Argos 3: Experiences with Drifter Data Quality and Management

W. Gary Williams and Isaac Horn

Clearwater Instrumentation Inc.
304 Pleasant St., Watertown, MA 02472
+1 617.924.2708 Fax +1 617.924.2724

Argos 3 Advantages over Argos 2

- Data management
  - Data buffer management by PMT
  - Reduced data volume compared to Argos 2
- Improved data quality
  - >95% data return
  - Check-summed data
  - Accurate time stamping
- Improved system performance
  - No unnecessary data transmitting

Data Management

- PMT receives and manages data from host system.
  - When a new data message is generated by the host system, it is transferred to the PMT which queues the data for the next transmission to a satellite.
  - Data are queued for transmission to take advantage of the satellite pass predicting capabilities of Argos 3.
  - Data are transmitted only when a satellite is overhead from the first in last out (FIFO) queue.

Argos 2 SVP Barometer Example

- Data for 090136 processed for interval of 5 days
- Average daily results 11 KB zipped file:
  - Satellites:
    - 29 satellite passes.
    - 16 locations
  - Messages
    - 960 total messages sent.
    - 129 "unique" because SVPB data have age of data in minutes, same data appear as unique messages as age counts up from 0 to 60 minutes.
    - 117 messages passed internal 8-bit checksum
    - 23 APs per day. AP usually available as soon as a satellite is overhead.
    - 12 messages failed 8-bit check sum in data.

Argos 3 SVP Barometer Example

- Data for 082223 processed for interval of 5 days
- Average daily results 6 KB zipped file:
  - Satellites:
    - 23 satellite passes.
    - 14 locations
  - Messages. Consist of 116 check-summed messages
    - 184 transmitted as estimated from the number of passes and average pass duration and 90 second repetition rate. This is not entirely accurate since some data transmissions to A3 satellite may occur at 1/5 seconds.
    - 16-bit check sum computed by Argos 3 PMT and evaluated by Argos processing: Y or N.

Argos 3 Example Continued

- 116 total messages received. Messages consist of
  - Data messages interspersed with housekeeping messages that allow sufficient transmissions to ensure the maximum possible number of high quality drifter locations.
  - 47 housekeeping messages.
  - 8 data messages failed the check sum.
  - 61 good data messages including 34 "unique" data samples. Since data are internally time-stamped, identical messages now are identified only in the compression index. Do get multiples when message received by more than one satellite.
  - 23+ air pressures per day. AP available as soon as a satellite is overhead. Missed AP usually available from tendency.
  - Data times are at hh:00.

Statistics Summary

ID	Type	Zipped File	Passes	Loc.	Mess_Xmitd	MessRcvd	Unique
090136	Argos 2	11 KB	29	16	960	129	129
082223	Argos 3	6 KB	23	14	184	116	61

