

National Climatic Data Center

DATA DOCUMENTATION

FOR

DSI-6500

NEXRAD LEVEL II

April 11, 2005

National Climatic Data Center
151 Patton Ave.
Asheville, NC 28801-5001 USA

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Table of Contents

Topic	Page Number
1. Abstract.....	3
2. Element Names and Definitions:	6
3. Start Date.....	13
4. Stop Date.....	13
5. Coverage.....	13
6. How to order data.....	13
7. Archiving Data Center.	14
8. Technical Contact.....	14
9. Known Uncorrected Problems.....	14
10. Quality Statement.....	14
11. Essential Companion Data Sets.....	14
12. References.....	14

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1. **Abstract:** Weather Surveillance Radar - 1988 Doppler (WSR-88D), or NEXt Generation RADar (NEXRAD), Level II data are the base digital data produced at each National Weather Service (NWS) radar site. The Level II base data are generated by the signal processor (mean radial velocity, reflectivity, and spectrum width) at the full spatial and temporal resolution of the radar. Level II base data also contains status messages, performance/maintenance data, volume scan strategy, clutter filter bypass map, and wideband communication console messages. These are the same data transmitted over high-speed, wideband communications to the WSR-88D Radar Product Generator (RPG) for processing by the meteorological analysis algorithms.

Level II base data is used to ensure proper calibration of the radars, by researchers to investigate events in more detail than would be possible by using the Level III products (NCDC DSI-7000), to test revised algorithms that may later be applied to operational use, and for training purposes.

Level II base data was recorded on 8mm tapes beginning in the early 1990's and was originally archived on 8mm tapes. Currently Level II base data are distributed in near real-time from NWS Regional servers. All Level II base data has been archived in compressed tape archive format (tar) on the NCDC Hierarchical Data Storage System (HDSS). Each tar file contains 8 hours of Level II base data for one NWS radar site. The Level II base data archive is made available via the World Wide Web on the NCDC Home Page.

<http://hurricane.ncdc.noaa.gov/pls/plhas/has.dsselect>

This documentation applies to all individual datasets for Doppler RADAR data nation wide.

The Weather Surveillance Radar - 1988 Doppler (WSR-88D) data sets are:

KABR	ABERDEEN SD	RKSG	CAMP HUMPHREYS KOREA
KENX	ALBANY NY	KCLX	CHARLESTON SC
KABX	ALBUQUERQUE NM	KRLX	CHARLESTON WV
KAMA	AMARILLO TX	KCYS	CHEYENNE WY
PAHG	ANCHORAGE AK	KLOT	CHICAGO IL
KFFC	ATLANTA GA	KILN	CINCINNATI OH
KEWX	AUSTIN TX	KCLE	CLEVELAND OH
KBBX	BEALE AFB CA	KCAE	COLUMBIA SC
PABC	BETHEL AK	KGWX	COLUMBUS AFB MS
KBLX	BILLINGS MT	KAMX	MIAMI FL (WAS CORAL GABLES)
KBGM	BINGHAMTON NY	KCRP	CORPUS CHRISTI TX
KBMX	BIRMINGHAM AL	KFTG	DENVER CO
KBIS	BISMARCK ND	KDMX	DES MOINES IA
KCBX	BOISE ID	KDTX	DETROIT MI
KBOX	BOSTON MA	KDDC	DODGE CITY KS
KBRO	BROWNSVILLE TX	KDOX	DOVER AFB DE
KBUF	BUFFALO NY	KMXX	MAXWELL AFB AL
KCXX	BURLINGTON/COLCHESTER VT	KDLH	DULUTH MN
KFDX	CANNON AFB NM	KDYX	DYESS AFB TX
KICK	CEDAR CITY UT	KEVX	EGLIN AFB FL
KCBW	HOULTON ME	KMVX	GRAND FORKS ND
KILX	LINCOLN IL	KEPZ	EL PASO TX
KCCX	STATE COLLEGE PA	KLRX	ELKO NV
KGRK	FORT HOOD TX	KBHX	EUREKA CA

