

South Pole Meteorology Instrumentation Timeline

Part II – Barometers

9 January 1957

First barometric instruments installed: Kollsman precision aneroid, Kollsman altimeter setting indicator, and Bendix-Friez 4-day barograph (later listed as a Belfort).

Barometer elevations listed to be same as station elevation: 9186 feet/2800 meters. This elevation was likely calculated by averaging altimeter readings and was not to be changed for many years.

January 1957 (?)

A mercury barometer was installed sometime early in the station history but the exact date is not documented. It was apparently a standard Weather Bureau barometer and was labeled as #219.

16 March 1961

A new mercury barometer, #530, became the official one and #219 was kept as a secondary barometer.

1 August 1963

Barograph had apparently been set to use 12-hour charts by this time; otherwise no change to barometric instruments.

31 December 1965

Report indicates barograph at this time was a Belfort 5-day barograph installed in March 1965. Kollsmans and mercury barometer same as before.

8 January 1968

A new mercury barometer, #49-64, was installed.

1 December 1968

Note concerning mercury barometer on station history form: "Barometer removed from weather station wall and placed on wooden plank inserted into floor and frozen beneath surface under floor independent of building movement."

February 1969

Report indicates that the barograph was the 4-day instrument, now shown as a Belfort that was installed 1/9/57.

18 October 1972

Field, station, and barometer elevations all still listed as 9186 feet. A footnote says this is the average height for a 100-mile radius.

No changes to barometric instruments from 1969.

18 December 1974

Kollsman aneroids, mercury barometer #49-64, and Belfort barograph were moved from Old Pole to the new Weather Bureau office in the science building under the dome.

A new elevation survey was completed by the Navy Navigation Satellite Geodesy. The new station elevation was listed as 9342 feet and the actual barometer elevation was 9347 feet. This was the first update to the elevations since 1957.

1 November 1975

Met operations transferred to the New Zealand Weather Service.

1979 Winter

The primary barometer for station pressure readings at this point was a Bell & Howell digital barometer. The Kollsman aneroid barometer was back-up, however the Kollsman altimeter setting indicator was used during aircraft operations for altimeter setting reports.

The Belfort “precision microbarograph” was also in use with a 4-day chart.

1984 Winter

The digital barometer failed during the winter; observations were then taken from the aneroids. No mention of a mercury barometer.

1984 – 1985 Summer

The broken digital barometer was sent to Pt. Mugu for work and a new one was ordered. Appears as though they had the aneroids and the microbarograph working.

1985 – 1986 Summer

The repaired digital barometer came back but it soon developed new problems. The office had two each of altimeter setting indicators and aneroid barometers. The most reliable altimeter setting indicator and barometer were designated as the primary instruments. All of these instruments were calibrated early in the summer by a Navy Technician.

The two microbarographs were both “erratic.” A new one was ordered and another was borrowed from NOAA that worked more reliably.

The station elevation was listed as 9301 ft. This was to remain the same until 2005.

1987 Summer/Winter

A new microbarograph never arrived and the department continued to use the one borrowed from NOAA.

1990 – 1991 Summer

Princo mercurial barometer was installed: model 453X. It appears as though this was never used as the primary pressure reading but was used for comparison with other

barometric instruments to make sure they were remaining accurate between annual calibrations.

1991 – 1992 Summer/Winter

Pressure sensors included the Kollsman aneroid barometer and altimeter setting indicator, the Princo mercurial barometer, a Belfort microbarograph, and two Omega pressure sensors (model DP283RA). It appears as though the Kollsmans were the primary instruments for observations.

Annual calibration by the Naval Avionics and Electronic Support Unit was not done this summer because the calibration equipment didn't arrive with the technician who came from McMurdo.

1992 – 1993 Summer/Winter

Following the advice of the Navy technician who calibrated the barometers, the "Navy pressure sensor" was used as the primary pressure instrument. This was probably the digital barometer. The Belfort microbarograph was used for local observations and was kept adjusted to match the Navy pressure sensor.

8 December 1993

The "Navy" digital barometer became inoperable on Dec. 8th and was sent to McMurdo for repair. The Kollsman aneroid barometer and the Belfort microbarograph were then used for station pressure readings. The barometers did not get calibrated this year.

