

Precipitation Processing System (PPS) Product Format Description

Digital Storm-Total Precipitation (DSP) Product

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

Setting	Value	Comment
Product type	256-data level	
Time generated	Once every volume scan	
Product size	44628	
Compression	Yes	
Resolution	2-km x 1-deg polar grid	
AWIPS ID	WSRDSPxxx	xxx is site ID for originating WFO

Description/Purpose

The basic output units are of .01" resolution, scaled as a function of the maximum data value in the output grid as follows: if the max data value is less than or equal to 2.55", the scaling factor (or increment between data values) is .01"; if the max data value exceeds 2.55" but is less than or equal to 5.10", the scaling factor is .02"; if the max data value exceeds (2 x 2.55") but is less than or equal to (3 x 2.55"), the scaling factor is .03"; etc. Level code 0 will correspond to no accumulation and level code 255 will indicate missing data. Level codes 1 through 250 will indicate accumulations, with a minimal step of 0.01 inches. For every multiple of 2.50 inches exceeded, the scale will increment by a corresponding integer multiple.

The DSP product will also generate an appended layer of ASCII data containing ancillary information such as present adaptation data settings and supplemental results determined during the algorithm processing.

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

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

[Note: (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	138	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	N/A	44628	1	CCR#NA04-32201
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)

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	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
16	Product Code	INT*2	N/A	138	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 Time	INT*4	Seconds GMT	0 to 86399	1	
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	Scan Beginning Date	INT*2	Julian Date	1 to 32767	1	
28	Scan Beginning Time	INT*2	Seconds	0 to 86399	1	
29	Elevation Number	INT*2	N/A	0 to 20	1	
30	Mean-Field Bias	INT*2	N/A	.01-100.	0.01	
31	Minimum DSP data level	INT*2	N/A	0	1	
32	Data Level Scaled Factor	INT*2	N/A	0.01 to 1.29	0.01	
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 Precip. Value	INT*2	Inch	0.0 to 327.6	0.1	Correction to original

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
						description (no format change)
48	Scan Ending Date	INT*2	Julian Date	1 to 32767	1	
49	Scan Ending Time	INT*2	Minutes	1 – 1439	1	
50	Effective Number G-R pairs (sample size)	INT*2	N/A	.00 to 9999.99	0.01	
51	Not Used	INT*2	N/A	0	N/A	
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	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 Attributes block	INT*4	Half-words	0	1	
59-60	Offset to Graphic 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 3-11c “Digital Radial Data Array Packet”

2620003 (ICD for Product Specification):

Appendix C, Format VIII “DSP and”

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	44508	1	CCR#NA04-32201

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
65	Number of Layers	INT*2	N/A	2	1	
66	Layer Divider	INT*2	N/A	-1	N/A	
67-68	Length of Data Layer not including layer divider and layer length	INT*4	N/A	43934	1	
BEGINNING OF THE DSP DATA LAYER						
69	Packet Code	INT*2	N/A	16	N/A	
70	Index of First Range Bin	INT*2	N/A	0	1	
71	Number of Range Bins	INT*2	N/A	116	1	
72	I Center of Sweep	INT*2	N/A	0	1	
73	J Center of Sweep	INT*2	N/A	0	1	
74	Range Scale Factor (116/#Bins)	Scaled Integer	N/A	2.0	0.001	
75	Number of Radials	INT*2	N/A	360	1	
76	Number of Bytes in Radial	INT*2	N/A	116	1	}Repeat }for
77	Radial Start Angle	Scaled Integer	Degrees	0.0 to 359.9	0.1	}
78	Radial Delta Angle	Scaled Integer	Degrees	1.0	0.1	}Each }
79	Level 0	INT*1	N/A	0 to 255	1	}
	Level 1	INT*1	N/A	0 to 255	1	}
80	Level 2	INT*1	N/A	0 to 255	1	}
	Level 3	INT*1	N/A	0 to 255	1	}
...	}
...	}
136	Level (N-1)	INT*1	N/A	0 to 255	1	}
	Level (N)	INT*1	N/A	0 to 255	1	}Row
...	
...	...	...	...	...	...	}Between
...	}
...	...	...	...	...	...	}Radial 2
22035	Level(N-1)	INT*1	N/A	0 to 255	1	}And
	Level(N)	INT*1	N/A	0 to 255	1	}Radial 360
BEGINNING OF THE DSP ALPHANUMERIC LAYER						

