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QUARTERLY REPORT ON DRIFTING BUOYS IN THE NORTH ATLANTIC

By Sue Holton
January 2002

Report No 60

1st October to 31st December 2001

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21st January 2002

This report has not been published.
Permission to quote from it should be obtained from the
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1. INTRODUCTION

Drifting buoys operated by European countries, the United States, Canada and E.G.O.S. (European Group on Ocean Stations) provide valuable meteorological data in the North Atlantic Ocean. This report is a summary of the performance of these buoys giving information on the number of buoys operating, the accuracy of reported locations and data quality, timeliness and availability. It is compiled by looking at observations received in the Met. Office Meteorological Data Base (Met.D.B.) and by comparisons of observations with background fields from the Met. Office forecast model. Additional information on buoy operations and data quality is extracted from E.G.O.S. Technical Secretariat reports.

2. GENERAL PERFORMANCE

The following few sub-sections describe the general performance of the drifting buoys throughout the quarter.

(a) Location Accuracy

53 out of 60 of the buoys reporting, gave a 'percentage of observations with acceptable positions' greater than 95% (57 out of 58 last quarter).

(b) Data timeliness

(see note 9 of section 6 for definition of terms.)

Timeliness	Last quarter.	This quarter
Very Good	15	19
Good	34	35
Satisfactory	6	4
Poor	1	0
Very poor	2	2
Total no. of buoys	58	60

c) Data availability

(see note 9 of section 6 for definition of terms.)

Availability	South of 50 deg N		North of 50 deg N	
	Previous Quarter	Present Quarter	Previous Quarter	Present Quarter
Very Good	7	7	13	18
Good	15	16	7	2
Satisfactory	9	6	2	5
Poor	5	4	0	1
Very Poor	0	1	0	0

The total number of buoy days in the quarter was 4588 [obtained by summing the number of reporting days for each buoy] (last quarter the total was 4282) and the number of 'buoy hours' with at least one observation was 95928 (compared with 88575 last quarter). Thus, the mean number of hours per day, for days with at least one observation (averaged over all buoys operating in the area) was 20.91 (last quarter the figure was 20.69).

3. SUMMARY OF PRESSURE PERFORMANCE

(a) Buoy deployments, etc.

North of 50deg N

There were 17 buoys reporting at the beginning of the period. 20 buoys were operating at the end of the period.

9 buoys were deployed during the period (44728, 44730, 44742, 44743, 47556, 62520, 62598, 64551 and 64552).

6 buoys ceased reporting (44761, 62514, 62596, 64550, 65516 and 65662).

South of 50deg N

There were 32 buoys reporting at the beginning of the period. 27 buoys were reporting at the end of the period.

2 buoys were deployed during the period (41658 and 41659).

7 buoys ceased reporting (41505, 41639, 41642, 41644, 44613, 44722 and 62505).

(b) Data Quality - Pressure

Revised RMS Differences

The technique used to assess the quality of pressure data in this report is based on the Revised RMS differences between the observations and the background field from the Global Forecast Model (see note 8 in Explanatory Notes). For buoys south of 50°N the Revised RMS differences should be less than (or equal to) 2.0 hPa and for buoys north of 50°N they should be below (or equal to) 3.0 hPa. The buoys whose revised RMS differences were found to lie outside these limits have had their performances described as 'suspect' and are included in the section below. Examination of the time-series plots (see Annex B) indicates the performances of these buoys :-

44624 - Data from this buoy was occasionally erratic during the period.

44625 - Data from this buoy was occasionally erratic during parts of the period.

62510 - Data from this buoy showed both a strong negative and positive bias until it ceased reporting pressure on 05/11/01.

62511 - Data from this buoy developed a negative bias towards the end of the quarter before it ceased reporting pressure on 26/11.

64549 - Data from this buoy was erratic throughout out the period.

Biases

13 buoys (excluding those mentioned in the previous section) showed pressure biases greater than 0.5 hPa (pressure biases are determined using the mean value for unflagged data from Annex A). Those buoys whose pressure data showed a bias of greater than 0.5 hPa have had their performance described as 'suspect'.

WMO No.	Buoy bias (hPa)	Period of reports
41639	1.0	01/10 – 05/12
41658	-0.7	03/11 - -31/12
41659	1.2	03/11 - -31/12
44546	-0.7	01/10 – 31/12
44616	0.6	01/10 – 31/12
44627	-0.6	01/10 – 31/12
44728	-0.6	23/10 – 31/12
44742	0.7	05/11 – 31/12
44743	-0.8	19/12 – 31/12
62512	-0.8	01/10 – 31/12
62514	-0.6	01/10 – 22/11
64550	-0.7	01/10 – 22/11
64551	-0.7	15/11 – 31/12

Summary of Pressure Performance

Pressure Summary	Last Quarter	This Quarter
Acceptable	48	42
Suspect – RMS	1	5
Suspect – Bias	9	13
Total no. of buoys	58	60

4) Air Temperatures

The following table shows the mean and standard deviation of observation minus background differences for air temperatures.

(Note : The calculations below exclude the majority of gross errors. However, gross errors within ± 20 °C of the background value are included. Therefore, in some instances, the figures may be slightly misleading.)

Air Temperature				Air Temperature			
WMO No.	Mean	St.Dev	No. of Obs	WMO No.	Mean	St. Dev	No. of Obs
44613	0.45	0.58	1897	44743	-0.82	2.55	245
44765	0.28	2.17	1486	62598	-0.21	0.82	494
64549	-0.34	1.27	3778	64550	-0.66	1.11	2269
64551	-0.06	0.89	583	65516	-0.28	0.81	4421
65581	-0.23	1.27	4007	65595	-0.05	0.99	4091
65602	-0.16	1.03	4812	65662	-0.22	1.17	3530

Summary

There was no significant **air temperature** bias or but buoy 44765 (2.17) and 44743 (2.55) both showed significant standard deviations for the quarter.

(5) Winds

The following table shows the mean and standard deviation of observation minus background differences for wind speed and direction.

WMO No.	Wind Speed (kt)			Wind Direction (deg)		
	Mean	St. Dev.	No. of Obs	Mean	St. Dev.	No. of Obs
41647	1.34	3.90	2009	-0.81	22.48	1839
41652	1.30	4.68	2054	-4.49	26.68	1857
62520	-0.58	4.73	772	-11.18	27.74	745

Summary

There was no significant **wind speed** or **wind direction** for both means and standard deviations for this quarter.

6. EXPLANATORY NOTES:

1. Buoy owners are as follows,

CA	- Canada	P	- Portugal
F	- France	UK	- United Kingdom
D	- Germany	US	- United States
N	- Norway	IC	- Iceland
NL	- Netherlands	EG	- EGOS
IR	- Ireland		

2. Number of observations received is the number received at Bracknell in the Meteorological Data Base (Met.DB). If identical reports are received which have originated at different Collecting Centres, the earliest one received at Bracknell is stored in the Met.DB.

3. An observation with valid Time and Date is one that contains no coding errors in the Date/Time group.

4. An acceptable position for an observation is within a distance d of the last acceptable position where $d=vt$ and,

v = maximum drift speed = 1/4 knot
 t = time between observations.

5. The percentage of elements present is calculated from the total number of observations received.

6. The delay is (Time of Receipt at Bracknell) - (Time of Observation).

7. The mean number of observations per day is calculated from the total number of observations received divided by the number of days in the period. It therefore includes 'quasi-identical' observations, i.e. those made within a few minutes of one another. For this reason the mean number of hours per day with at least one observation and the % of hour periods without an observation has been included, where an 'hour period' is defined as the period from HH-30 to HH+29 minutes.

8. Mean (OB-BG) is the mean value of (Observation-Background) Pressure, where the Background is the 6-hour forecast from the Global Forecast Model. RMS (OB-BG) is the Root Mean Square value of (Observation- Background) Pressure differences.

Unflagged data are those data used in model analyses.

Flagged data (i.e. unused observations) are those observations of suspect quality and all observations reported by a buoy at a frequency greater than 5 times every 6 hours, with accepted observations being at least one hour apart. Thus, those buoys which report most frequently have a higher percentage of flagged data.

The Mean calculated over Unflagged Data gives an indication of the instrument bias, since any gross errors have been excluded from the calculation.

The Revised RMS is based on all data except for the few that contain gross errors (as indicated on the time-series graphs - see Annex B).

