

High Density Observations (HDOB) Bulletins

The HDOB message is used to transmit High-Density/High Accuracy (HD/HA) meteorological data from hurricane reconnaissance aircraft. These are created automatically by the system software. Each message consists of a communications header line (Table G-3), a mission/ob identifier line (Table G-4), and 20 lines of HD/HA data (Table G-5).

Within an HDOB message, the time interval (resolution) between individual HD/HA observations can be set by the operator to be 30, 60, or 120 seconds. However, regardless of the time resolution of the HD/HA data, *the meteorological parameters in the HDOB message always represent 30-s averages along the flight track* (except for certain peak values as noted in Table G-5).

The nominal time of each HD/HA record is the midpoint of the 30-s averaging interval. This means that an HD/HA record at time t will include data measured at time t+15 s. For purposes of determining peak flight-level and SFMR winds, the encoding interval begins 15 s after the nominal time of the last HD/HA record and ends 15 s after the nominal time of the record being encoded.

A sample HDOB message is given below (message begins with UR..15...):

```
0           1           2           3           4           5           6           7
01234567890123456789012345678901234567890123456789012345678901234567890
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URNT15 KNHC 281426
AF302 1712A KATRINA           HDOB 41 20050928
142030 2608N 08756W 7093 03047 9333 +192 +134 133083 089 080 999 00
142100 2609N 08755W 7091 03054 9330 +166 +146 133106 115 103 999 00
142130 2610N 08754W 7058 03040 9295 +134 +134 135121 124 111 999 00
142200 2611N 08753W 7037 03060 9291 +124 +124 138129 136 122 999 00
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142230 2612N 08752W 7010 03057 9282 +102 +102 141153 166 148 999 00
142300 2612N 08751W 7042 03010 9293 +088 +083 133159 164 147 999 00
142330 2613N 08750W 6999 03064 9279 +088 +088 138158 161 144 999 00
142400 2614N 08749W 7005 03046 9281 +080 +080 138155 158 142 999 00
142430 2614N 08748W 6998 03048 9278 +078 +078 138151 153 137 999 00
142500 2615N 08747W 7002 03048 9279 +084 +084 140146 148 133 999 00
$$
```

Figure G-2. HDOB description and Sample Message

Table G-5. HD/HA Data Line Format for HDOB messages

0	1	2	3	4	5	6	7
01234567890123456789012345678901234567890123456789012345678901234567890							

hhmmss LLLLH NNNNNW PPPP GGGGG XXXX sTTT sddd wwwSSS MMM KKK ppp FF
 142230 2612N 08752W 7010 03057 9282 +102 +102 141153 166 148 999 00

hhmmss: Observation time, in hours, minutes and seconds (UTC). The observation time is the midpoint of the 30-s averaging interval used for the record's meteorological data.

LLLLH: The latitude of the aircraft at the observation time in degrees (LL) and minutes (LL). The hemisphere (H) is given as either N or S.

NNNNH: The longitude of the aircraft at the observation time, in degrees (NNN) and minutes (NN). The hemisphere (H) is given as either E or W.

PPPP: Aircraft static air pressure, in tenths of mb with decimal omitted, at the observation time. If pressure is equal to or greater than 1000 mb the leading 1 is dropped.

GGGGG: Aircraft geopotential height, in meters, at the observation time.

XXXX: Extrapolated surface pressure or D-value (30-s average). Encoded as extrapolated surface pressure if aircraft static pressure is 550.0 mb or greater (i.e., flight altitudes at or below 550 mb). Format for extrapolated surface pressure is the same as for static pressure. For flight altitudes higher than 550 mb, **XXXX** is encoded as the D-value, in meters. Negative D-values are encoded by adding 5000 to the D-value.

s: Sign of the temperature or dew point (+ or -).

sTTT: The air temperature in degrees and tenths Celsius, decimal omitted (30-s average).

- sddd:** The dew point temperature, in degrees and tenths Celsius, decimal omitted (30-s average).
- www:** Wind direction in degrees (30-s average). North winds are coded as 000. 999 indicates missing value.
- SSS:** Wind speed, in kt (30-s average). 999 indicates missing value.
- MMM:** Maximum 10-second average wind speed occurring within the encoding interval, in kt. 999 indicates missing value.
- KKK:** Maximum 10-second average surface wind speed occurring within the encoding interval from the Stepped Frequency Microwave Radiometer (SFMR), in kt. 999 indicates missing value.
- ppp:** SFMR-derived rain rate, in mm hr^{-1} , evaluated over the 10-s interval chosen for KKK. 999 indicates missing value.
- FF:** Quality control flags.

First column indicates status of positional variables as follows:

- 0 All parameters of nominal accuracy
- 1 Lat/lon questionable
- 2 Geopotential altitude or static pressure questionable
- 3 Both lat/lon and GA/PS questionable

Second column indicates status of meteorological variables as follows:

- 0 All parameters of nominal accuracy
- 1 T or TD questionable
- 2 Flight-level winds questionable
- 3 SFMR parameter(s) questionable
- 4 T/TD and FL winds questionable
- 5 T/TD and SFMR questionable
- 6 FL winds and SFMR questionable
- 9 T/TD, FL winds, and SFMR questionable

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