT*2	N/A	-1	N/A	
67-68	Length of Data Layer in bytes not including layer divider and layer length	INT*4	Bytes	534 to 34594	1	
69	Packet Code	INT*2	N/A	17	N/A	
70	Spare	INT*2	N/A	0	N/A	
71	Spare	INT*2	N/A	0	N/A	
72	Number of 1/40 LFM boxes in row	INT*2	N/A	131	1	
73	Number of rows	INT*2	N/A	131	1	
	Following is a fixed 131 x 131 array of INT*2 elements, run-length encoded. Run/data level byte values are set to 0 when any runs are not used. 0 is for no accumulation; 255 is for data outside the coverage area. Data values may be converted to rainfall amount by: DBA = -6.125 + (data level code) *0.125 RAINFALL (mm) = 10 ** (0.1*DBA)					
74	Row 1: Number of RLE bytes in row not including this field	INT*2	Bytes	2 to 262	1	
75	Row 1: Run Length Code (1)	INT*1	N/A	1 to 131	1	
	Row 1: Data Level Code (1)	INT*1	N/A	0 to 255	1	
…	…	…	…	…	…	
…	…	…	…	…	…	
…	…	…	…	…	…	
(74 + N)	Row 1: Run Length Code N (N = 1 to 131)	INT*1	N/A	1 to 131	1	
	Row 1: Data Level	INT*1	N/A	0 to 255	1	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
	Code N (N = 1 to 131)					
(74 + N+1)	Row 2: Number of RLE bytes in row not including this field	INT*2	Bytes	2 to 262	1	
(74 + N+2)	Row 2: Run Length Code (1)	INT*1	N/A	1 to 131	1	
	Row 2: Data Level Code (1)	INT*1	N/A	0 to 255	1	
…	…	…	…	…	…	
…	…	…	…	…	…	
…	…	…	…	…	…	
	Row 2: Run Length Code N (N = 1 to 131)	INT*1	N/A	1 to 131	1	
	Row 2: Data Level Code N (N = 1 to 131)	INT*1	N/A	0 to 255	1	
…	…	…	…	…	…	
…	…	…	…	…	…	
…	…	…	…	…	…	
…	…	…	…	…	…	
…	…	…	…	…	…	
	Row 131: Number of RLE bytes in row not including this field	INT*2	Bytes	2 to 262	1	
	Row 131: Run Length Code (1)	INT*1	N/A	1 to 131	1	
	Row 131: Data Level Code (1)	INT*1	N/A	0 to 255	1	
…	…	…	…	…	…	
…	…	…	…	…	…	
…	…	…	…	…	…	
	Row 131: Run Length Code N (N = 1 to 131)	INT*1	N/A	1 to 131	1	
	Row 131: Data Level Code N (N = 1 to 131)	INT*1	N/A	0 to 255	1	
	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	
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	
O-Rate +3	Rate Scan packet code	INT*2	N/A	18	N/A	
O-Rate +4	Spare	INT*2	N/A	0	N/A	
O-Rate +5	Spare	INT*2	N/A	0	N/A	
O-Rate +6	Number of 1/4 LFM boxes in row	INT*2	N/A	13	1	
O-Rate +7	Number of rows	INT*2	N/A	13	1	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
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	
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	
O-Rate (L) +3	Rate Scan packet code	INT*2	N/A	18	N/A	
O-Rate (L) +4	Spare	INT*2	N/A	0	N/A	
O-Rate (L) +5	Spare	INT*2	N/A	0	N/A	
O-Rate (L) +6	Number of 1/4 LFM boxes in row	INT*2	N/A	13	1	
O-Rate (L) +7	Number of rows	INT*2	N/A	13	1	
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
	…	….	…	…	…	}
	…	…	…	…	…	}