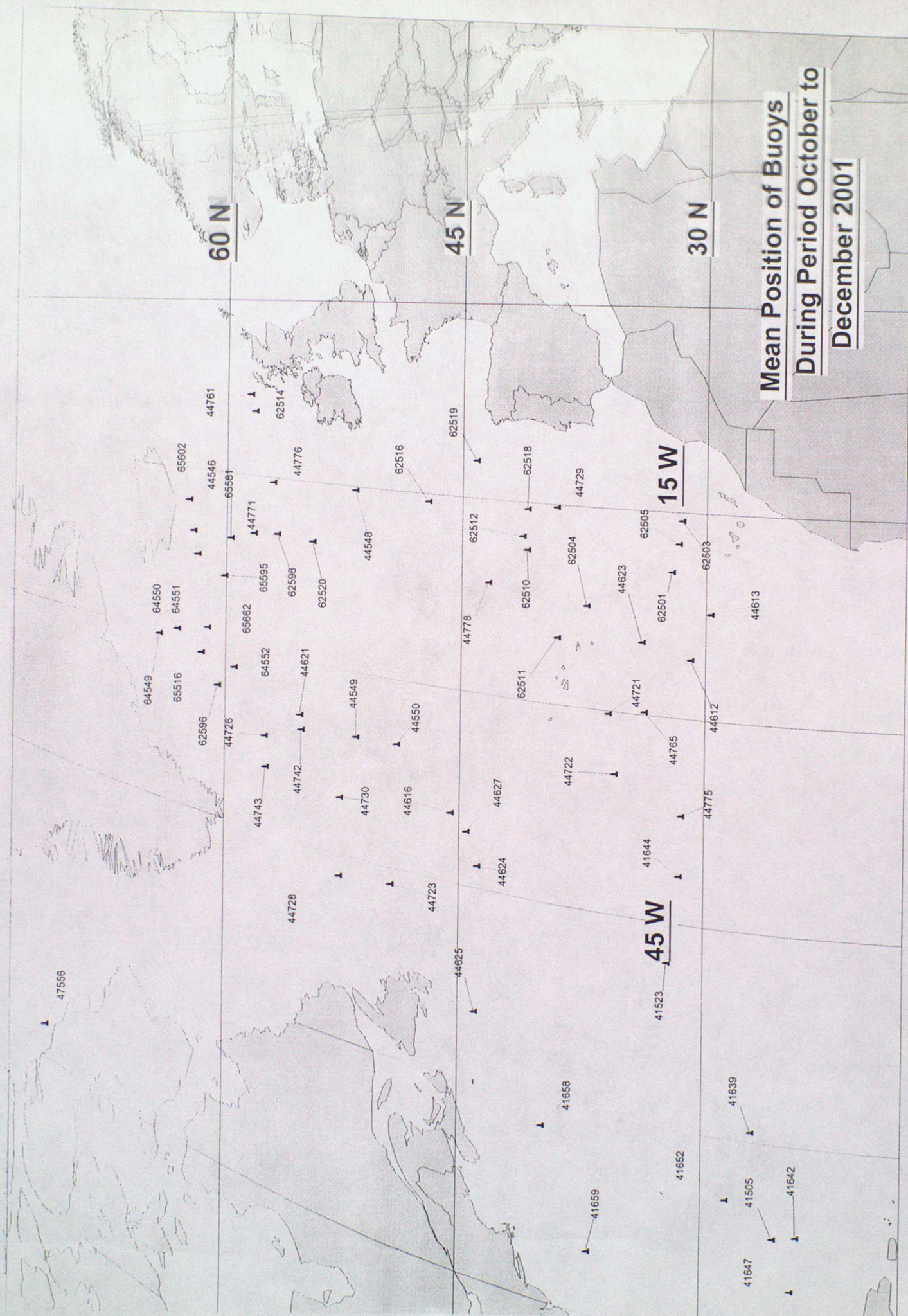
9. The performance categories are defined in the table below.

Performance	Availability (mean no. of obs/day)	Timeliness (median delay in mins)
Very Good	> 35	< 60
Good	25 - 35	60 - 119
Satisfactory	15 - 24	120 - 179
Poor	5 - 14	180 - 239
Very Poor	< 5	> 240

(N.B. WMO requirements state the need for only 4 observations per day from marine stations.)

The pressure quality is assessed from the Revised RMS and the Mean for unflagged data).

Performance	Pressure Quality (in hPa)			
	North of 50 degN		South of 50 degN	
	RMS	MEAN	RMS	MEAN
Acceptable	≤ 3.0	≤ 0.5	≤ 2.0	≤ 0.5
Suspect	> 3.0	> 0.5	> 2.0	> 0.5



Annex A - TABLE OF STATISTICS

WMO No./Country	41505/US	41523/US	41639/US
Argos Id No.	26868	28840	28853
Period Within Area	01/10 - 08/10	01/10 - 31/12	01/10 - 05/12
Mean Latitude	25.6	32.2	27.0
Mean Longitude	-66.7	-47.9	-59.3
No. of Obs Received	37	1271	487
% of obs with Acceptable Position	100.0	100.0	100.0
% of Present Pressure	73.0	93.2	89.7
P. Tendency	0.0	0.0	0.0
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	62.2	93.7	97.5
Median delay (min)	35	33	71
Number of days	8	92	66
Mean No. of obs/day	4.6	13.8	7.4
No. of Hours with obs	35	877	479
Mean no. of hours/day with obs	4.4	9.5	7.3
% of hour periods without an ob	80.6	60.2	69.6
Mean (Ob-Bg)	0.0	0.2	1.0
RMS (Ob-Bg) unflagged data	0.0	1.0	1.3
Mean (Ob-Bg)	-0.2	0.3	0.8
RMS (Ob-Bg) all data	1.1	1.2	8.2
Revised RMS (Ob-Bg)	1.1	1.2	1.4
% of data flagged	0	32	3
Operating at end of period	NO	YES	NO
Performance			
Availability	Very Poor	Poor	Poor
Pressure Quality	Acceptable	Acceptable	Suspect
Timeliness	Very Good	Very Good	Good
Comments			

Annex A - cont'd

WMO No./Country	41642/US	41644/US	41647/US
Argos Id No.	28849	28853	7743
Period Within Area	01/10 - 20/12	01/10 - 11/10	01/10 - 31/12
Mean Latitude	24.2	31.5	24.5
Mean Longitude	-66.4	-41.5	-70.3
No. of Obs Received	749	76	2277
% of obs with Acceptable Position	100.0	100.0	100.0
% of Present Pressure	98.1	75.0	93.2
P. Tendency	0.0	0.0	93.1
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	92.4/ 92.7
Sea-Surface Temp.	98.7	46.1	93.2
Median delay (min)	68	64	130
Number of days	81	11	92
Mean No. of obs/day	9.2	6.9	24.8
No. of Hours with obs	740	54	2014
Mean no. of hours/day with obs	9.1	4.9	21.9
% of hour periods without an ob	61.6	78.6	8.8
Mean (Ob-Bg)	0.2	-0.1	0.1
RMS (Ob-Bg) unflagged data	0.9	0.6	0.7
Mean (Ob-Bg)	0.3	-0.1	0.2
RMS (Ob-Bg) all data	1.1	0.5	0.7
Revised RMS (Ob-Bg)	1.1	0.5	0.7
% of data flagged	2	13	13
Operating at end of period	NO	NO	YES
Performance			
Availability	Poor	Poor	Acceptable
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Good	Good	Acceptable
Comments			

Annex A - cont'd

WMO No./Country	41652/US	41658/US	41659/US
Argos Id No.	7897	16335	16336
Period Within Area	01/10 - 31/12	03/11 - 31/12	03/11 - 31/12
Mean Latitude	28.5	39.8	36.9
Mean Longitude	-64.4	-61.8	-70.3
No. of Obs Received	2339	1330	1329
% of obs with Acceptable Position	100.0	100.0	100.0
% of Present			
Pressure	95.0	97.1	97.7
P. Tendency	95.0	96.7	97.7
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	94.4/ 94.4	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	95.0	97.0	97.9
Median delay (min)	129	102	100
Number of days	92	59	59
Mean No. of obs/day	25.4	22.5	22.5
No. of Hours with obs	2009	1308	1309
Mean no. of hours/day with obs	21.8	22.2	22.2
% of hour periods without an ob	8.9	7.1	7.0
Mean (Ob-Bg)	-0.1	-0.7	1.2
RMS (Ob-Bg) unflagged data	0.9	1.2	1.4
Mean (Ob-Bg)	-0.1	-0.6	1.2
RMS (Ob-Bg) all data	0.9	1.3	1.4
Revised RMS (Ob-Bg)	0.9	1.3	1.4
% of data flagged	16	77	1
Operating at end of period	YES	YES	YES
Performance			
Availability	Good	Acceptable	Acceptable
Pressure Quality	Acceptable	Suspect	Suspect
Timeliness	Acceptable	Good	Good
Comments			