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
22036	Text layer divider	INT*2	N/A	-1	N/A	
22037-22038	Layer length not including layer divider and layer length	INT*4	N/A	552	1	CCR#NA04-32201
22039	Text layer packet code	INT*2	N/A	1	N/A	
22040	Length of text layer in bytes	INT*2	N/A	548	1	CCR#NA04-32201
22041	I Starting Point	INT*2	Km/4 or Pixels	0	1	
22042	J Starting Point	INT*2	Km/4 or Pixels	0	1	
BEGINNING OF PRECIP STATUS MESSAGE SUB-LAYER OF DSP ALPHANUMERIC LAYER						
22043-22046	Precip Status Message (PSM) header	CHAR*8	N/A	“PSM(6)” (space padded)	N/A	Correction to original description (no format change)
22047-22050	Current Date Precip Function Ran	CHAR*8	JULIAN DAYS	0 – 99999	1	
22051-22054	Current Time Precip Function Ran	CHAR*8	SEC	0 – 86399	1	
22055-22058	Last Date Precip Detected	CHAR*8	JULIAN DAYS	0 – 99999	1	
22059-22062	Last Time Precip Detected	CHAR*8	SEC	0 – 86399	1	
22063-22066	Current Precip Category	CHAR*8	N/A	0 to 2	1	Correction to original description (no format change)
22067-22070	Previous Precip Category	CHAR*8	N/A	0 to 2	1	Correction to original description (no format change)

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
	BEGINNING OF THE EPRE ADAPTATION DATA SUB-LAYER OF DSP ALPHANUMERIC LAYER					
22071-22074	Adaptation data header	CHAR* 8	N/A	“ADAP(32)”	N/A	CCR#NA04-32201
22075-22078	Width of radar beam	CHAR* 8	Deg	“XXXXXX.XX” (space padded) Range: 0.80 to 1.00 Default: 0.90	0.01	
22079-22082	Blockage Threshold	CHAR* 8	%	“XXXXXX.XX” (space padded) Range: 0.00 to 100.00 Default: 50.00	0.01	
22083-22086	Clutter Threshold	CHAR* 8	%	“XXXXXX.XX” (space padded) Range: 0.00 to 100.00 Default: 50.00	0.01	
22087-22090	Weight Threshold	CHAR* 8	%	“XXXXXX.XX” Range: 0.00 to 100.00 Default: 50.00	0.01	
22091-22094	Full Hybrid Scan Threshold	CHAR* 8	%	“XXXXXX.XX” (space padded) Range: 90.00 to 100.00 Default: 99.70	0.01	
22095-22098	Low Reflectivity Threshold	CHAR* 8	dBZ	“XXXXXX.XX” (space padded)	0.01	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Range: -40.00 to -20.00 Default: - 32.00		
22099- 22102	Rain Detection Reflectivity Threshold	CHAR* 8	dBZ	“XXXXXX.XX ” (space padded) Range: 10.00 to 30.00 Default: 20.00	0.01	
22103- 22106	Rain Detection Area Threshold	CHAR* 8	Km ²	“XXXXXX.XX ” (space padded) Range: 0.00 to 82800.00 Default: 80.00	0.01	
22107- 22110	Rain Detection Time Threshold	CHAR* 8	MINS	“XXXXXX.XX ” (space padded) Range: 0.00 to 1440.00 Default: 60.00	0.01	Correction to original description (no format change)
22111- 22114	Z-R Mult. Coef.	CHAR* 8	N/A	“XXXXXX.XX ” (space padded) Range: 50.00 to 500.00 Default: 300.00	0.01	
22115- 22118	Z-R Power Coef.	CHAR* 8	N/A	“XXXXXX.XX ” Range: 1.00 to 2.00 Default: 1.40	0.01	

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
22119-22122	Min. Refl. To Convert to Rate	CHAR* 8	dBZ	“XXXXXX.XX” Range: -32.00 to +20.00 Default: 0.00	0.01	
22123-22126	Max. Refl. to Convert to Rate	CHAR* 8	dBZ	“XXXXXX.XX” (space padded) Range: 50.00 to 90.00 Default: 70.00	0.01	
22127-22130	Number of Exclusion Zones	CHAR* 8	N/A	“XXXXXX.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 DSP ALPHANUMERIC LAYER						
22131-22134	Max Storm Speed	CHAR* 8	M/S	“XXXXXX.XX” (space padded) Range: 10.00 to 40.00 Default: 25.00	0.01	CCR#NA04-32201
22135-22138	Thresh. Max Time Difference	CHAR* 8	MINS	“XXXXXX.XX” (space padded) Range: 10.00 to 30.00 Default: 15.00	0.01	CCR#NA04-32201
22139-22142	Min. Area Time Continuity	CHAR* 8	KM**2	“XXXXXX.XX” (space padded) Range: 50.00	0.01	CCR#NA04-32201