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
	…	…	…	…	…	}
	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	
Offset[2] – Offset[3]	Layer length not including layer divider and layer length	INT*4	Bytes	2656 to 3856	1	
Offset[4]	Text layer packet code	INT*2	N/A	1	N/A	
Offset[5]	Length of text layer in bytes	INT*2	Bytes	2652 to 3852	1	
Offset[6]	I Starting Point	INT*2	Km/4 or Pixels	0	1	
Offset[7]	J Starting Point	INT*2	Km/4 or Pixels	0	1	
	BEGINNING OF THE EPRE ADAPTATION DATA SUB-LAYER OF DPA ALPHANUMERIC LAYER					
Offset[8] - Offset[11]	Adaptation data header	CHAR*8	N/A	"ADAP(32)"	N/A	CCR**#NA04-32201**
Offset[12 - Offset[15]	Width of radar beam	CHAR*8	Deg	"XXXXX.XX" (space padded) Range: 0.80 to 1.00 Default: 0.90	0.01	
Offset[16] - Offset[19]	Blockage Threshold	CHAR*8	%	"XXXXX.XX" (space padded) Range: 0.00 to 100.00 Default: 50.00	0.01	
Offset[20] - Offset[23]	Clutter Threshold	CHAR*8	%	"XXXXX.XX" (space padded) Range: 0.00 to 100.00 Default: 50.00	0.01	
Offset[24] - Offset[27]	Weight Threshold	CHAR*8	%	"XXXXX.XX" Range: 0.00 to 100.00 Default: 50.00	0.01	
Offset[28] - Offset[31]	Full Hybrid Scan Threshold	CHAR*8	%	"XXXXX.XX" (space padded) Range: 90.00 to 100.00 Default: 99.70	0.01	
Offset[32] -	Low Reflectivity	CHAR*8	dBZ	"XXXXX.XX"	0.01	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
Offset[35]	Threshold			(space padded) Range: -40.00 to -20.00 Default: -32.00		
Offset[36] - Offset[39]	Rain Detection Reflectivity Threshold	CHAR*8	dBZ	"XXXXX.XX" (space padded) Range: 10.00 to 30.00 Default: 20.00	0.01	
Offset[40 - Offset[43]	Rain Detection Area Threshold	CHAR*8	Km^2	"XXXXX.XX" (space padded) Range: 0.00 to 82800.00 Default: 80.00	0.01	
Offset[44] - Offset[47]	Rain Detection Time Threshold	CHAR*8	Min	"XXXXX.XX" (space padded) Range: 0.00 to 1440.00 Default: 60.00	0.01	
Offset[48] - Offset[51]	Z-R Mult. Coef.	CHAR*8	N/A	"XXXXX.XX" (space padded) Range: 50.00 to 500.00 Default: 300.00	0.01	
Offset[52] - Offset[55]	Z-R Power Coef.	CHAR*8	N/A	"XXXXX.XX" Range: 1.00 to 2.00 Default: 1.40	0.01	
Offset[56] - Offset[59]	Min. Refl. to Convert to Rate	CHAR*8	dBZ	"XXXXX.XX" Range: -32.00 to +20.00 Default: 0.00	0.01	
Offset[60 - Offset[63]	Max. Refl. to Convert to Rate	CHAR*8	dBZ	"XXXXX.XX" (space padded) Range: 50.00 to 90.00 Default: 70.00	0.01	
Offset[64] - Offset[67]	Number of Exclusion Zones	CHAR*8	N/A	"XXXXX.XX" (space padded) Range: 0.00 to 20.00 Default: 0.00	1.00	Correction to original description (no format change)
	BEGINNING OF THE RATE ALGORITHM ADAPTATION DATA SUB-LAYER OF DPA ALPHANUMERIC LAYER					
~~Offset[68] - Offset[71]~~	~~Max Storm Speed~~	~~CHAR*8~~	~~M/S~~	~~"XXXXX.XX" (space padded)~~ ~~Range: 10.00 to 40.00~~ ~~Default: 25.00~~	~~0.01~~	CCR**#NA04-32201**
~~Offset[72] - Offset[75]~~	~~Thresh. Max Time Difference~~	~~CHAR*8~~	~~MIN~~	~~"XXXXX.XX" (space padded)~~ ~~Range: 10.00 to 30.00~~	~~0.01~~	CCR**#NA04-32201**