The mercurial barometer started leaking mercury and was sent back to the manufacturer for repair.

1 January 1995

A Navy technician calibrated the barometers on station but was unable to calibrate the Omega barometers.

Summer 1994 – 1995

The digital barometer was returned and re-installed. The repaired mercurial barometer was also re-installed at the end of the summer.

January 1996

A Navy technician calibrated the barometers on station but was unable to calibrate the Omega barometers.

9 February 1998

A technician from McMurdo (SPAWAR) checked the calibration of the barometers and found the digital barometer and Kollsman aneroids to be within tolerance. The Omega barometers were way off and thus were not being used for any official observations (although one of them still was used for the Watcher program). The digital barometer was the primary instrument at this time.

16 November 1998

The digital barometer and Kollsman aneroids were calibrated.

17 November 1999

The Handar 555 datalogger was installed with a built-in Setra 270 pressure sensor. Readings from this pressure sensor were sent to the Watcher program and minute data files.

3 December 1999

Navy Calibration Lab personnel calibrated the digital barometer (primary instrument), the Kollsman aneroids, and the one remaining Omega barometer (although this barometer tended to drift off from calibration fairly quickly).

29 November 2001

Navy Calibration Lab personnel arrived on station and calibrated the digital barometer and the Kollsman aneroids.

17 November 2003

The digital barometer and the Kollsman aneroids were calibrated by personnel from the Navy Calibration Lab.

19 January 2004

The FMQ-19 surface observing system was installed. See the Station History Timeline for more information. The FMQ-19 was to become the official observing system in February 2005.

28 May 2004

It was noticed that the Belfort microbarograph chart was running slow, getting behind by about an hour per 6-hour period. Some maintenance work during the month of June corrected this problem.

15 November 2004

Personnel from the Navy Calibration Lab arrived on station and calibrated the digital barometer and Kollsman aneroids.

12 February 2005

The Met department moved from the Science Building in the dome to wing B2 of the new South Pole Station. The first official observation from the AN/FMQ-19 surface observing system was logged at 0150 UTC. See the supplemental document titled “2005 Met Transition” for information about the instrumentation with the FMQ-19. Readings from three identical barometers are averaged for the pressure observations. The Belfort microbarograph was taken out of service at this time.

The station elevation was updated to 9306 ft. This is the highpoint of the skiway. Previously the station elevation had been listed on observation forms as 9301 ft. (the elevation of the geographic pole), however the elevation of the barometer in the dome Met office was 9280 ft. See the supplemental document titled “FMQ-19 Elevation Settings” for more information about station, field and barometer elevations.

1 June 2005

The Belfort microbarograph (with 7-day chart) was brought back online as a backup to the FMQ-19 barometers.

18 November 2005

Steve Kolden from the Navy Calibration Lab arrived on station and calibrated two of the NovaLynx handheld barometers. The three FMQ-19 barometers were checked to a standard and determined to be within calibration limits. Steve brought the old Kollsman aneroid barometer back to the lab for testing; the Kollsman unit had been dropped during construction work in the new Met office in March of 2005.

25 January 2006

The FDCU enclosure that houses the barometers at the Clean Air tower was raised slightly; afterwards a survey determined that the barometers elevations were at 9309.7 feet.

February 2006

An equipment log was added to the department’s Access database for the purpose of documenting preventative maintenance, calibrations, and repair work on Met equipment. Computer issues and data losses can also be recorded in the equipment log.

4 November 2006

A new TDAU server for the FMQ-19 surface observing system was installed in the station’s Network Operations Center (NOC). An upgraded version of the Airport Weather Advisor (AWA) display software was loaded on the new server. This version of the AWA included requested improvements such as displaying station pressure to the tenth of a millibar and reporting six-hourly peak winds.

Concurrent with the AWA upgrade, the FMQ-19 barometer elevations in the configuration were changed from 9309 to 9310 feet to reflect the previous summer’s raising of the FDCU enclosure that houses the barometers. A height change of one foot makes a very small difference in station pressure calculations.

21 November 2006

Personnel from the USAP Calibration Lab performed calibration checks on the FMQ-19 barometers and confirmed that all three instruments were reading very close to their standard.