KEYX	EDWARDS AFB CA	KMHX	MOREHEAD CITY NC
PAPD	FAIRBANKS AK	KOHX	NASHVILLE TN
KFSX	FLAGSTAFF AZ	KLIX	NEW ORLEANS LA
KFDR	ALTUS AFB OK	KOKX	NEW YORK CITY NY
KHPX	FT CAMPBELL KY	PAEC	NOME AK
KEOX	FT RUCKER AL	KAKQ	NORFOLK VA
KPOE	FT POLK LA	KAPX	GAYLORD MI
KFWS	DALLAS/FT WORTH TX	KLNX	NORTH PLATTE NE
GGT	GEORGETOWN BAHAMAS	KTLX	OKLAHOMA CITY OK
KGGW	GLASGOW MT	KOAX	OMAHA NE
KGLD	GOODLAND KS	KPAH	PADUCAH KY
KGJX	GRAND JUNCTION CO	KPDT	PENDLETON OR
GDT	GRAND TURK BAHAMAS	KDIX	PHILADELPHIA PA
KGRR	GRAND RAPIDS MI	KIWA	PHOENIX AZ
KTFX	GREAT FALLS MT	KPBZ	PITTSBURGH PA
KGRB	GREEN BAY WI	KSFX	POCATELLO ID
KGSP	GREER SC	KGYX	PORTLAND ME
KRMX	GRIFFISS AFB NY	KRTX	PORTLAND OR
PGUA	ANDERSEN AFB GUAM	KPUX	PUEBLO CO
KHGX	HOUSTON/GALVESTON TX	KDVN	DAVENPORT IA
KHDX	HOLLOMAN AFB NM	KRAX	RALEIGH NC
KUEX	HASTINGS NE	KUDX	RAPID CITY SD
KIND	INDIANAPOLIS IN	KRGX	RENO NV
KJAN	JACKSON MS	KRIW	RIVERTON WY
KJKL	JACKSON KY	KFCX	ROANOKE VA
KJAX	JACKSONVILLE FL	KJGX	ROBINS AFB GA
PAEI	SITKA AK	KDAX	SACRAMENTO CA
PDON	KAMUELA HI	KMTX	SALT LAKE CITY UT
KEAX	KANSAS CITY MO	KSJT	SAN ANGELO TX
KBYX	KEY WEST FL	KNKX	SAN DIEGO CA
PAKC	KING SALMON AK	KMUX	SAN FRANCISCO CA
KMRX	KNOXVILLE-TRI CITIES TN	TCBR	SAN JUAN PR
KARX	LA CROSSE WI	KHNX	SAN JOAQUIN VALLEY CA
LPLA	LAJES AFB AZORES	KATX	SEATTLE WA
KLCH	LAKE CHARLES LA	KFSD	SIOUX FALLS SD
KESX	LAS VEGAS NV	KOTX	SPOKANE WA
KDFX	LAUGHLIN AFB TX	KSGF	SPRINGFIELD MO
KLZK	LITTLE ROCK AR	KSHV	SHREVEPORT LA
KVTX	LOS ANGELES CA	PDHB	SOUTH SHORE HI
KLVX	LOUISVILLE KY	PHKI	SOUTH KAUAI HI
KLBB	LUBBOCK TX	KLSX	ST LOUIS MO
KMQT	MARQUETTE MI	KLWX	STERLING VA/ BALTIMORE/WASHINGTON DC
KMAX	MEDFORD OR	KTLH	TALLAHASSEE FL
KMLB	MELBOURNE FL	KTBW	TAMPA FL
KNQA	MEMPHIS TN	KTWX	TOPEKA KS
PAIH	MIDDLETON AK	KINX	TULSA OK
KMAF	MIDLAND TX	KEMX	TUCSON AZ
KMKX	MILWAUKEE WI	KVNX	VANCE AFB OK
KMPX	MINNEAPOLIS MN	KVBX	VANDENBURG AFB CA
KMBX	MINOT AFB ND	KICT	WICHITA KS
KMSX	MISSOULA MT	KLTX	WILMINGTON NC
KMOB	MOBILE AL	KYUX	YUMA AZ
PTEJ	MOLOKAI HI		

2. Element Names and Definitions:

FORMAT:

HEADER FILE: The first file on tape contains only one 31616 byte record. This record is called the header record.

HEADER RECORD: This 31616 byte "physical record" is divided into 494 "logical records" of 64 bytes each. The convention here is to begin with position 1 as the first byte.