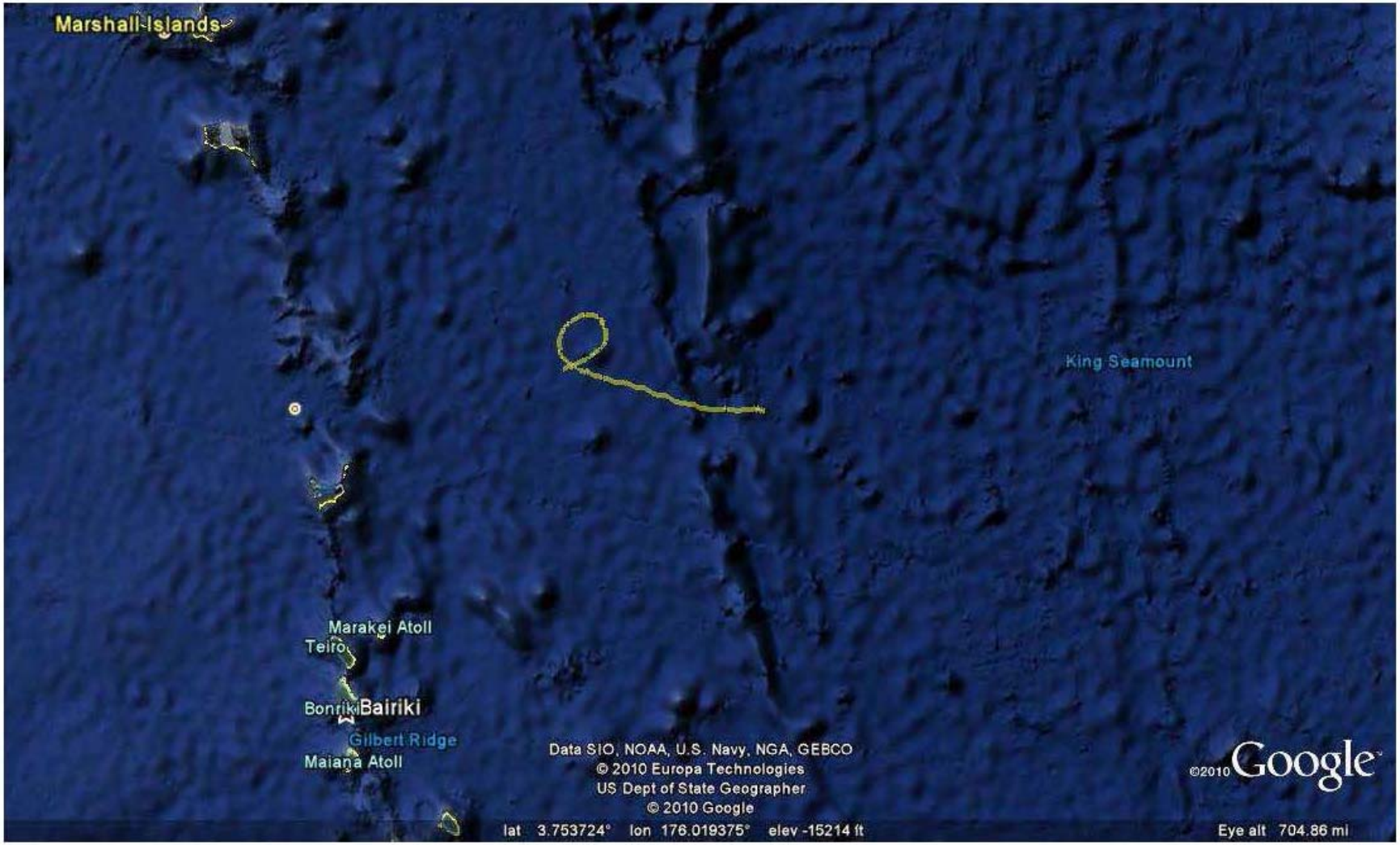
- A2 and A3 almost 100% data recover. 23+ air pressures in 24 hours
- A3 has +/- 1 second controller timing; clock set by A3 downlink message
- A3 message check summed independently from host controller by PMT and CLS
- A3 has accurate time stamp; set from 1 sec accuracy up.
- What data do you need?

