Met Sensors

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Thank you to all who have provided the met
sensor information already.

Value of Met Sensors

- Pressure
  - directly affects height of site in analysis
  - 1 hPa (mbar) pressure error => 1 mm height
- Temperature
  - thermal deformation of antenna affects height
- Relative humidity
  - may be useful for comparison with wx models

Maximum Error of Met Sensors

- Pressure
  - 0.5 hPa
- Temperature
  - 1° C
- Relative humidity
  - approximately 10%
- How to calibrate? big question!
  - no system-wide method

Calibration of Met Sensors

- Pressure
  - obtain calibration from a manufacturer, a standards laboratory, or a weather service
  - compare with nearby airport
    - correct for height difference using lapse rate
  - compare with data from Numerical Weather Model
- Temperature
  - manufacturer, standards laboratory, or weather service
  - use laboratory grade thermometer
- Relative humidity
  - compare with sling psychrometer

Important Information

- Calibration values (and error bars)
  - Pressure
  - Temperature
  - Relative humidity
- Location
  - position relative to fixed location on antenna
  - accuracy desired
    - 0.5 m vertical
    - 5 m horizontal

Where to put information

- Keep a log at the station
- Update the station configuration file
  - example
  - send to Robert Heinkelmann
- Please send any changes as soon as they are made
  - change in position
  - change in sensor (should be calibrated A.S.A.P.)
  - new calibration

Configuration file example

```
•    Network Station Configuration File
•    International VLBI Service
•    Refer to the instructions in the file
•    ftp://ivscc.gsfc.nasa.gov/config/instructions.txt
•    for how to fill out and submit this form.
•    990624 nrv Form version 0.5
•    990702 nrv Form version 0.6
•    990713 nrv Form version 0.7
•    991020 nrv Form version 0.8
•    0. Form
•      Prepared by (full name) : Michael A. Poirier
•      Date prepared           : 2000-04-15
•      Report type             : new
•    1. Site identification
•      Site name               : Westford Antenna Site
•      Site 8-letter code      : WESTFORD
•      Site 2-letter code(s)   : Wf
•      IERS DOMES number       : 40440S003
•      CDP occupation code     : 72097301
•      CDP monument number     : 41
•      Surveyed into national network? : yes
•      IGS station code        : WES2
•      ILRS station name       :
•      Additional information  :
•    2. Site information
•    2.1 Site location information
•      City or Town            : Westford
•      State or Province       : Massachusetts
•      Country                 : U.S.A.
•      Tectonic plate          : North American
•      Approximate position
•        X coordinate (m)      : 1492206.5970
•        Y coordinate (m)      : -4458130.5170
•        Z coordinate (m)      : 4296015.5320
•        Latitude (deg)        : 42.613 N
•        Longitude (deg)       : 71.494 W
•        Elevation (m)         : 87.77
•        Source of position    : GPS
•        Additional information :
```

```
7 Meteorological instrumentation
7.1 Humidity sensor
   Manufacturer          : Vaisala
   Model                 : hmp233b1b02de12c1a
   Accuracy              :
   Effective dates       : 1998-10 to present
   Additional information : NOAA supplied instruments.
                            Data available on
cddisa.gsfc.nasa.gov/
                            pub/gps/gpsdata/00170/met
7.2 Pressure sensor
   Manufacturer          : Vaisala
   Model                 : ptb220aab1a1
   Accuracy              :
   VLBI - standard (hPa) : -0.2
   Uncertainty (hPa)     : 0.1
   Effective dates       : 1998-10 to present
   Height relative to VLBI :
   Additional information : same as above
7.3 Temperature sensor
   Manufacturer          : Vaisala
   Model                 : hmp233b1b02de12c1a
   Accuracy              :
   VLBI - standard (C)   : 0.3
   Uncertainty (C)       : 0.2
   Effective dates       : 1998-10 to present
   Additional information : same as above
```

Keep calibration information in a log.

We are not yet ready to change configuration files to include calibration values.

Other information

- Contact person for met sensor information
  - Robert Heinkelmann
    Technical University of Vienna
    rob@mars.hg.tuwien.ac.at
  - please cc:
    aniell@haystack.mit.edu