<u>POSITIONS</u>	<u>FORMAT</u>	<u>DESCRIPTION</u>
1 - 8	C*8	Always ARCHIVE2
9 - 12	C*4	4-letter site ID. e.g. KLMB
13 - 18	C*6	NCDC tape number. e.g. N00001
19		Blank
20 - 28	C*9	Date tape written. dd- <u>MMM</u> -yy e.g. 19-FEB-93
29		Blank
30 - 37	C*8	Time tape written. hh:mm:ss. e.g. 10:22:59
38		Blank
39 - 43	C*5	Data Center writing tape: RDASC or NCDC (Left justified, blank filled)
44 - 48	C*5	WBAN Number of this NEXRAD site. (This is a unique 5-digit number assigned at NCDC. Numbers are contained in the NCDC NEXRAD Station History file. The file also contains the four letter site ID, Latitude, Longitude, Elevation, and common location name.)
49 - 50	C*5	Tape output mode. Current values are 8200, 8500, 8500C
54 - 58	C*5	A volume number to be used for copies and extractions of data from tapes. The form would be VOL01,VOL02,VOL03...VOLnn.
59 - 64		Blank (Available for future use.)
65 - 31616		May be used for internal controls or other information at each archive center. Information of value to users will be documented at the time of tape shipment.

During the process of copying archive tapes, positions 1-18 and 44-48 would be duplicated. New values would be written in positions 19-43 and 49-58.

DATA FILES:

A data file contains a title, a complete radar volume scan (360 degree

revolutions at each specified elevation cut) of base data, digital radar data message, and any control/response messages from the RDA to the RPG. A new data file is created upon completion of a volume scan. The title is the first record located on each data file and contains a file name, creation date, and creation time.

Following the title record through the remainder of the data file, variable length records containing base data intermixed with control/response messages are recorded. Messages and base data are distinguishable by a message header coded for either digital radar base data or one of the thirteen types of messages. The message header uses a format common to both data or messages and is included in each 2432 byte packet. Depending on the predefined volume scan strategy (selected elevations, sweep rate, pulse rate etc.) used during the collection period, each data file could contain either five, six, or ten minutes of base data. Control/response messages are used during actual operations and are of limited use for post analyses.

DATA TYPES SUPPORTED WITHIN DATA FILES:

A Concurrent minicomputer serves as the host computer for generation of all Archive Level II data. Depending on the computer used for reading the tapes, the data types may be different from that used in the Concurrent system. The Concurrent computer byte (8 bits) structure places bit 0 as the left most bit and designates bit 0 as the Most Significant Bit (MSB). Bit 7 for a byte, bit 15 for a halfword (2 bytes), bit 31 for a fullword (4 bytes) and bit 63 for a double word (8 bytes) are all the Least Significant Bit (LSB) for their respective data formats.

Level II is recorded using the following data types:

Unsigned byte (byte) - number ranging from 0-255

Character (C) - Standard ASCII characters

Signed Short Integer (I*2) - Most Significant Bit (MSB) is the sign bit (bit 0). (1-Negative, 0-Positive).

Signed Long Integer (I*4) - MSB (bit 0) is the sign bit.

Single Precision Real (R*4) - MSB (bit 0) is the sign bit (positive), bit 1-7 is the exponent in excess-64 notation format, and bit 8-31 is the fraction field. An example may be helpful:

Starting with 4180 69E8 (hex), the sign bit = 0 (positive), the exponent = +1 [e.g. 41 (hex) converted to 65 (dec) - 64 (excess 64 notation) = +1], and the fraction 8069E8 (hex) shifted by exponent of +1 gives 8.069E8 (hex). To convert 8.069E8 (hex) to decimal, start with the whole number 8 (hex) which in this case equals 8 (dec). Next, the precision of the fraction .069E8 must be noted. This fraction has 5 digits of precision. Next, the fraction portion in hex (069E8) is converted to decimal (27112) and divided by 16 raised to the power of the precision of the fraction (5). In other words $27112/(16^{*}5) = .02585$ plus the whole number 8, gives 8.02585 in decimal.

DATA RECORDS:

Within the data file, base data and control/response messages contained within the data file are stored using a variable record length structure. The convention here is to begin with byte 0 as the first byte. Included as the first record of each data file is a volume scan title containing the following

information:

<u>Bytes</u>	<u>Format</u>	<u>Description</u>
0-8	C*9	Filename (root) - "ARCHIVE2."
9-11	C*3	Filename (extension) - "1", "2", etc.
12-15	I*4	Modified Julian Date referenced from 1/1/70
16-19	I*4	Time - Milliseconds of day from midnight (GMT) when file was created.
20-23		Unused

All remaining records in the data file are composed of data and command/response messages which are initially stored in separate 2432 byte packets within an RDA memory buffer. During the archive process the packets are copied from memory and grouped together to form a record. Record lengths are variable and are always sized in multiples of the 2432 byte packets. During the reblocking process, physical records are set to 31616 bytes (2432 x 13).