Annex A - cont'd

WMO No./Country	44546/UK	44548/UK	44549/UK
Argos Id No.	25374	27617	22648
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 31/12
Mean Latitude	62.3	51.8	51.6
Mean Longitude	-20.5	-15.3	-35.2
No. of Obs Received	3971	2452	3809
% of obs with Acceptable Position	97.3	97.4	98.1
% of Present Pressure	94.7	86.3	95.0
P. Tendency	94.5	86.1	94.9
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	94.6	86.2	95.0
Median delay (min)	51	124	61
Number of days	92	92	92
Mean No. of obs/day	43.2	26.7	41.4
No. of Hours with obs	2183	1795	2179
Mean no. of hours/day with obs	23.7	19.5	23.7
% of hour periods without an ob	1.1	18.7	1.3
Mean (Ob-Bg)	-0.7	0.2	0.1
RMS (Ob-Bg)	1.2	0.8	1.1
unflagged data			
Mean (Ob-Bg)	-0.7	0.2	0.1
RMS (Ob-Bg)	1.2	0.9	1.3
all data			
Revised RMS (Ob-Bg)	1.2	0.9	1.2
% of data flagged	45	26	43
Operating at end of period	YES	YES	YES
Performance			
Availability	Very Good	Good	Very Good
Pressure Quality	Suspect	Acceptable	Acceptable
Timeliness	Very Good	Acceptable	Acceptable
Comments			

Annex A - cont'd

WMO No./Country	44550/UK	44612/UK	44613/UK
Argos Id No.	23703	27619	28467
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 26/12
Mean Latitude	49.0	30.9	29.7
Mean Longitude	-35.1	-25.7	-22.3
No. of Obs Received	4662	2737	2088
% of obs with Acceptable Position	98.6	92.6	100.0
% of Present Pressure	95.8	96.4	95.5
P. Tendency	95.5	96.3	91.3
Air Temperature	0.0	0.0	95.2
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	95.7	96.3	0.0
Median delay (min)	96	94	68
Number of days	92	92	87
Mean No. of obs/day	50.7	29.8	24.0
No. of Hours with obs	2180	2184	1552
Mean no. of hours/day with obs	23.7	23.7	17.8
% of hour periods without an ob	1.3	1.1	25.6
Mean (Ob-Bg)	-0.3	-0.3	0.0
RMS (Ob-Bg) unflagged data	1.1	0.8	0.6
Mean (Ob-Bg)	-0.3	-0.2	0.0
RMS (Ob-Bg) all data	1.6	1.2	0.6
Revised RMS (Ob-Bg)	1.4	1.2	0.6
% of data flagged	53	21	37
Operating at end of period	YES	YES	NO
Performance			
Availability	Very Good	Good	Acceptable
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Good	Good	Acceptable
Comments			

Annex A - cont'd

WMO No./Country	44616/UK	44621/UK	44623/UK
Argos Id No.	17149	17150	27624
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 31/12
Mean Latitude	45.6	55.2	33.9
Mean Longitude	-39.6	-34.4	-24.7
No. of Obs Received	3284	3786	3245
% of obs with Acceptable Position	98.1	98.3	100.0
% of Present Pressure	95.0	96.1	93.9
P. Tendency	94.8	96.2	93.7
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	95.0	96.2	93.8
Median delay (min)	76	54	144
Number of days	92	92	92
Mean No. of obs/day	35.7	41.2	35.3
No. of Hours with obs	2183	2177	2180
Mean no. of hours/day with obs	23.7	23.7	23.7
% of hour periods without an ob	1.1	1.4	1.3
Mean (Ob-Bg)	0.6	0.2	0.1
RMS (Ob-Bg) unflagged data	1.4	1.0	0.7
Mean (Ob-Bg)	0.7	0.2	0.1
RMS (Ob-Bg) all data	2.2	1.0	0.7
Revised RMS (Ob-Bg)	1.7	1.1	0.7
% of data flagged	34	42	31
Operating at end of period	YES	YES	YES
Performance			
Availability	Very Good	Very Good	Very Good
Pressure Quality	Suspect	Acceptable	Acceptable
Timeliness	Good	Very Good	Acceptable
Comments			

Annex A - cont'd

WMO No./Country	44624/UK	44625/UK	44627/NL
Argos Id No.	177551	177553	136998
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 31/12
Mean Latitude	43.9	44.0	44.6
Mean Longitude	-43.3	-54.5	-40.8
No. of Obs Received	2320	3908	2976
% of obs with Acceptable Position	100.0	98.0	98.6
% of Present Pressure	95.1	98.2	95.2
P. Tendency	95.0	98.1	94.7
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	94.9	98.1	95.2
Median delay (min)	91	71	102
Number of days	92	92	92
Mean No. of obs/day	25.2	42.5	32.3
No. of Hours with obs	2185	2197	2073
Mean no. of hours/day with obs	23.8	23.9	22.5
% of hour periods without an ob	1.0	0.5	6.1
Mean (Ob-Bg)	-0.1	-0.5	-0.6
RMS (Ob-Bg) unflagged data	1.1	1.1	1.2
Mean (Ob-Bg)	-0.3	-0.9	-0.5
RMS (Ob-Bg) all data	2.4	3.3	2.5
Revised RMS (Ob-Bg)	2.1	3.3	1.5
% of data flagged	6	46	31
Operating at end of period	YES	YES	YES
Performance			
Availability	Good	Very Good	Good
Pressure Quality	Suspect	Suspect	Suspect
Timeliness	Good	Good	Good
Comments			

Annex A - cont'd

WMO No./Country	44721/UK	44722/UK	44723/UK
Argos Id No.	18702	18706	21562
Period Within Area	01/10 - 31/12	01/10 - 08/12	01/10 - 31/12
Mean Latitude	35.9	35.5	49.3
Mean Longitude	-30.2	-34.6	-46.3
No. of Obs Received	2839	2067	3624
% of obs with Acceptable Position	94.7	95.6	98.3
% of Present Pressure	94.8	46.7	95.8
P. Tendency	94.6	45.0	95.7
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	94.9	0.0	95.8
Median delay (min)	93	99	69
Number of days	92	69	92
Mean No. of obs/day	30.9	30.0	39.4
No. of Hours with obs	2171	1639	2186
Mean no. of hours/day with obs	23.6	23.8	23.8
% of hour periods without an ob	1.7	0.7	1.0
Mean (Ob-Bg)	0.1	-0.5	-0.1
RMS (Ob-Bg) unflagged data	0.9	0.8	1.0
Mean (Ob-Bg)	0.1	-25.9	-0.1
RMS (Ob-Bg) all data	1.1	66.1	1.2
Revised RMS (Ob-Bg)	1.1	1.4	1.2
% of data flagged	23	39	39
Operating at end of period	YES	NO	YES
Performance			
Availability	Good	Good	Very Good
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Good	Good	Good
Comments			

Annex A - cont'd

WMO No./Country	44726/UK	44728/UK	44729/UK
Argos Id No.	23460	23553	25375
Period Within Area	01/10 - 31/12	23/10 - 31/12	01/10 - 31/12
Mean Latitude	57.5	52.6	39.2
Mean Longitude	-36.9	-46.8	-15.2
No. of Obs Received	3905	2427	2796
% of obs with Acceptable Position	98.0	99.7	97.1
% of Present			
Pressure	94.4	94.7	91.7
P. Tendency	94.1	94.5	91.6
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	94.4	1.7	91.6
Median delay (min)	61	67	94
Number of days	92	70	92
Mean No. of obs/day	42.4	34.7	30.4
No. of Hours with obs	2184	1651	2160
Mean no. of hours/day with obs	23.7	23.6	23.5
% of hour periods without an ob	1.1	1.4	2.2
Mean (Ob-Bg)	0.1	-0.6	0.4
RMS (Ob-Bg) unflagged data	1.2	1.4	1.0
Mean (Ob-Bg)	0.2	-0.5	0.3
RMS (Ob-Bg) all data	1.8	1.7	1.2
Revised RMS (Ob-Bg)	1.3	1.4	1.2
% of data flagged	43	31	23
Operating at end of period	YES	YES	YES
Performance			
Availability	Very Good	Good	Good
Pressure Quality	Acceptable	Suspect	Acceptable
Timeliness	Good	Good	Good
Comments			