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
				~~Default: 15.00~~		
~~Offset[76] - Offset[79]~~	~~Min. Area Time Continuity~~	~~CHAR*8~~	~~KM**2~~	~~"XXXXX.XX" (space padded) Range: 50.00 to 1000.00 Default: 200.00~~	~~0.01~~	CCR#**NA04-32201**
~~Offset[80] - Offset[83]~~	~~Time Continuity Parameter #1~~	~~CHAR*8~~	~~1/HR~~	~~"XXXXX.XX" (space padded) Range: 0.10 to 99.90 Default: 24.00~~	~~0.01~~	CCR#**NA04-32201**
~~Offset[84] - Offset[87]~~	~~Time Continuity Parameter #2~~	~~CHAR*8~~	~~1/HR~~	~~"XXXXX.XX" (space padded) Range: 0.10 to 99.90 Default: 13.20~~	~~0.01~~	CCR#**NA04-32201**
~~Offset[88] - Offset[91]~~	~~Max. Rate Echo Area Change~~	~~CHAR*8~~	~~KM**2/HR~~	~~"XXXXX.XX" (space padded) Range: 20.00 to 700.00 Default: 200.00~~	~~0.01~~	CCR#**NA04-32201**
Note: as a result of implementing this CCR the halfword addresses of all remaining fields have changed						
Offset[68] - Offset[71]	Range Cut-Off	CHAR*8	KM	"XXXXX.XX" (space padded) Range: 0.00 to 230.00 Default: 230.00	1.00	Correction to original description (no format change)
Offset[72] - Offset[75]	Range Effect Coeff. #1	CHAR*8	dBR	"XXXXX.XX" (space padded) Range: 0.00 to 3.00 Default: 0.00	0.10	Correction to original description (no format change)
Offset[76] - Offset[79]	Range Coeff. Coeff. #2	CHAR*8	dBR	"XXXXX.XX" (space padded) Range: 1.00 to 10.00 Default: 1.00	0.10	Correction to original description (no format change)
Offset[80] - Offset[83]	Range Coeff. Coeff. #3	CHAR*8	dBR	"XXXXX.XX" (space padded) Range: 0.00 to 1.00 Default: 0.00	0.10	Correction to original description (no format change)
Offset[84] - Offset[87]	Min Precip. Rate for inclusion	CHAR*8	MM/HR	"XXXXX.XX" (space padded) Range: 0.00 to 10.00 Default: 0.00	0.10	Correction to original description (no format change)
Offset[88] - Offset[91]	Max Precip. Rate allowed	CHAR*8	MM/HR	"XXXXX.XX" (space padded) Range: 50.00 to 1600.00 Default: 103.80	0.10	Correction to original description (no format change)
	BEGINNING OF THE ACCUM ALGORITHM ADAPTATION DATA SUB-LAYER					

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
	OF DPA ALPHANUMERIC LAYER					
Offset[92] - Offset[95]	Thresh. Elapsed Time to Restart	CHAR*8	MIN	"XXXXX.XX" (space padded) Range: 45.00 to 60.00 Default: 60.00	1.00	Correction to original description (no format change)
Offset[96] - Offset[99]	Max. Time for Interpolation	CHAR*8	MIN	"XXXXX.XX" (space padded) Range: 15.00 to 60.00 Default: 30.00	1.00	Correction to original description (no format change)
Offset[100] - Offset[103]	Min. Time in Hourly Period	CHAR*8	MIN	"XXXXX.XX" (space padded) Range: 0.00 to 60.00 Default: 54.00	1.00	Corrections to original description (no format change)
Offset[104] - Offset[107]	Threshold Hourly Outlier	CHAR*8	MM	"XXXXX.XX" (space padded) Range: 50.00 to 800.00 Default: 400.00	1.00	Correction to original description (no format change)
Offset[108] - Offset[111]	End Time Gage Accumulation	CHAR*8	MIN	"XXXXX.XX" (space padded) Range: 0.00 to 59.00 Default: 0.00	1.00	Correction to original description (no format change)
Offset[112] - Offset[115]	Max Period Accum Value	CHAR*8	MM	"XXXXX.XX" (space padded) Range: 50.00 to 400.00 Default: 400.00	1.00	Correction to original description (no format change)
Offset[116] - Offset[119]	Max Hourly Accum Value	CHAR*8	MM	"XXXXX.XX" (space padded) Range: 50.00 to 1600.00 Default: 800.00	1.00	Correction to original description (no format change)
	BEGINNING OF THE ADJUSTMENT ALGORITHM ADAPTATION DATA SUB-LAYER OF DPA ALPHANUMERIC LAYER					
Offset[120] - Offset[123]	Time Bias Estimation	CHAR*8	MIN	"XXXXX.XX" (space padded) Range: 50.00 to 59.00 Default: 50.00	1.00	Correction to original description (no format change)
Offset[124] - Offset[127]	Thresh. No. Gage-Radar Pairs	CHAR*8	N/A	"XXXXX.XX" (space padded) Range: 6.00 to 30.00 Default: 10.00	1.00	Correction to original description (no format change)
Offset[128] - Offset[131]	Reset Bias Value	CHAR*8	N/A	"XXXXX.XX" (space padded) Range: 0.50 to 2.00 Default: 1.00	0.10	Correction to original description (no format change)