The following example shows a portion of one packet which includes Concurrent computer Channel Terminal Manager (CTM) information, a message header, and a digital radar data message containing reflectivity only.

```
0000 0000 0980 0000 0002 0000 04B8 0001
0060 1E9E 04B0 1841 0001 0001 0480 14A2
1E9E 1234 6530 0059 0001 0058 0001 0000
FE89 03E8 00FA 01CC 0000 0001 4180 69E8
0064 0000 0000 0000 0015 0000 0000 0000
0000 0064 0000 0000 0000 0000 FFF4 0064 0000
0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000
005A 5A00 0070 6D51 6455 6060 4F54 0040
5C3F 4049 4900 4D42 4349 434E 4B3D 4430
4340 3F3D 4644 4443 3A3D 473F 3A3A 3D3D
3C45 3A43 433C 3E43 413C 393F 3F40 4038
(etc.)
```

Using the above example, each portion of the packet is described in detail. Remember, this packet may be one of several contained in one record within the data file.

Bytes 0-11 (halfwords 1-6)

```
0000 0000 0980 0000 0002 0000 04B8 0001
0060 1E9E 04B0 1841 0001 0001 0480 14A2
1E9E 1234 6530 0059 0001 0058 0001 0000
FE89 03E8 00FA 01CC 0000 0001 4180 69E8
0064 0000 0000 0000 0015 0000 0000 0000
0000 0064 0000 0000 0000 0000 FFF4 0064 0000
0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000
005A 5A00 0070 6D51 6455 6060 4F54 0040
5C3F 4049 4900 4D42 4349 434E 4B3D 4430
4340 3F3D 4644 4443 3A3D 473F 3A3A 3D3D
3C45 3A43 433C 3E43 413C 393F 3F40 4038
(etc.)
```

Channel Terminal Manager (CTM) information. Archive II is a copy of messages or data packets prepared for transmission from the RDA to the RPG. CTM information is attached to a message or data packet for checking data integrity during the transmission process and is of no

importance to the base data (omit or read past these bytes).

Bytes 12-27 (halfwords 7-14)

```

0000 0000 0980 0000 0002 0000 04B8 0001
0060 1E9E 04B0 1841 0001 0001 0480 14A2
1E9E 1234 6530 0059 0001 0058 0001 0000
FE89 03E8 00FA 01CC 0000 0001 4180 69E8
0064 0000 0000 0000 0015 0000 0000 0000
0000 0064 0000 0000 0000 FFF4 0064 0000
0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000
005A 5A00 0070 6D51 6455 6060 4F54 0040
5C3F 4049 4900 4D42 4349 434E 4B3D 4430
4340 3F3D 4644 4443 3A3D 473F 3A3A 3D3D
3C45 3A43 433C 3E43 413C 393F 3F40 4038
(etc.)

```

Message Header. This information is used to identify either base data or one of thirteen types of messages that may follow in bytes 28-2431. This header includes the following information:

<u>Halfword</u>	<u>Format</u>	<u>Description</u>
7	I*2	Message size in halfwords measured from this halfword to end of record.
8	I*1	(Left Byte) Channel ID: 0 = Non-Redundant Site 1 = Redundant Site Channel 1 2 = Redundant Site Channel 2
8	I*1	(Right Byte) Message type, where: 1 = DIGITAL RADAR DATA (This message may contain a combination of either reflectivity, aliased velocity, or spectrum width) 2 = RDA STATUS DATA. 3 = PERFORMANCE/MAINTENANCE DATA. 4 = CONSOLE MESSAGE - RDA TO RPG. 5 = MAINTENANCE LOG DATA. 6 = RDA CONTROL COMMANDS. 7 = VOLUME COVERAGE PATTERN. 8 = CLUTTER CENSOR ZONES. 9 = REQUEST FOR DATA. 10 = CONSOLE MESSAGE - RPG TO RDA. 11 = LOOP BACK TEST - RDA TO RPG. 12 = LOOP BACK TEST - RPG TO RDA. 13 = CLUTTER FILTER BYPASS MAP - RDA to RPG. 14 = EDITED CLUTTER FILTER BYPASS MAP - RPG to RDA.
9	I*2	I.D. Sequence = 0 to 7FFF, then roll over back to 0.