Annex A - cont'd

WMO No./Country	44730/UK	44742/UK	44743/D
Argos Id No.	23856	21667	4270
Period Within Area	23/10 - 31/12	05/11 - 31/12	19/12 - 31/12
Mean Latitude	52.6	55.1	57.4
Mean Longitude	-40.4	-35.6	-39.5
No. of Obs Received	2633	2114	264
% of obs with Acceptable Position	99.6	99.6	100.0
% of Present Pressure	95.1	94.7	95.5
P. Tendency	94.8	94.3	89.4
Air Temperature	0.0	0.0	93.2
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	95.0	94.5	80.7
Median delay (min)	71	64	21
Number of days	70	57	13
Mean No. of obs/day	37.6	37.1	20.3
No. of Hours with obs	1657	1335	196
Mean no. of hours/day with obs	23.7	23.4	15.1
% of hour periods without an ob	1.2	2.2	36.6
Mean (Ob-Bg)	-0.2	0.7	-0.8
RMS (Ob-Bg) unflagged data	1.3	1.4	1.6
Mean (Ob-Bg)	-0.1	0.9	-1.0
RMS (Ob-Bg) all data	1.9	2.3	5.5
Revised RMS (Ob-Bg)	1.4	1.8	1.5
% of data flagged	37	37	35
Operating at end of period	YES	YES	YES
Performance			
Availability	Very Good	Very Good	Acceptable
Pressure Quality	Acceptable	Suspect	Suspect
Timeliness	Good	Good	Very Good
Comments			

Annex A - cont'd

WMO No./Country	44761/UK	44765/UK	44771/UK
Argos Id No.	27615	28466	25377
Period Within Area	01/10 - 05/12	01/10 - 31/12	01/10 - 31/12
Mean Latitude	58.6	33.7	58.3
Mean Longitude	-8.1	-29.8	-19.9
No. of Obs Received	2838	1587	3451
% of obs with Acceptable Position	94.3	88.2	97.8
% of Present Pressure	90.4	97.0	84.5
P. Tendency	90.3	93.4	84.5
Air Temperature	0.0	96.6	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	90.3	0.0	84.4
Median delay (min)	57	16	77
Number of days	66	92	92
Mean No. of obs/day	43.0	17.3	37.5
No. of Hours with obs	1549	1106	2057
Mean no. of hours/day with obs	23.5	12.0	22.4
% of hour periods without an ob	1.1	49.8	6.8
Mean (Ob-Bg)	-0.3	0.0	0.3
RMS (Ob-Bg) unflagged data	1.0	0.9	1.0
Mean (Ob-Bg)	-0.3	-0.3	0.3
RMS (Ob-Bg) all data	1.0	5.5	1.1
Revised RMS (Ob-Bg)	1.0	1.2	1.1
% of data flagged	44	39	39
Operating at end of period	NO	YES	YES
Performance			
Availability	Very Good	Acceptable	Very Good
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Acceptable	Very Good	Good
Comments			

Annex A - cont'd

WMO No./Country	44775/UK	44776/UK	44778/UK
Argos Id No.	25372	25371	25370
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 31/12
Mean Latitude	31.4	57.1	43.4
Mean Longitude	-37.1	-15.4	-21.4
No. of Obs Received	2912	3822	3002
% of obs with Acceptable Position	92.4	97.5	97.9
% of Present Pressure	97.1	94.2	95.0
P. Tendency	96.9	93.9	94.8
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	96.9	94.0	94.8
Median delay (min)	85	59	79
Number of days	92	92	92
Mean No. of obs/day	31.7	41.5	32.6
No. of Hours with obs	2189	2179	2169
Mean no. of hours/day with obs	23.8	23.7	23.6
% of hour periods without an ob	0.9	1.3	1.8
Mean (Ob-Bg)	-0.4	-0.4	-0.1
RMS (Ob-Bg) unflagged data	0.9	0.9	1.0
Mean (Ob-Bg) all data	-0.5	-0.4	-0.1
RMS (Ob-Bg) all data	1.2	1.0	1.1
Revised RMS (Ob-Bg)	1.2	1.0	1.1
% of data flagged	26	42	27
Operating at end of period	YES	YES	YES
Performance			
Availability	Good	Very Good	Good
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Good	Very Good	Good
Comments			

Annex A - cont'd

WMO No./Country	47556/CA	62501/F	62503/F
Argos Id No.	1106	7139	17926
Period Within Area	01/11 - 31/12	01/10 - 31/12	01/10 - 31/12
Mean Latitude	72.3	32.1	31.5
Mean Longitude	-72.0	-19.4	-15.6
No. of Obs Received	1155	2592	2677
% of obs with Acceptable Position	98.4	96.8	95.5
% of Present Pressure	100.0	93.0	95.0
P. Tendency	0.0	92.7	95.0
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	0.0	92.7	95.1
Median delay (min)	11	114	95
Number of days	61	92	92
Mean No. of obs/day	18.9	28.2	29.1
No. of Hours with obs	861	2135	2174
Mean no. of hours/day with obs	14.1	23.2	23.6
% of hour periods without an ob	40.5	3.3	1.5
Mean (Ob-Bg)	-0.1	0.3	-0.5
RMS (Ob-Bg) unflagged data	0.9	0.7	0.8
Mean (Ob-Bg)	-0.2	0.3	-0.5
RMS (Ob-Bg) all data	0.9	4.2	0.8
Revised RMS (Ob-Bg)	0.9	0.9	0.8
% of data flagged	43	16	18
Operating at end of period	YES	YES	YES
Performance			
Availability	Acceptable	Good	Good
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Very Good	Good	Good
Comments			

Annex A - cont'd

WMO No./Country	62504/F	62505/F	62510/F
Argos Id No.	17928	17929	26748
Period Within Area	01/10 - 31/12	01/10 - 01/11	01/10 - 31/12
Mean Latitude	37.3	31.7	41.0
Mean Longitude	-22.4	-17.3	-18.6
No. of Obs Received	3163	931	1540
% of obs with Acceptable Position	96.6	97.3	100.0
% of Present Pressure	92.6	84.0	47.9
P. Tendency	92.2	83.9	0.0
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	92.3	41.7	68.6
Median delay (min)	110	114	301
Number of days	92	32	92
Mean No. of obs/day	34.4	29.1	16.7
No. of Hours with obs	2161	743	1095
Mean no. of hours/day with obs	23.5	23.2	11.9
% of hour periods without an ob	2.1	1.6	50.2
Mean (Ob-Bg)	-0.2	-0.4	-0.1
RMS (Ob-Bg) unflagged data	0.7	0.7	2.1
Mean (Ob-Bg)	-0.2	-0.4	-3.3
RMS (Ob-Bg) all data	0.7	0.7	7.2
Revised RMS (Ob-Bg)	0.7	0.7	7.2
% of data flagged	32	18	58
Operating at end of period	YES	NO	YES
Performance			
Availability	Good	Good	Acceptable
Pressure Quality	Acceptable	Acceptable	Suspect
Timeliness	Good	Good	Very Poor
Comments			

Annex A - cont'd

WMO No./Country	62511/F	62512/F	62514/F
Argos Id No.	26751	28692	7119
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 22/11
Mean Latitude	39.1	41.3	58.3
Mean Longitude	-25.0	-17.6	-9.5
No. of Obs Received	3366	3375	2202
% of obs with Acceptable Position	100.0	97.2	80.9
% of Present Pressure	83.1	91.6	84.5
P. Tendency	0.0	91.4	84.2
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	45.8	91.6	84.3
Median delay (min)	482	113	63
Number of days	92	92	53
Mean No. of obs/day	36.6	36.7	41.5
No. of Hours with obs	1745	2140	1239
Mean no. of hours/day with obs	19.0	23.3	23.4
% of hour periods without an ob	20.9	3.1	2.2
Mean (Ob-Bg)	-0.3	-0.8	-0.6
RMS (Ob-Bg) unflagged data	0.9	1.2	1.2
Mean (Ob-Bg)	-0.9	-0.8	-0.6
RMS (Ob-Bg) all data	2.9	1.3	1.4
Revised RMS (Ob-Bg)	2.9	1.3	1.2
% of data flagged	42	36	42
Operating at end of period	YES	YES	NO
Performance Availability	Very Good	Very Good	Very Good
Pressure Quality	Suspect	Suspect	Suspect
Timeliness	Very Poor	Good	Good
Comments			