In Conclusion

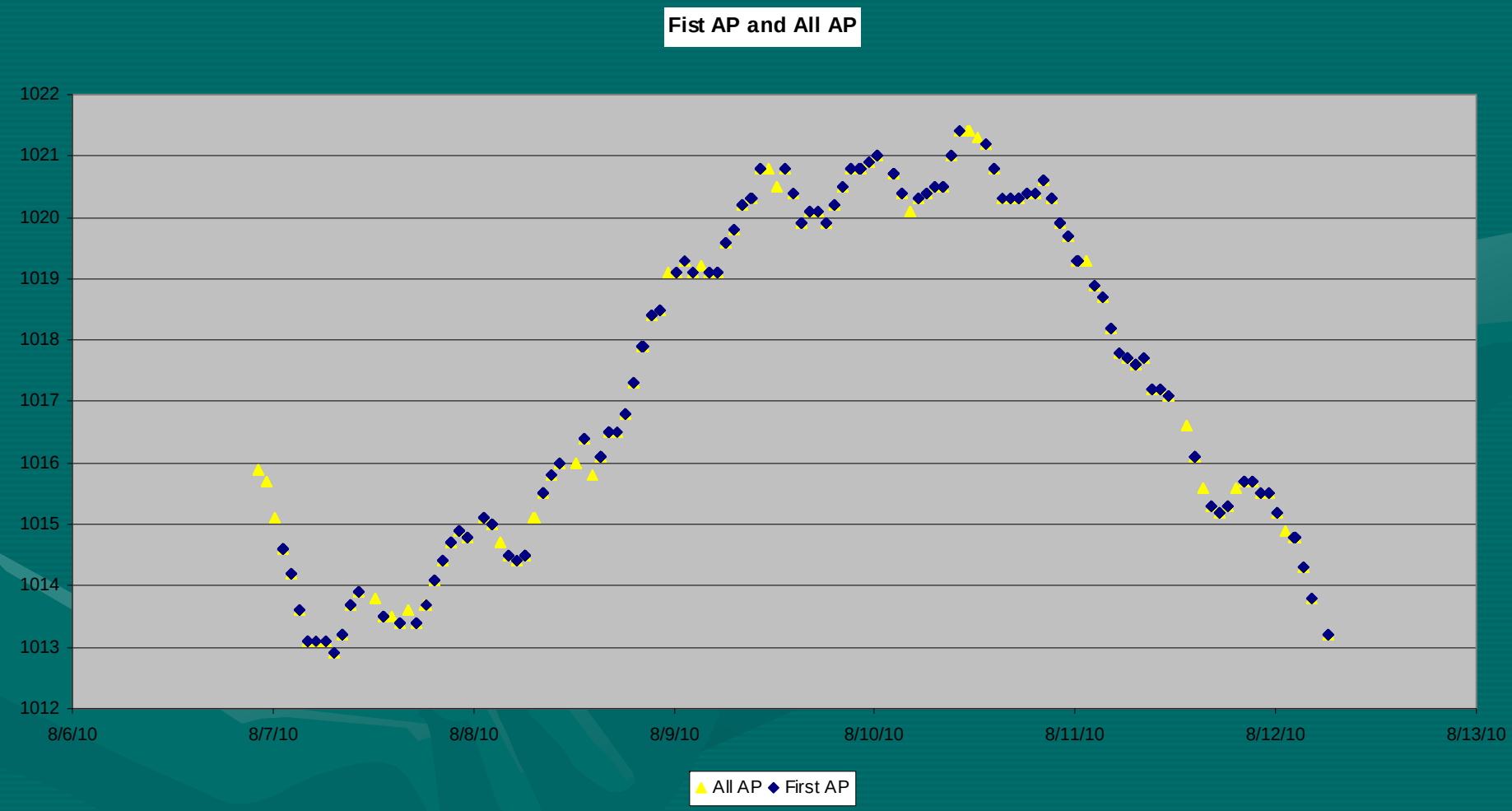
- What data do you want?
  - Argos 3 makes possible specifying and sampling period with a guarantee you will get the data when you wanted it.
  - Concurrent position data is obtained by the addition of GPS
- Next up: in situ control.
  - PMT system parameters
    - Transmitter power: ½, 1, 2, 3 Watts
    - Repetition rate: 30 – 120 seconds
  - Host system parameters:
    - Sampling rates
    - Start/stop sensors
    - Etc.

Go back.

