

# 19890915H1 - FDIR

HUGO Energenics

FLIGHT #1 890915H N42RF

TYPE OF DATA

SENSOR OR OPTION

|  |                                |
|--|--------------------------------|
| INE  | 2                              |
| Accelerometer                                  | 2                              |
| Temperature probe                              | 1                              |
| Altitude change option<br>(for vertical winds) | RA                             |
| Static pressure                                | Rosemount fuselage             |
| Dynamic pressure                               | Rosemount fuselage (wingtip on |
| Time source                                    | Micro 29 BIPAC tape)           |
| Constants file                                 | CO2894.CON                     |

## Selection of pressures

On the BIPAC tape only, static pressure was taken from the fuselage, and dynamic pressure was taken from the wingtip and corrected using the following formula:

$$PQw(\text{corrected}) = PQw(\text{raw}) + (PSw - PSf)$$

In other words, we are assuming that the total pressure ( $PSw + PSf$ ) on the wingtip is good, and the static pressure ( $PSf$ ) on the fuselage is good. This compromise appears to give the best pressures in areas of heavy turbulence. The tape done using the standard software was run using fuselage sensors only; the software was not configured to allow the mixing of fuselage and wingtip sensors.

## Time gaps

There was one time gap: 18:49:21 - 18:49:40

## Dewpoint

A severe oscillation occurred in the dewpoint data. This oscillation had an amplitude of +/- one degree C and a variable frequency. At times the frequency was about .06 Hz (see enclosed plots), but at other times the oscillation changed its frequency to about .12 Hz. The frequency of oscillation may depend upon the altitude or ambient temperature. None of the oscillation frequencies observed on this flight have been seen in previous seasons--the old familiar dewpoint oscillation of past years occurred at .17 Hz. In my opinion, NO DEWPOINT INFORMATION EXISTS ON TIME SCALES LESS THAN 20 SECONDS (.05 Hz) on this flight. In other words, you cannot resolve humidity fluctuations on spatial scales less than 2 km. This instrument is in a state of steady deterioration; don't be surprised if you have no usable dewpoint information at all. Unfortunately, there are no plans to replace this instrument--you'll have to live with it next season, too.

Five spikes were removed from the dewpoint data during the heaviest pounding: 17:27:30 - 17:28:20.

Pressures  
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On the BIPAC tape only, dynamic attack and slip pressures were recomputed during the initial eyewall penetration, 17:27:01 - 17:28:20. The corrected calibrated wingtip dynamic pressure, offset by the appropriate constant, was substituted into the dynamic attack and slip pressures. This changed the attack and slip angles by 0 - .3 degrees. The attack was more affected than the slip, in general.