Annex A - cont'd

WMO No./Country	62516/F	62518/F	62519/F
Argos Id No.	28696	28697	28698
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 31/12
Mean Latitude	47.2	41.0	44.2
Mean Longitude	-15.6	-15.5	-12.1
No. of Obs Received	3010	2840	2707
% of obs with Acceptable Position	95.2	97.1	89.2
% of Present Pressure	91.3	92.4	88.8
P. Tendency	91.1	92.1	88.6
Air Temperature	0.0	0.0	0.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	91.3	92.3	12.2
Median delay (min)	93	98	95
Number of days	92	92	92
Mean No. of obs/day	32.7	30.9	29.4
No. of Hours with obs	2138	2152	2157
Mean no. of hours/day with obs	23.2	23.4	23.4
% of hour periods without an ob	3.2	2.5	2.3
Mean (Ob-Bg)	-0.2	-0.3	0.1
RMS (Ob-Bg) unflagged data	1.1	1.0	1.1
Mean (Ob-Bg)	-0.1	-0.2	-0.1
RMS (Ob-Bg) all data	1.9	2.0	4.0
Revised RMS (Ob-Bg)	1.5	1.2	1.8
% of data flagged	29	23	19
Operating at end of period	YES	YES	YES
Performance			
Availability	Good	Good	Good
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Good	Good	Good
Comments			

Annex A - cont'd

WMO No./Country	62520/F	62596/NL	62598/N
Argos Id No.	32783	16391	2294
Period Within Area	19/11 - 31/12	01/10 - 18/12	23/11 - 31/12
Mean Latitude	54.5	60.6	56.8
Mean Longitude	-19.9	-33.6	-19.7
No. of Obs Received	957	3185	607
% of obs with Acceptable Position	100.0	97.1	99.8
% of Present Pressure	82.5	93.0	86.8
P. Tendency	82.7	92.6	82.0
Air Temperature	0.0	0.0	82.9
Wind Speed/Dir	82.2/ 82.1	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	82.9	92.8	78.6
Median delay (min)	95	66	27
Number of days	43	79	39
Mean No. of obs/day	22.3	40.3	15.6
No. of Hours with obs	903	1738	490
Mean no. of hours/day with obs	21.0	22.0	12.6
% of hour periods without an ob	12.5	7.6	46.5
Mean (Ob-Bg)	0.2	-0.3	-0.3
RMS (Ob-Bg) unflagged data	0.9	1.2	1.2
Mean (Ob-Bg)	0.2	-0.2	-0.3
RMS (Ob-Bg) all data	0.9	4.5	1.1
Revised RMS (Ob-Bg)	0.9	1.2	1.1
% of data flagged	4	46	28
Operating at end of period	YES	NO	YES
Performance			
Availability	Acceptable	Very Good	Acceptable
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Good	Good	Very Good
Comments			

Annex A - cont'd

WMO No./Country	64549/N	64550/D	64551/D
Argos Id No.	3678	4270	6669
Period Within Area	01/10 - 31/12	01/10 - 22/11	15/11 - 31/12
Mean Latitude	64.5	63.3	62.0
Mean Longitude	-30.3	-29.5	-22.5
No. of Obs Received	4879	2417	701
% of obs with Acceptable Position	97.7	99.4	99.7
% of Present Pressure	84.9	97.5	86.3
P. Tendency	68.8	95.8	81.5
Air Temperature	79.7	96.3	85.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	81.9	89.3	78.0
Median delay (min)	18	14	35
Number of days	92	53	47
Mean No. of obs/day	53.0	45.6	14.9
No. of Hours with obs	1789	1017	542
Mean no. of hours/day with obs	19.4	19.2	11.5
% of hour periods without an ob	18.9	19.1	51.3
Mean (Ob-Bg)	-0.5	-0.7	-0.7
RMS (Ob-Bg) unflagged data	1.8	1.9	2.0
Mean (Ob-Bg)	-1.1	-0.7	-0.8
RMS (Ob-Bg) all data	4.8	3.6	2.1
Revised RMS (Ob-Bg)	3.6	2.0	2.1
% of data flagged	71	67	33
Operating at end of period	YES	NO	YES
Performance			
Availability	Very Good	Very Good	Poor
Pressure Quality	Suspect	Suspect	Suspect
Timeliness	Very Good	Very Good	Very Good
Comments			

Annex A - cont'd

WMO No./Country	64552/UK	65516/N	65581/IR
Argos Id No.	21104	3677	6666
Period Within Area	20/12 - 31/12	01/10 - 02/12	01/10 - 31/12
Mean Latitude	59.5	61.7	59.8
Mean Longitude	-31.7	-31.1	-20.6
No. of Obs Received	261	4661	4357
% of obs with Acceptable Position	100.0	98.0	97.6
% of Present Pressure	100.0	96.9	94.1
P. Tendency	99.6	71.9	90.9
Air Temperature	0.0	96.9	94.0
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	100.0	81.4	83.2
Median delay (min)	56	16	18
Number of days	12	63	92
Mean No. of obs/day	21.8	74.0	47.4
No. of Hours with obs	261	1314	1708
Mean no. of hours/day with obs	21.8	20.9	18.6
% of hour periods without an ob	6.5	12.1	22.4
Mean (Ob-Bg)	-0.4	-0.3	-0.5
RMS (Ob-Bg) unflagged data	0.8	1.1	1.2
Mean (Ob-Bg)	-0.4	-0.3	-0.7
RMS (Ob-Bg) all data	0.9	2.6	4.3
Revised RMS (Ob-Bg)	0.9	1.2	1.6
% of data flagged	1	77	69
Operating at end of period	YES	NO	YES
Performance			
Availability	Acceptable	Very Good	Very Good
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Very Good	Very Good	Very Good
Comments			

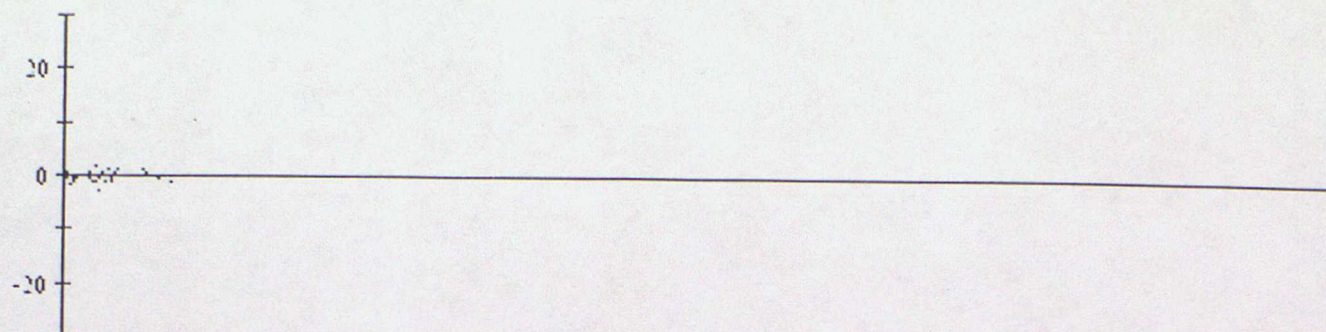
Annex A - cont'd

WMO No./Country	65595/NL	65602/IR	65662/D
Argos Id No.	4229	6667	9307
Period Within Area	01/10 - 31/12	01/10 - 31/12	01/10 - 17/12
Mean Latitude	60.2	62.6	61.3
Mean Longitude	-24.0	-17.8	-28.8
No. of Obs Received	4471	5218	3846
% of obs with Acceptable Position	100.0	99.2	97.2
% of Present Pressure	94.6	94.6	94.2
P. Tendency	91.1	92.2	91.5
Air Temperature	93.7	94.3	93.9
Wind Speed/Dir	0.0/ 0.0	0.0/ 0.0	0.0/ 0.0
Sea-Surface Temp.	70.8	84.1	84.2
Median delay (min)	23	18	17
Number of days	92	92	78
Mean No. of obs/day	48.6	56.7	49.3
No. of Hours with obs	1797	1858	1450
Mean no. of hours/day with obs	19.5	20.2	18.6
% of hour periods without an ob	18.5	15.7	21.9
Mean (Ob-Bg)	-0.1	-0.5	-0.3
RMS (Ob-Bg) unflagged data	1.1	1.3	1.1
Mean (Ob-Bg)	-0.1	-0.6	-0.3
RMS (Ob-Bg) all data	3.7	3.0	2.5
Revised RMS (Ob-Bg)	1.2	1.3	1.4
% of data flagged	66	71	71
Operating at end of period	YES	YES	NO
Performance			
Availability	Very Good	Very Good	Very Good
Pressure Quality	Acceptable	Acceptable	Acceptable
Timeliness	Very Good	Very Good	Very Good
Comments			