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
Offset[132] - Offset[135]	Longest Allowable Lag	CHAR*8	HRS	"XXXXX.XX" (space padded) Range: 100.00 to 1000.00 Default: 168.00	1.00	Correction to original description (no format change)
Offset[136] - Offset[139]	Bias Applied Flag	CHAR*8	N/A	"XXXXXXXX" (space padded) Range: T or F Default: F	N/A	
Offset[140] – Offset[163]	Blank	CHAR*24	N/A	N/A	N/A	Space left after removal of six fields for TCT Removal (CCR**#NA04-32201)**
	BEGINNING OF THE BIAS TABLE SUB-LAYER OF DPA ALPHANUMERIC LAYER					
Offset[164] - Offset[167]	Bias Table data header	CHAR*8	N/A	"BIAS(13)"	N/A	Correction to original description (no format change)
Offset[168] - Offset[207]	Bias Table Title Line 1	CHAR*80	N/A	"GAGE-RADAR MEAN FIELD BIAS TABLE "	N/A	
Offset[208] - Offset[249]	Bias Table Title Line 2	CHAR*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	CHAR*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)	CHAR*12	HRS	"XXXXXXXX.XXX" (space padded) Range: 0.001 to 10.**7	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
	Row 1: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 1: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 1: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 1: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[308] - Offset[327]	Row 2: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 2: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 2: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 2: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 2: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[328] - Offset[347]	Row 3: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 3: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 3: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 3: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
				400.000		
	Row 3: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[348] - Offset[367]	Row 4: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 4: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 4: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 4: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 4: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[368] - Offset[387]	Row 5: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 5: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 5: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 5: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 5: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[388] - Offset[407]	Row 6: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 6: NO. G-R	CHAR*16	N/A	"XXXXXXXXX	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
	PAIRS			XXX.XXX" Range: 0.000 to 999.999		
	Row 6: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 6: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 6: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[408] - Offset[427]	Row 7: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 7: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 7: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 7: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 7: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[428] - Offset[447]	Row 8: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 8: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 8: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 8: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
	Row 8: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[448] - Offset[467]	Row 9: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 9: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 9: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 9: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 9: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
Offset[468] - Offset[487]	Row 10: MEMORY SPAN (HOURS)	CHAR*12	HRS	"XXXXXXXX.XXX" Range: 0.001 to 10.**7	0.001	
	Row 10: NO. G-R PAIRS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" Range: 0.000 to 999.999	0.001	
	Row 10: AVG. GAGE VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 10: AVG. RADAR VALUE (MM)	CHAR*16	MM	"XXXXXXXXXXXX.XXX" Range: 0.000 to 400.000	0.001	
	Row 10: MEAN-FIELD BIAS	CHAR*16	N/A	"XXXXXXXXXXXX.XXX" (4 space padded) Range: 0.001 to 100.0	0.001	
	BEGINNING OF THE SUPPLEMENTAL DATA SUB-LAYER OF THE DPA ALPHANUMERIC LAYER					
Offset[488] - Offset[491]	Supplemental data header	CHAR*8	N/A	"SUPL(nn)"	N/A	nn is variable that depends on the houly rate scan
Offset[492]	Rate Scan 1	CHAR*80	N/A	"RATE SCAN	N/A	Date format is

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
-Offset[531]				1 DATE: dddd TIME: ttttt"		"adjusted" Julian date (number of days since Jan 1 1970) Time format is number of seconds
	…	…	…	…	…	
	…	…	…	…	…	
Offset[532]-Offset[571]	Rate Scan nn (Note: nn can range from 1 to 16)	CHAR*80	N/A	"RATE SCAN nn DATE: dddd TIME: ttttt"	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	CHAR*80	N/A	"HOURLY ACCUMULATION END DATE…: dddd"	1	Date format is "adjusted" Julian date (number of days since Jan 1 1970)
Offset[612]-Offset[651]	Hourly Accumulation End Time	CHAR*80	N/A	"HOURLY ACCUMULATION END TIME…: ttttt"	1	Time format is number of seconds
Offset[652]-Offset[691]	Total No. of Blockage Bins Rejected	CHAR*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	CHAR*80	N/A	"TOTAL NO. OF CLUTTER BINS REJECTED.: xxxxxx" Range: 0 to 82800 Default: 0	1	Number is padded with spaces
Offset[732d]-Offset[771]	Number of Bins Smoothed	CHAR*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	CHAR*80	%	"PERCENT OF HYBRID SCANS FILLED.: xx.xx"	0.01	Number is padded with spaces