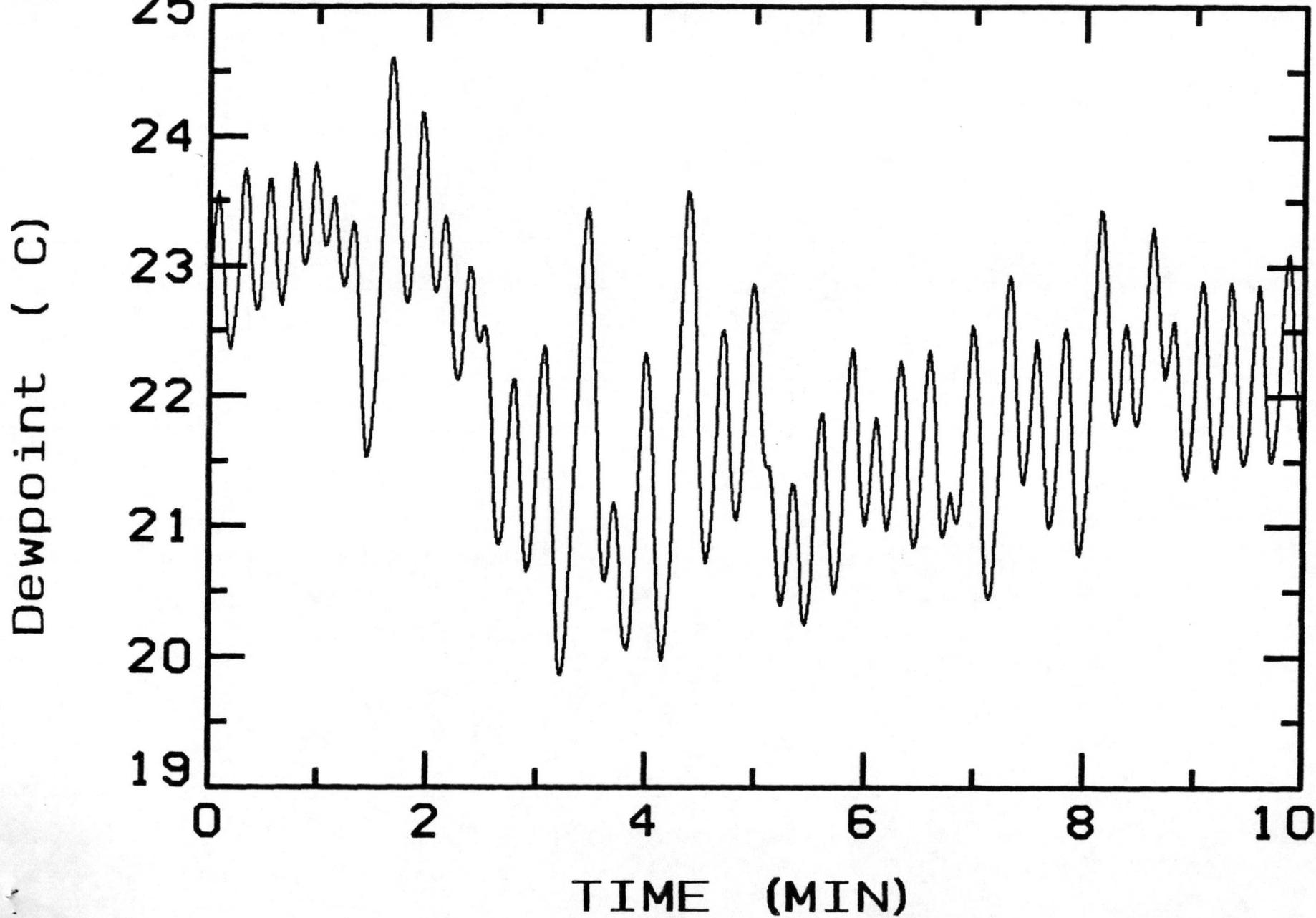
Liquid water  
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J&W liquid water failed from the beginning of the flight until 17:06.

|                          | Take off<br>----- | Landing<br>----- |
|--------------------------|-------------------|------------------|
| Aircraft static pressure | 1005.3mb          | NOBS             |
| Corrected tower pressure | 1006.3mb          | NOBS             |