10	I*2	Modified Julian date starting from 1/1/70.
11-12	I*4	Generation time of messages in milliseconds of day past midnight (GMT). This time may be different than time listed in halfwords 15-16 defined below.
13	I*2	Number of message segments. Messages larger than message size (halfword 7 defined above) are segmented and recorded in separate data packets.
14	I*2	Message segment number.

Bytes 28-127 (halfwords 15-64)

```

0000 0000 0980 0000 0002 0000 04B8 0001
0060 1E9E 04B0 1841 0001 0001 0480 14A2
1E9E 1234 6530 0059 0001 0058 0001 0000
FE89 03E8 00FA 01CC 0000 0001 4180 69E8
0064 0000 0000 0000 0015 0000 0000 0000
0000 0064 0000 0000 0000 FFF4 0064 0000
0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000
005A 5A00 0070 6D51 6455 6060 4F54 0040
5C3F 4049 4900 4D42 4349 434E 4B3D 4430
4340 3F3D 4644 4443 3A3D 473F 3A3A 3D3D
3C45 3A43 433C 3E43 413C 393F 3F40 4038
(etc.)

```

Digital Radar Data Header. This information describes the date, time, azimuth, elevation, and type of base data included in the radial. This header includes the following information:

<u>Halfword</u>	<u>Format</u>	<u>Description</u>
15-16	I*4	Collection time for this radial in milliseconds of day past midnight (GMT).
17	I*2	Modified Julian date referenced from 1/1/70.
18	I*2	Unambiguous range (scaled: Value/10. = KM).
19	I*2	Azimuth angle (coded: [Value/8.]*[180./4096.] = DEG). An azimuth of "0 degrees" points to true north while "90 degrees" points east. Rotation is always clockwise as viewed from above the radar.
20	I*2	Radial number within the elevation scan.
21	I*2	Radial status where: 0 = START OF NEW ELEVATION. 1 = INTERMEDIATE RADIAL. 2 = END OF ELEVATION. 3 = BEGINNING OF VOLUME SCAN. 4 = END OF VOLUME SCAN.
22	I*2	Elevation angle (coded: [Value/8.]*[180./4096.] = DEG). An elevation of "0 degree" is parallel to the pedestal base while "90 degrees" is perpendicular to the pedestal base.

23	I*2	RDA elevation number within the volume scan.
24	I*2	Range to first gate of reflectivity data (METERS). Range may be negative to account for system delays in transmitter and/or receiver components.
25	I*2	Range to first gate of Doppler data. Doppler data - velocity and spectrum width (METERS). Range may be negative to account for system delays in transmitter and/or receiver components.
26	I*2	Reflectivity data gate size (METERS).
27	I*2	Doppler data gate size (METERS).
28	I*2	Number of reflectivity gates.
29	I*2	Number of velocity and/or spectrum width data gates.
30	I*2	Sector number within cut.
31-32	R*4	System gain calibration constant (dB biased).
33	I*2	Reflectivity data pointer (byte # from start of digital radar data message header). This pointer locates beginning of reflectivity data.
34	I*2	Velocity data pointer (byte # from start of digital radar data message header). This pointer locates beginning of velocity data.
35	I*2	Spectrum width pointer (byte # from start of digital radar data message header). This pointer locates beginning of spectrum width data.
36	I*2	Doppler velocity resolution. Value of: 2 = 0.5 m/s 4 = 1.0 m/s
37	I*2	Volume coverage pattern. Value of: 11 = 16 elev. scans/ 5 mins. 21 = 11 elev. scans/ 6 mins. 31 = 8 elev. scans/ 10 mins. 32 = 7 elev. scans/ 10 mins.
38-41		Unused. Reserved for V&V Simulator.
42	I*2	Reflectivity data pointer for Archive II playback. Archive II playback pointer used exclusively by RDA.
43	I*2	Velocity data pointer for Archive II playback. Archive II playback pointer used exclusively by RDA.
44	I*2	Spectrum width data pointer for Archive II playback. Archive II playback pointer used

exclusively by RDA.

- 45 I*2 Nyquist velocity (scaled: Value/100. = M/S).
- 46 I*2 Atmospheric attenuation factor (scaled:
[Value/1000. = dB/KM]).
- 47 I*2 Threshold parameter for minimum difference in
echo power between two resolution volumes for
them not to be labeled range ambiguous (i.e.,
overlaid) [Value/10. = Watts].
- 48-64 Unused.