Argos 2 090136 SVP Barometer

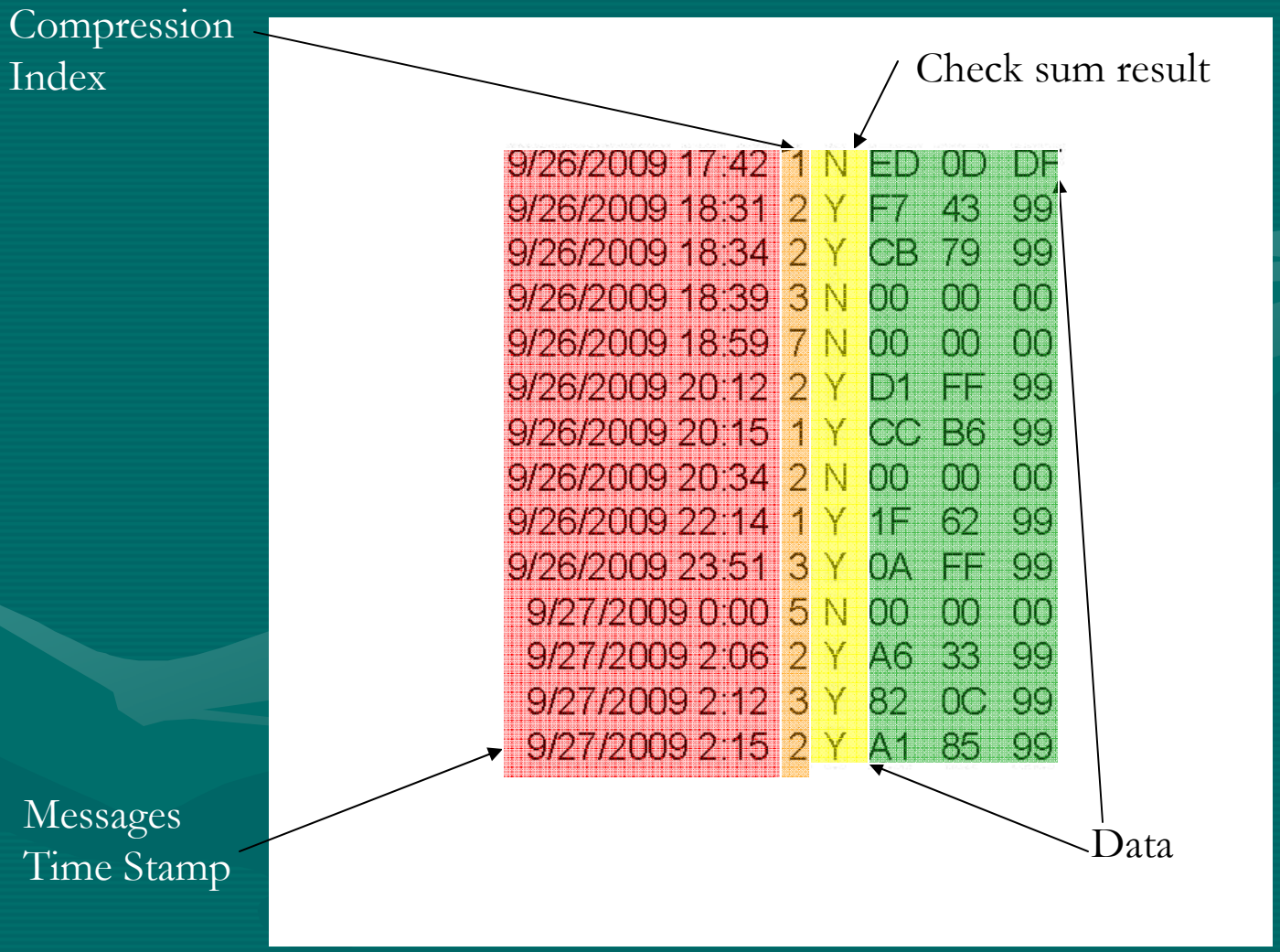


Go back


Fist AP and All AP
1022
1021
1020
1019
1018
1017
1016
1015
1014
1013
1012
8/6/10
8/7/10
8/8/10
8/9/10
8/10/10
8/11/10
8/12/10
8/13/10
All AP
First AP