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				to 1000.00 Default: 200.00		
22143- 22146	Time Continuity Parameter #1	CHAR* 8	1/HR	“XXXXXX.XX ” (space padded) Range: 0.10 to 99.90 Default: 24.00	0.01	CCR#NA04- 32201
22147- 22150	Time Continuity Parameter #2	CHAR* 8	1/HR	“XXXXXX.XX ” (space padded) Range: 0.10 to 99.90 Default: 13.20	0.01	CCR#NA04- 32201
22151- 22154	Max. Rate Echo Area Change	CHAR* 8	KM**2/H R	“XXXXXX.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						
22131- 22134	Range Cut-Off	CHAR* 8	KM	“XXXXXX.XX ” (space padded) Range: 0.00 to 230.00 Default: 230.00	1.00	Correction to original description (no format change)
22135- 22138	Range Effect Coeff. #1	CHAR* 8	dBR	“XXXXXX.XX ” (space padded)	0.10	Corrections to original description (no format

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				Range: 0.00 to 3.00 Default: 0.00		change)
22139- 22142	Range Coeff. Coeff. #2	CHAR* 8	dBR	“XXXXX.XX ” (space padded) Range: 1.00 to 10.00 Default: 1.00	0.10	Corrections to original description (no format change)
22143- 22146	Range Coeff. Coeff. #3	CHAR* 8	dBR	“XXXXX.XX ” (space padded) Range: 0.00 to 1.00 Default: 0.00	0.10	Corrections to original description (no format change)
22147- 22150	Min Precip. Rate for inclusion	CHAR* 8	MM/HR	“XXXXX.XX ” (space padded) Range: 0.00 to 10.00 Default: 0.00	0.10	Corrections to original description (no format change)
22151- 22154	Max Precip. Rate allowed	CHAR* 8	MM/HR	“XXXXX.XX ” (space padded) Range: 50.00 to 1600.00 Default: 103.80	0.10	Corrections to original description (no format change)
BEGINNING OF THE ACCUM ALGORITHM ADAPTATION DATA SUB-LAYER OF DSP ALPHANUMERIC LAYER						
22155- 22158	Thresh. Elapsed Time to Restart	CHAR* 8	MINS	“XXXXX.XX ” (space padded) Range: 45.00	1.00	Corrections to original description (no format change)

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				to 60.00 Default: 60.00		
22159- 22162	Max. Time for Interpolation	CHAR* 8	MINS	“XXXXX.XX ” (space padded) Range: 15.00 to 60.00 Default: 30.00	1.00	Corrections to original description (no format change)
22163- 22166	Min. Time in Hourly Period	CHAR* 8	MINS	“XXXXX.XX ” (space padded) Range: 0.00 to 60.00 Default: 54.00	1.00	Corrections to original description (no format change)
22167- 22170	Threshold Hourly Outlier	CHAR* 8	MM	“XXXXX.XX ” (space padded) Range: 50.00 to 800.00 Default: 400.00	1.00	Corrections to original description (no format change)
22171- 22174	End Time Gage Accumulation	CHAR* 8	MINS	“XXXXX.XX ” (space padded) Range: 0.00 to 59.00 Default: 0.00	1.00	Corrections to original description (no format change)
22175- 22178	Max Period Accum Value	CHAR* 8	MM	“XXXXX.XX ” (space padded) Range: 50.00 to 400.00 Default:	1.00	Corrections to original description (no format change)

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				400.00		
22179-22182	Max Hourly Accum Value	CHAR* 8	MM	“XXXXX.XX” (space padded) Range: 200.00 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 DSP ALPHANUMERIC LAYER						
22183-22186	Time Bias Estimation	CHAR* 8	MINS	“XXXXX.XX” (space padded) Range: 50.00 to 59.00 Default: 50.00	1.00	Corrections to original description (no format change)
22187-22190	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)
22191-22194	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)
22195-22198	Longest Allowable Lag	CHAR* 8	HRS	“XXXXX.XX” (space padded) Range: 100.00 to 1000.00 Default:	1.00	Correction to original description (no format change)