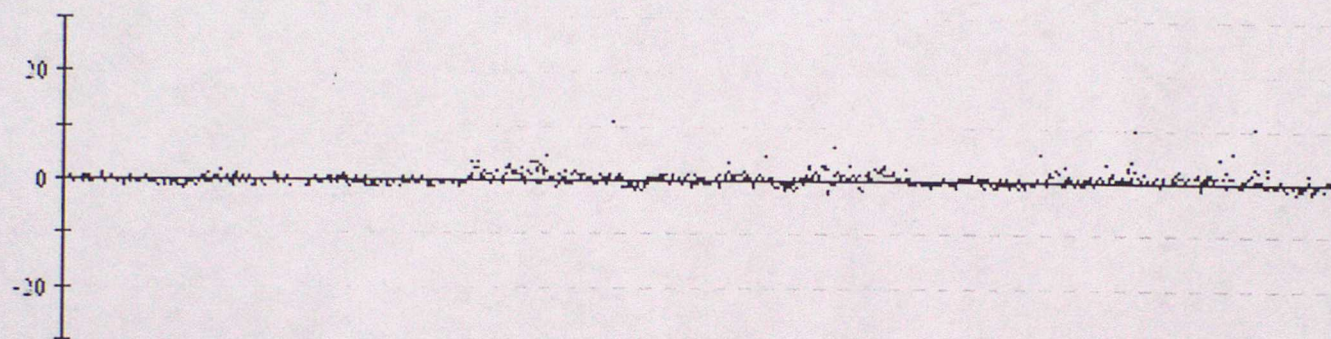
ANNEX B - TIME SERIES PLOTS OF PRESSURE

Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

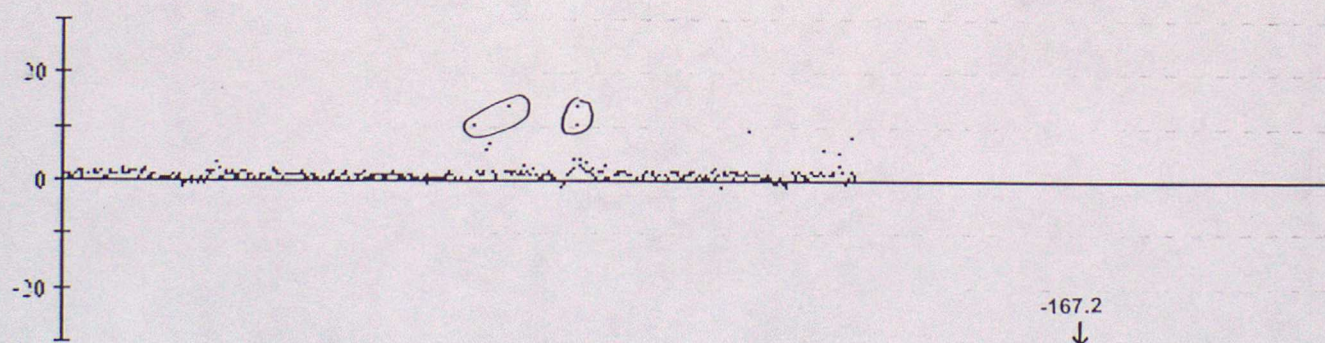
41505 Pressure



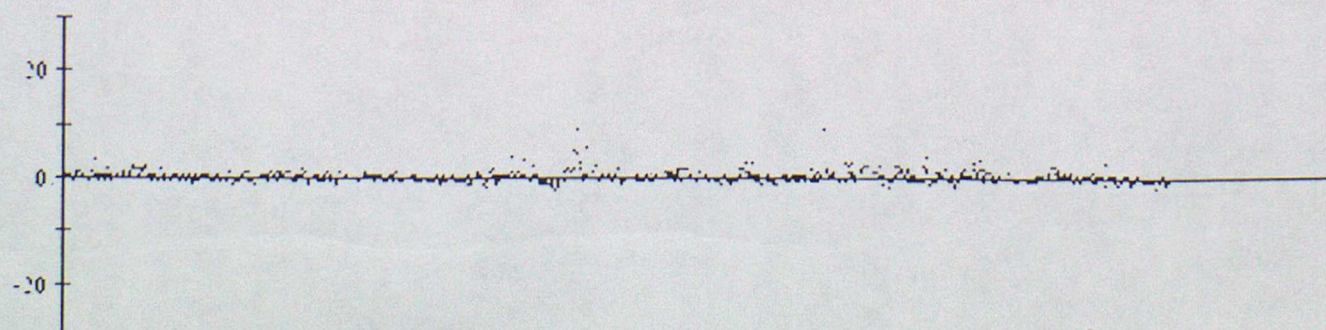
41523 Pressure



41639 Pressure

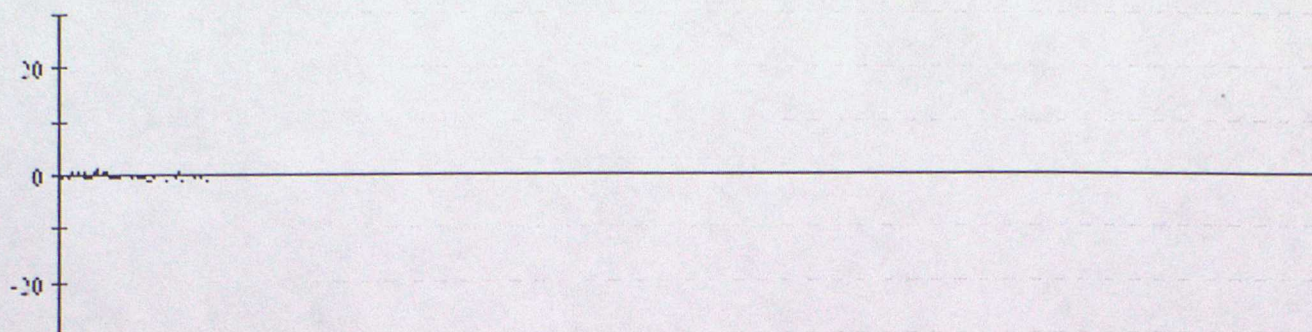


41642 Pressure

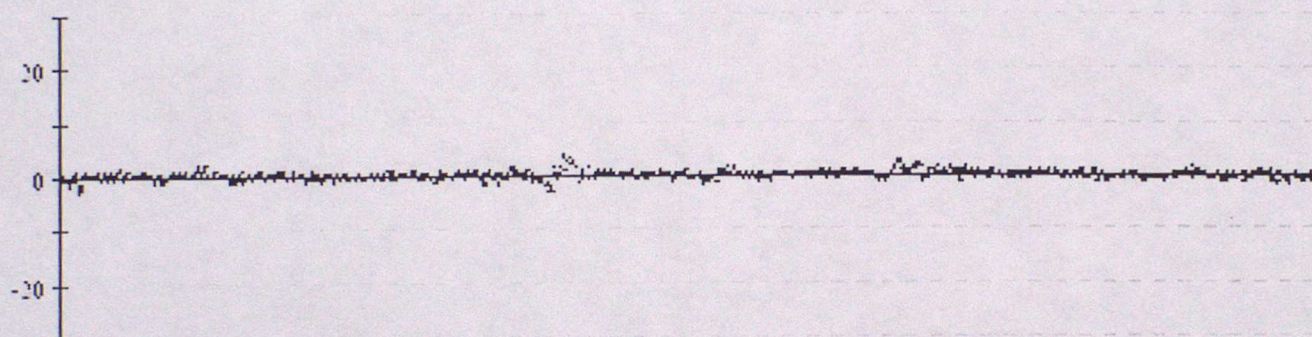