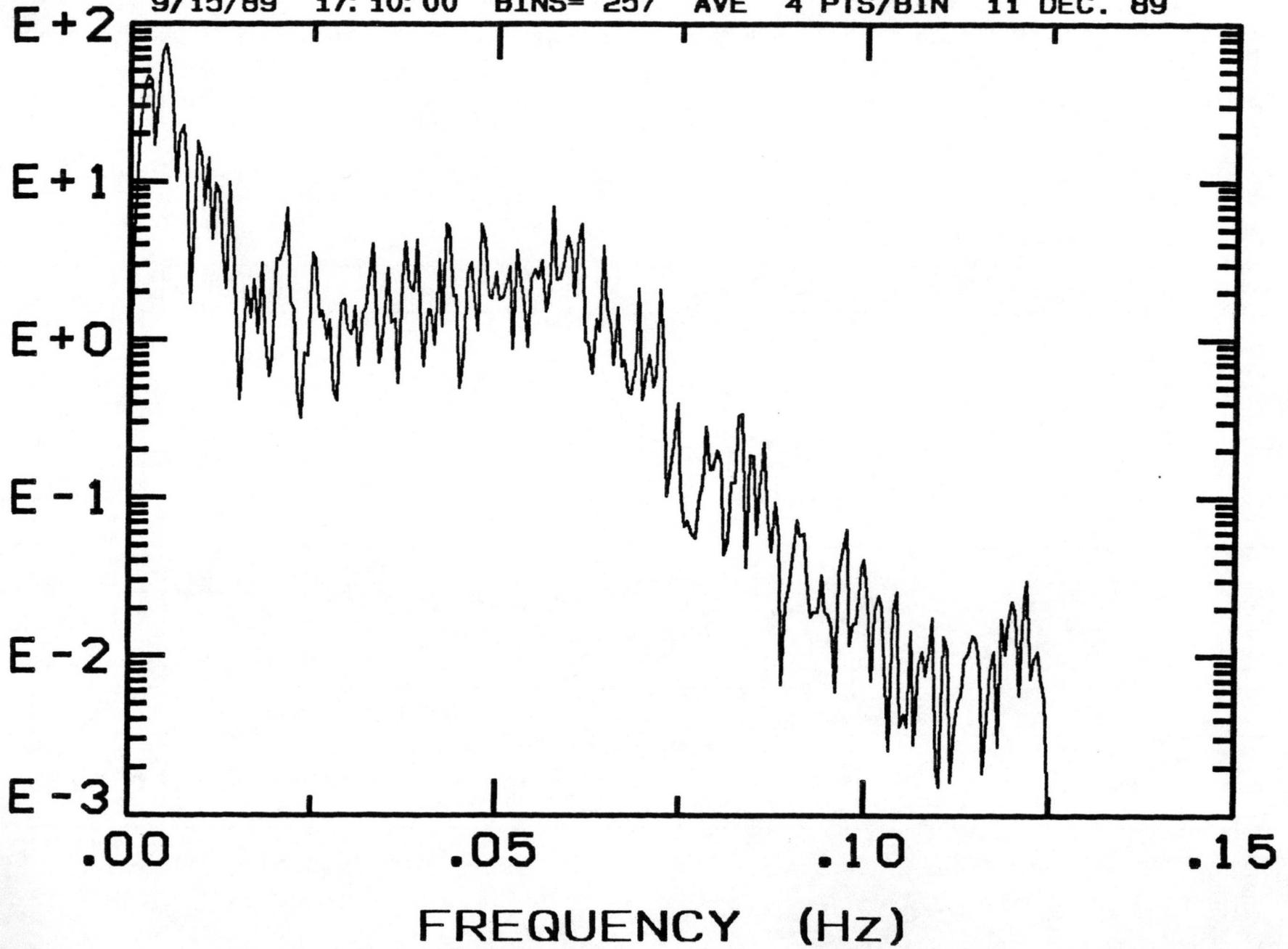
Flight meteorologist: Jeff Masters

9/15/89 17:10:01 -- 17:20:00 AVE 1 PTS/BIN 11 DEC. 89



9/15/89 17:10:00 BINS= 257 AVE 4 PTS/BIN 11 DEC. 89

Power dewpoint



U.S. DEPT. COMM./NOAA/OAO - DATA SECTION WORK FORM NO.1 OROWF1 FILE

|                  |                   |                |
|------------------|-------------------|----------------|
| FLT ID: 890915H  | FM: BARBADOS      | TO: BARBADOS   |
| FLT NO:          | BLK IN: 20:24:40  | ATA: 20:21     |
| ETD: 16:00       | BLK OUT: 16:00:51 | RTD: 16:12     |
| ETE: 9 HRS       | BLK TIME: 4:24    | FLT TIME: 4:11 |
| SPONSOR ORG: HRD | PROGRAM: HURR '89 | PURPOSE: HUGO  |

OAO PERSONNEL

|               |                    |
|---------------|--------------------|
| AC GENZLINGER | SYS ENG GOLDSTEIN  |
| CP MCKIM      | DATA SYS SCHRICKER |
| NAV WHITE     | RADAR RAIN         |
| FE WADE       | BT/ODW             |
| RADIO NUNN    | CLD PHYS           |
| FD MASTERS    | DOPPLER            |

PARTICIPATING SCIENTIST/VISITORS/OAO

| LAST, FIRST NAME | ACTIVITY ON A/C | AFFILIATION |
|------------------|-----------------|-------------|
| BURPEE, B        |                 | HRD         |
| WILLOUGHBY, H    |                 | ↓           |
| MARKS, F         |                 |             |
| BLACK, P         |                 |             |
| DODGE, P         |                 |             |
| McFADDEN         |                 | AOC         |

PROPOSED/ACTUAL MISSION/REMARKS (RECCO, FIXES, STORM, PENET, NHOP #)

NO APU on ground - start system while rolling

NO INS # 1 most of flight

+5.6 / -3.7 gravities in nose accelerometers

No navigator's log