Bytes 128-2431 (halfwords 65-1216)

0000	0000	0980	0000	0002	0000	04B8	0001
0060	1E9E	04B0	1841	0001	0001	0480	14A2
1E9E	1234	6530	0059	0001	0058	0001	0000
FE89	03E8	00FA	01CC	0000	0001	4180	69E8
0064	0000	0000	0000	0015	0000	0000	0000
0000	0064	0000	0000	0000	FFF4	0064	0000
0000	0000	0000	0000	0000	0000	0000	0000
0000	0000	0000	0000	0000	0000	0000	0000
005A	5A00	0070	6D51	6455	6060	4F54	0040
5C3F	4049	4900	4D42	4349	434E	4B3D	4430
4340	3F3D	4644	4443	3A3D	473F	3A3A	3D3D
3C45	3A43	433C	3E43	413C	393F	3F40	4038

(etc.)

Base data. This information includes the three base data moments of reflectivity, aliased velocity, and spectrum width. Depending on the collection method, up to three base data moments may exist in this section of the packet (for this example, only reflectivity is present). Base data is coded and placed in a single byte and is archived in the following format:

- 65-294 BYTE Reflectivity data (Ø - 46Ø gates) (coded: $[(\text{Value}-2)/2.]-32. = \text{dBZ}]$, for Value of Ø or 1 see note below).

- 65-754 BYTE Doppler velocity data (coded: for doppler velocity resolution of 0.5 M/S, $[(\text{Value}-2)/2.]-63.5 = \text{M/S}]$; for doppler resolution of 1.Ø M/S, $[(\text{Value}-2)-127.] = \text{M/S}]$, for Value of Ø or 1 see note below), (Ø - 92Ø gates). Starting data location depends on length of the reflectivity field, stop location depends on length of the velocity field. Velocity data is range unambiguous out to 23Ø KM.

- 65-1214 BYTE Doppler spectrum width (coded: $[(\text{Value}-2)/2.]-63.5 = \text{M/S}]$, for Value of Ø or 1 see note below), (Ø - 92Ø gates). Starting data location depends on length of the reflectivity and velocity fields, stop location depends on length of the spectrum width field. Spectrum width is range unambiguous out to 23Ø KM.

Four bytes of trailer characters referred to the Frame Check Sequence (FCS) follow the data. In cases where the three moments are not all present or the number of gates for each moment have been reduced, the record is padded out to a constant size of 1216 halfwords (2432 bytes) following the trailer characters.

Note: Any base data value of Ø is data below Signal to Noise Ratio (SNR) thresholds set for that specific base data. Any base data value of 1 is data considered range ambiguous (i.e., overlaid).

- 3. Start Date: 19910605 1621Z

- 4. Stop Date: Ongoing.

- 5. Coverage: North America
 - a. Southernmost Latitude: 18 N
 - b. Northernmost Latitude: 67 N
 - c. Westernmost Longitude: 126 W
 - d. Easternmost Longitude: -65 E

6. How to Order Data:

Ask NCDC's Climate Services about the cost of obtaining this data set.
Phone: 828-271-4800
FAX: 828-271-4876
E-mail: NCDC.Orders@noaa.gov

:
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7. **Archiving Data Center:**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

8. **Technical Contact:**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

NWS/Operational Support Facility
Applications/Operations Branch
1200 Westheimer Dr.
Norman, OK 73069
Phone: (405) 366-6530
FAX: (405) 366-6550

9. **Known Uncorrected Problems:** None.

10. **Quality Statement:** The WSR-88D is a very complex system. Program modifications and engineering changes are rather constant features during the phase-in process. Some early pre-production models experienced considerable difficulties in the recording of Level II data. Even today, tapes are received that contain spurious, erroneous, or illegal configurations. We have attempted to recover as much data as possible from these problem tapes. The user is cautioned that these anomalies may be encountered while reading the archive tapes. Special care must be taken to ensure that illegal configurations do not contaminate any summaries or statistical studies.

NCDC will be glad to assist in solving problems encountered in reading the tapes, but technical questions about the data themselves must be addressed to the:

NWS/Operational Support Facility
Applications/Operations Branch
1200 Westheimer Dr.
Norman, OK 73069

Telephone: (405) 366-6530
FAX: (405) 366-6550

11. **Essential Companion Datasets:** None.

12. **References:** No information provided with original documentation. Definitive information about all aspects of the Doppler radar is contained in Federal Meteorological Handbook -11 (FMH-11), Volumes A through D. These may be ordered from the National Climatic Data Center.

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