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
				Range: 90.00 to 100.00 Default: 99.70		Correction to original description (no format change)
Offset[812]-Offset[851]	Highest Elevation Angle Used in Hybrid Scan	CHAR*80	Deg	"HIGHEST ELEVATION ANGLE USED IN HYBSCAN: xxx.xx" Range: 0.00 to 19.50 Default: 3.50	0.01	Number is padded with spaces
Offset[852]-Offset[891]	Total Hybrid Scan Rain Area	CHAR*80	Km^2	"TOTAL HYBRID SCAN RAIN AREA……..: xxxxxx.x" Range: 0.0 to 166190.3 Default: 80.0	0.1	Number is padded with spaces CCR #**NA04-27811**
Offset[892]-Offset[931]	Number of Bad Scans in Hour	CHAR*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	CHAR*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[1011]	Effective No. Gage-Radar Pairs	CHAR*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[1012]-Offset[1051]	Memory Span (Hours)	CHAR*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[1052]-Offset[1091]	Current Volume Coverage Pattern	CHAR*80	N/A	"CURRENT VOLUME COVERAGE PATTERN….: xxx" Range: 11,12, 21, 121, etc.	1	Number is padded with spaces

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ ACCURACY	NOTES
				Default: 11		
Offset[1092]-Offset[1131]	Current Operational (Weather) Mode	CHAR*80	N/A	"CURRENT OPERATIONAL (WEATHER) MODE.: x" Range: A or B Default: A	N/A	
Offset[1132]-Offset[1171]	No Missing Periods in Current Hour	CHAR*80	N/A	"NO MISSING PERIODS IN CURRENT HOUR"	N/A	Correction to original description (no format change)

[GRAPHIC ALPHANUMERIC BLOCK IS NOT USED BY DPA]

[TABULAR ALPHANUMERIC BLOCK IS NOT USED BY DPA]

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

```
ADAP(32)     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     3.00   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        T                                                        BIAS(13)
                       GAGE-RADAR MEAN FIELD BIAS TABLE
LAST BIAS UPDATE TIME:  10/09/03 00:03                        BIAS APPLIED ?  YES
  MSPAN (HRS)    NO. G_R PAIRS   AVG. GAGE(MM)   AVG. RADAR(MM)   MEAN FLD BIAS
       0.001            0.000           1.016           1.090           0.932
       1.000            0.000           1.863           1.538           1.211
       2.000            0.000           2.648           1.933           1.370
       3.001            0.000           2.825           2.032           1.391
       4.998            0.000           2.908           2.089           1.392
      10.004            0.000           2.935           2.118           1.386
     168.006           13.494           2.627           2.094           1.255
     719.819          126.212           2.417           2.104           1.149
    2160.295          212.154           2.381           2.109           1.129
 9999044.000          277.982           2.365           2.112           1.120
SUPL(31)RATE SCAN  1 DATE:  12335 TIME: 3520
        RATE SCAN  2 DATE:  12335 TIME: 3776
        RATE SCAN  3 DATE:  12335 TIME: 4032
        RATE SCAN  4 DATE:  12335 TIME: 4288
        RATE SCAN  5 DATE:  12335 TIME: 4544
        RATE SCAN  6 DATE:  12335 TIME: 4800
        RATE SCAN  7 DATE:  12335 TIME: 5120
        RATE SCAN  8 DATE:  12335 TIME: 5376
        RATE SCAN  9 DATE:  12335 TIME: 5632
        RATE SCAN 10 DATE:  12335 TIME: 5888
        RATE SCAN 11 DATE:  12335 TIME: 6144
        RATE SCAN 12 DATE:  12335 TIME: 6400
        RATE SCAN 13 DATE:  12335 TIME: 6656
        RATE SCAN 14 DATE:  12335 TIME: 6912
        RATE SCAN 15 DATE:  12335 TIME: 7168
        RATE SCAN 16 DATE:  12335 TIME: 7424
```

```
HOURLY ACCUMULATION END DATE.......:   12335
HOURLY ACCUMULATION END TIME.......:    7200
TOTAL NO. OF BLOCKAGE BINS REJECTED:       0
TOTAL NO. OF CLUTTER BINS REJECTED.:    8578
NUMBER OF BINS SMOOTHED............:       0
PERCENT OF HYBRID SCAN BINS FILLED.:   99.88
HIGHEST ELEV. ANGLE USED IN HYBSCAN:    2.40
TOTAL HYBRID SCAN RAIN AREA........: 42459.1
NUMBER OF BAD SCANS IN HOUR........:       0
BIAS ESTIMATE......................:    1.25
EFFECTIVE # G/R PAIR...............:   13.49
MEMORY SPAN (HOURS)................:  168.01
CURRENT VOLUME COVERAGE PATTERN....:      12
CURRENT OPERATIONAL (WEATHER) MODE.:       2
NO MISSING PERIODS IN CURRENT HOUR
```