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
				168.00		
22199-22202	Bias Applied Flag	CHAR* 8	N/A	“XXXXXXX X” (space padded) Range: T or F Default: F	N/A	
BEGINNING OF THE SUPPLEMENTAL SUB-LAYER OF DSP ALPHANUMERIC LAYER						
22203-22206	Supplemental data header	CHAR* 8	N/A	“SUPL(15)”	N/A	Correction to original description (no format change)
22207-22210	Average Scan Date	CHAR* 8	Julian Dalys	0-99999	1	
22211-22214	Average Scan Time	CHAR* 8	Sec	0-86399	1	
22215-22218	Flag Zero Hybrid	CHAR* 8	N/A	0 or 1	1	
22219-22222	Rain Detection Flag	CHAR* 8	N/A	0 or 1	1	
22223-22226	Reset STP Flag	CHAR* 8	N/A	0 or 1	1	
22227-22230	Precip. Begin Flag	CHAR* 8	N/A	0 or 1	1	
22231-22234	Last Date Rain	CHAR* 8	Julian Days	0-99999	1	
22235-22238	Last Time Rain	CHAR* 8	Sec	0-86399	1	
22239-22242	Rejected Blockage Counter	CHAR* 8	N/A	0-82800	1	
22243-22246	Rejected AP/Clutter Counter	CHAR* 8	N/A	0-82800	1	
22247-22250	Total Bins Smooth	CHAR* 8	N/A	0	N/A	Not implemented
22251-22254	Percentage Filled Hybrid Scan	CHAR* 8	N/A	0.00 to 100.00	0.01	
22255-22258	Highest Elevation Angle	CHAR* 8	N/A	0.50 to 19.50	0.01	
22259-22262	Rain Summation Area	CHAR* 8	N/A	0.0-166190.3	0.1	CCR #NA04-27811 Corrections to

HALF-WORD	FIELDNAME	TYPE	UNITS	VALUE	PRECISION/ACCURACY	NOTES
						original description (no format change)
22263-22266	Volume Spot Blank	CHAR* 8	N/A	0 to 1	1	
BEGINNING OF THE BIAS TABLE SUB-LAYER OF DSP ALPHANUMERIC LAYER						
22267-22270	Bias Table data header	CHAR* 8	N/A	“BIAS(11)”	N/A	Correction to original description (no format change)
22271-22274	Time Last Update of Local Bias Value	CHAR* 8	Sec	0-86399	1	
22275-22278	Date Last Update of Local Bias Value	CHAR* 8	Julian Days	0-99999	1	
22279-22282	Time of Last Update of Local Bias Table	CHAR* 8	Sec	0-86399	1	
22283-22286	Date of Last Update of Local Bias Table	CHAR* 8	Julian Days	0-99999	1	
22287-22290	Observation Time of Latest Bias Table	CHAR* 8	Sec	0-86399	1	
22291-22294	Observation Date of Latest Bias Table	CHAR* 8	Julian Days	0-99999	1	
22295-22298	Generation Time of Latest Bias Table	CHAR* 8	Sec	0-86399	1	
22299-22302	Generation Date of Latest Bias Table	CHAR* 8	Julian Days	0-99999	1	
22303-22306	Mean-Field Bias Estimate	CHAR* 8	N/A	.01-100.	.01	
22307-22310	Effective G-R Pair	CHAR* 8	N/A	0.00-999.99	.01	
22311-22314	Memory Span	CHAR* 8	N/A	0.001-10.**7	.001	

[GRAPHIC ALPHANUMERIC BLOCK IS NOT USED BY DSP]

[TABULAR ALPHANUMERIC BLOCK IS NOT USED BY DSP]

The following is an example of the alphanumeric layer (layer 2) of the DSP product, as rendered by CODE cvt.

CVT using variable CV_ORPG_BUILD to set ORPG Build to 6

*** ORPG DATABASE PRODUCT LOAD UTILITY ***

-> Number of Products Available=5417

-> Message ID=5398

-> Product Info: LBuffer# 138 MSGLEN 044724 VOLNUM 158 ELEV 07

-> Set Processing ONLY for Layer Number 2

packet code 1 found

Packet 1: Write Text (No Value) Summary Information

Length of Data Block (in bytes) = 548

I Starting Point: 0

J Starting Point: 0

Message to follow:

PSM (6)	12335	48300	12335	48300	1	LADAP(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
SUPL(15)	12335	48448	0	1	0	0	12335	48448	0
12576	0	99.86	9.90	14772.4		0BIAS(11)	58368	10461	0
0	72000	11695	75453	11695	1.2550	13.49	168.		

program complete