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

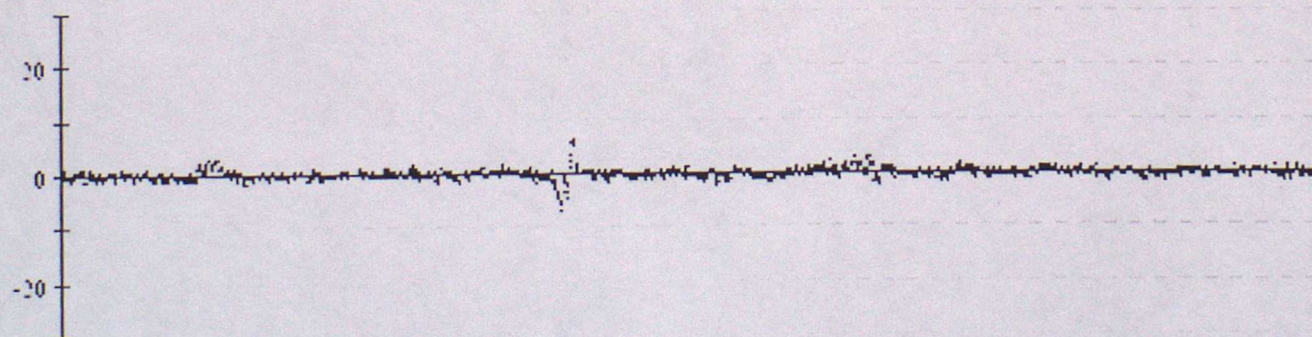
41644 Pressure



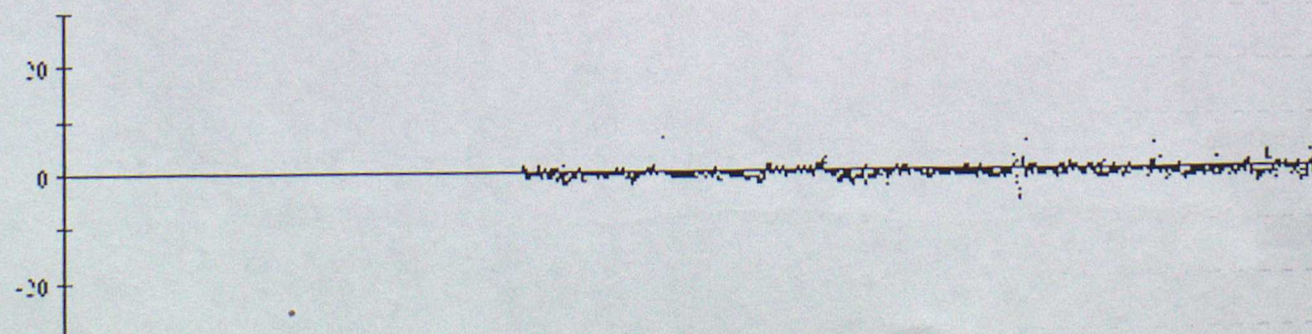
41647 Pressure



41652 Pressure

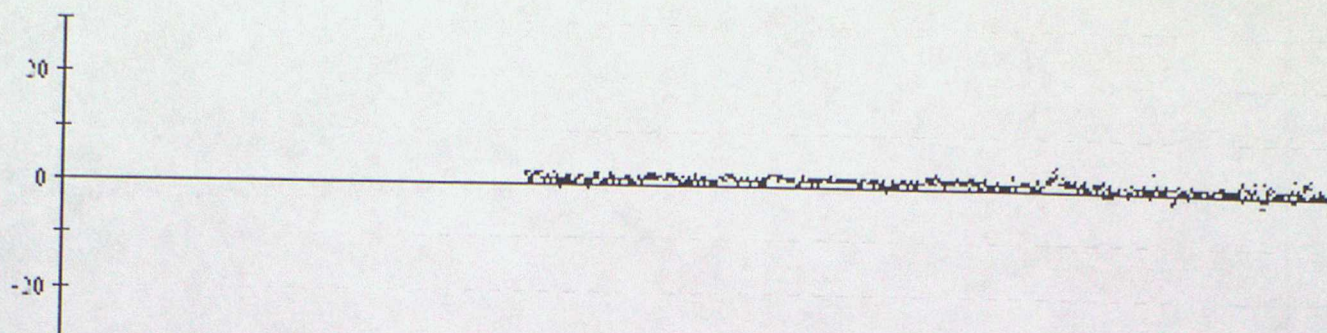


41658 Pressure

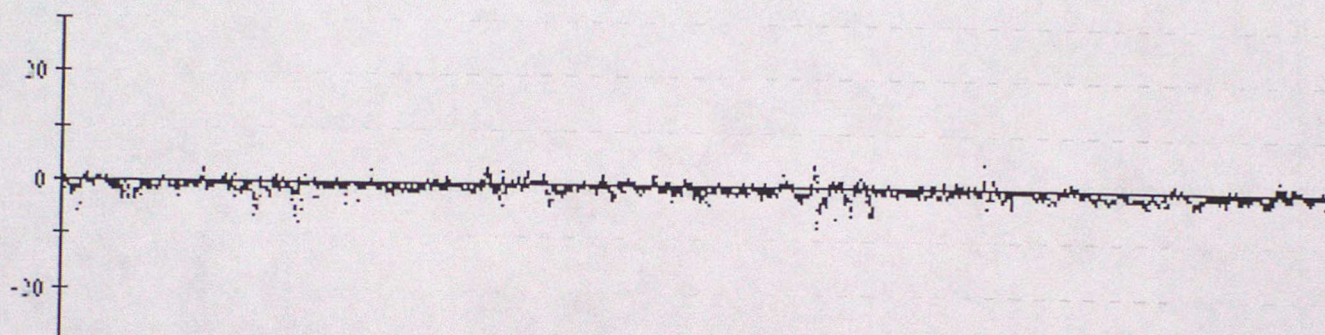


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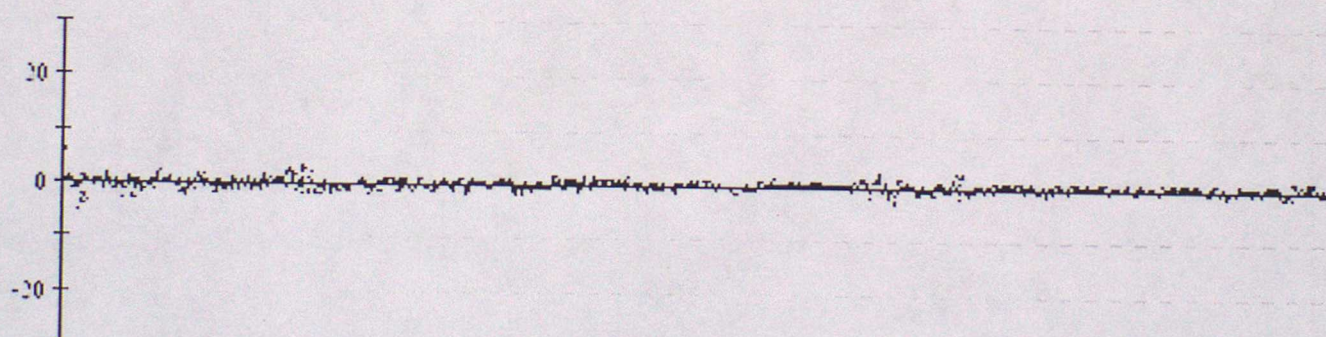
41659 Pressure