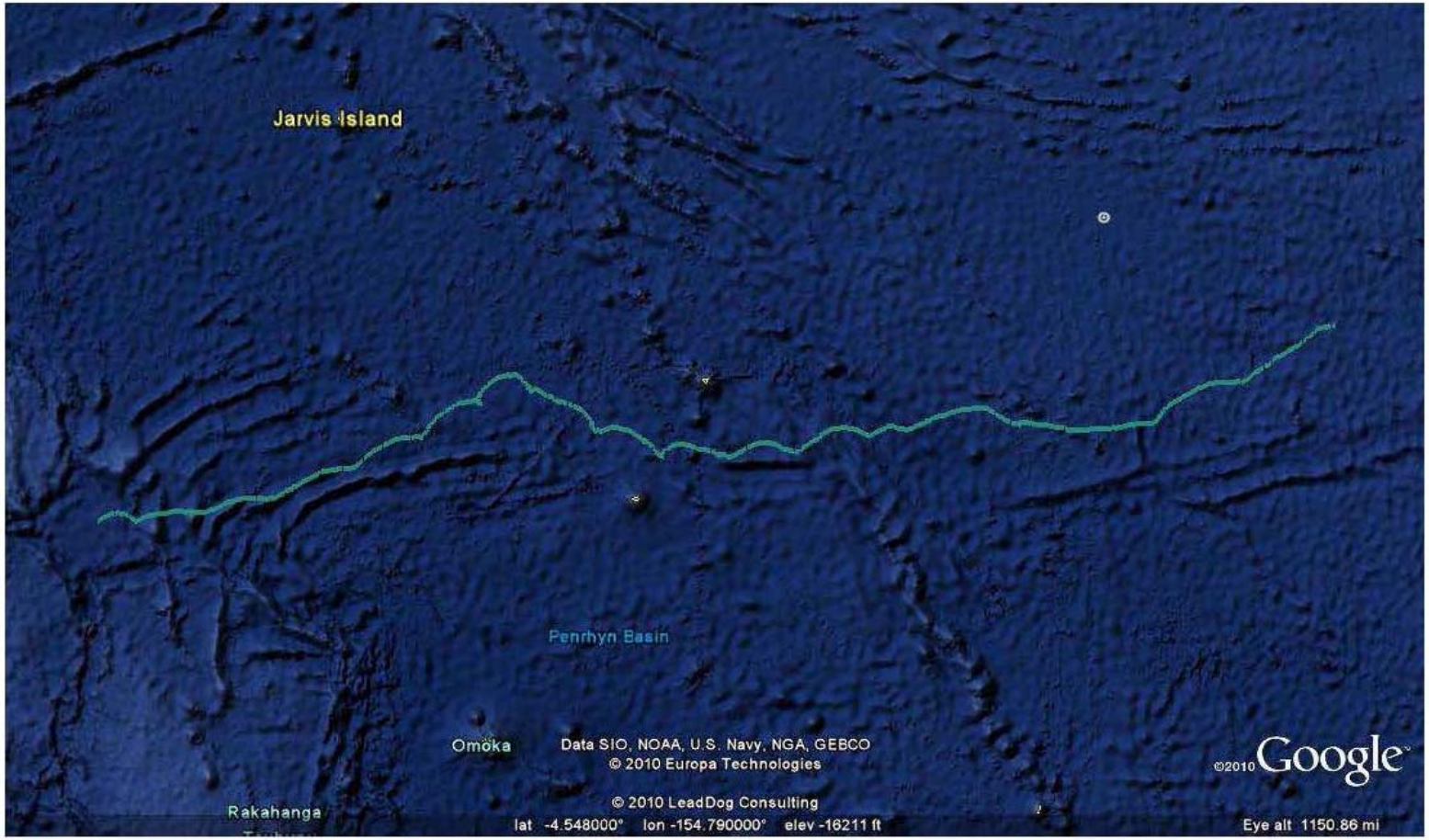
Go back

Argos 3 Data String

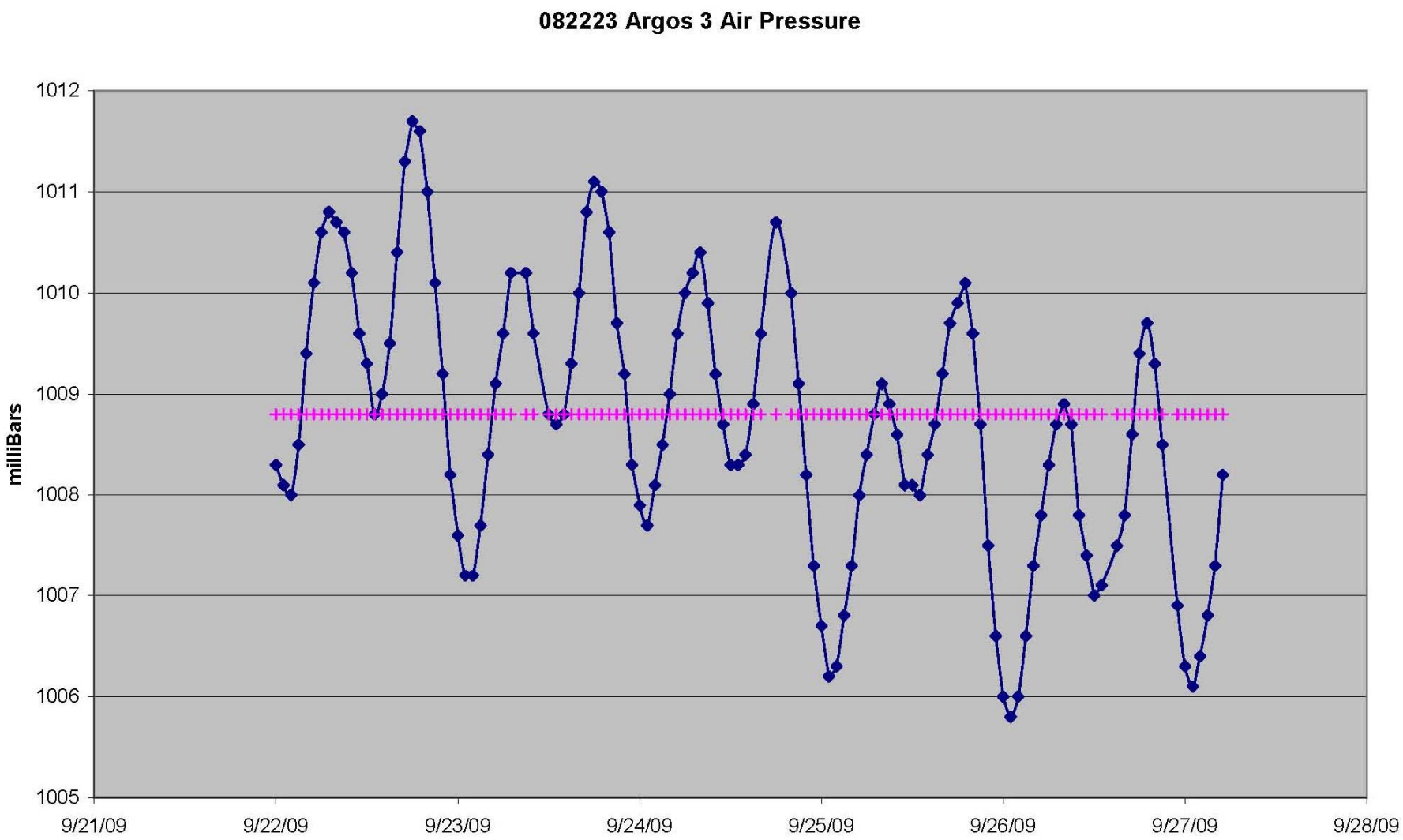


Go back

Argos 3 082223 SVP Barometer



Go back


082223 Argos 3 Air Pressure
milliBars
1012
1011
1010
1009
1008
1007
1006
1005
9/21/09
9/22/09
9/23/09
9/24/09
9/25/09
9/26/09
9/27/09
9/28/09