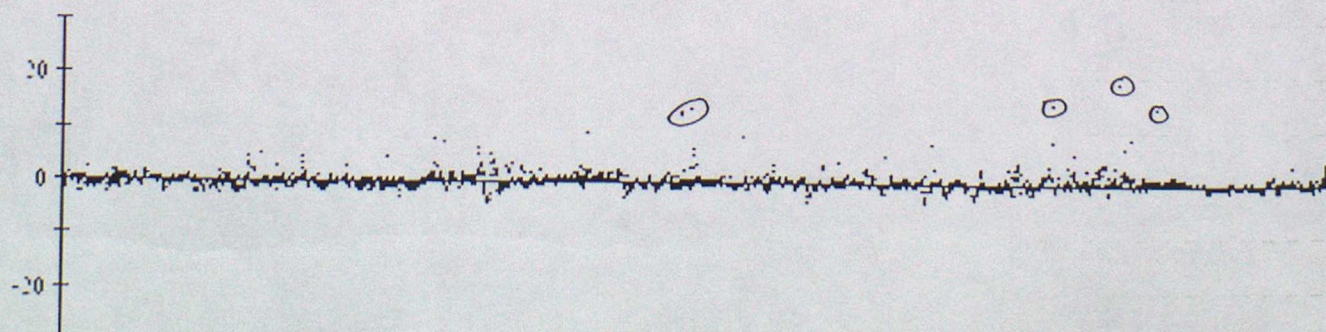
44546 Pressure



44548 Pressure

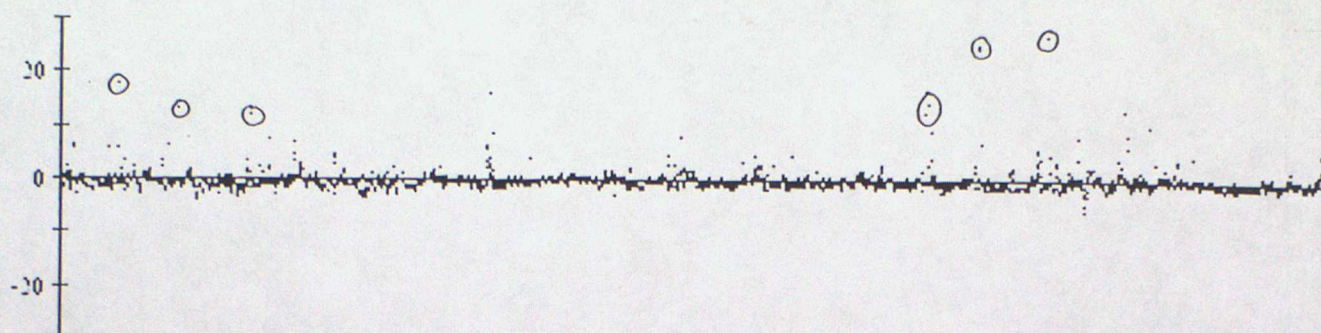


44549 Pressure

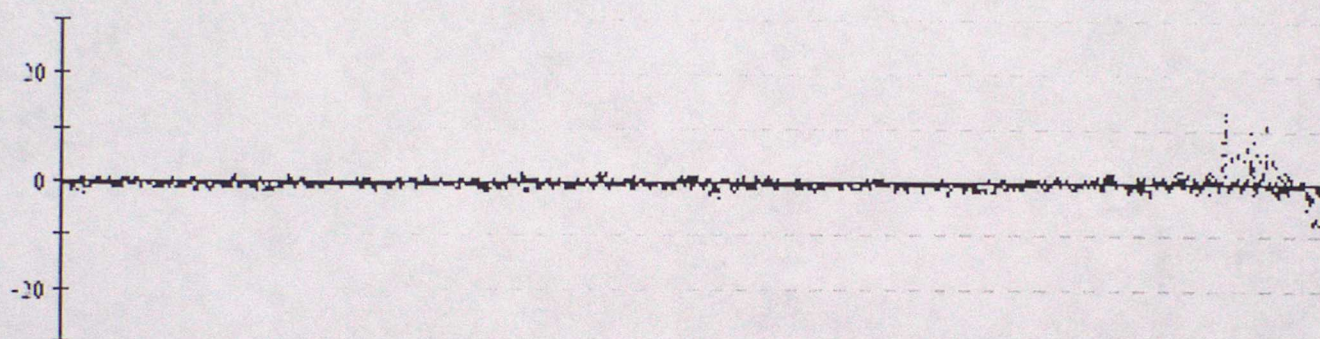


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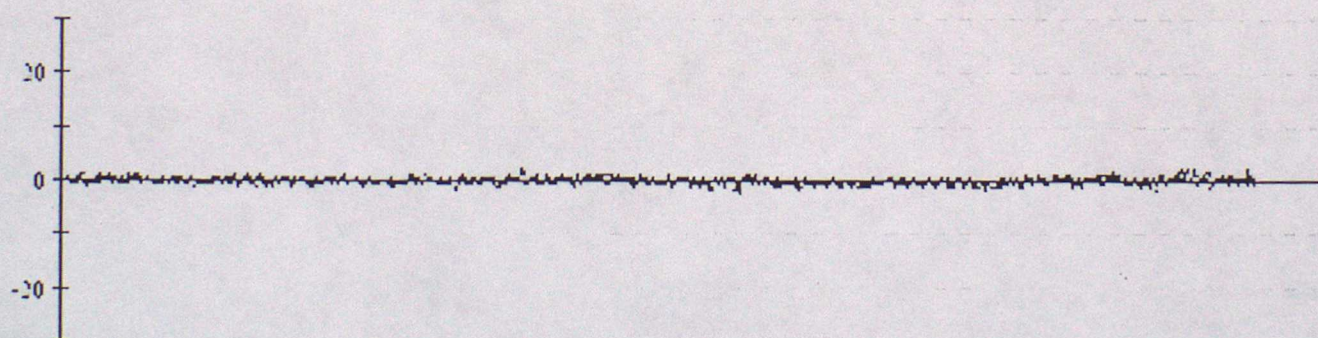
44550 Pressure



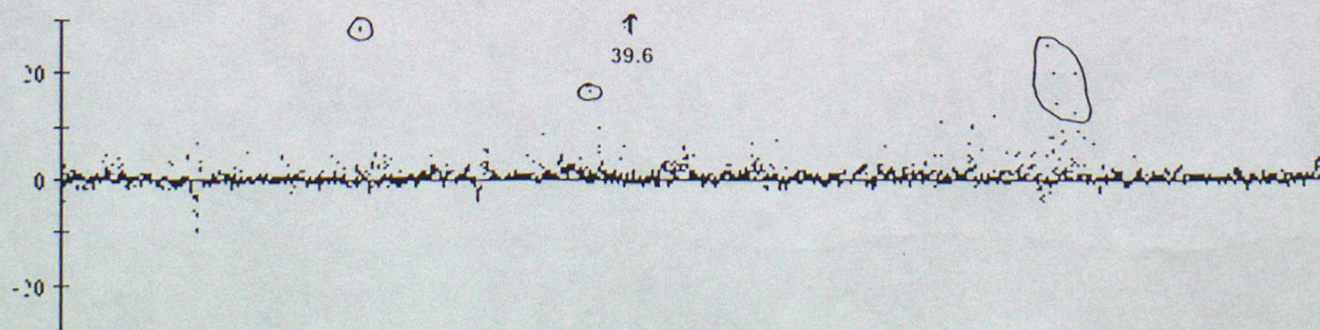
44612 Pressure



44613 Pressure

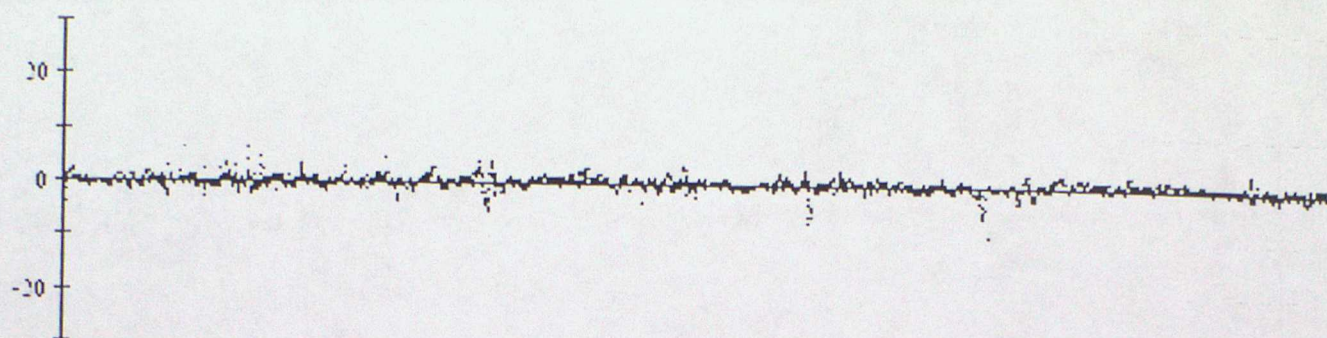


44616 Pressure

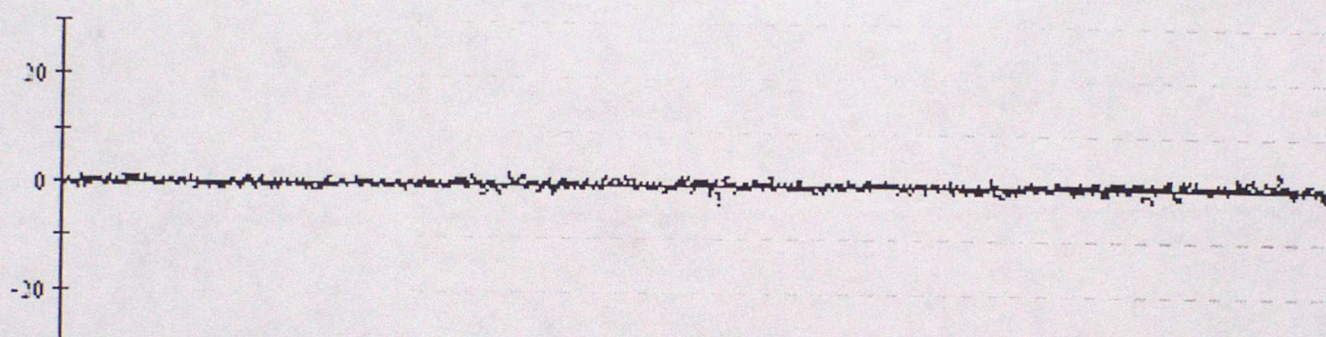


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

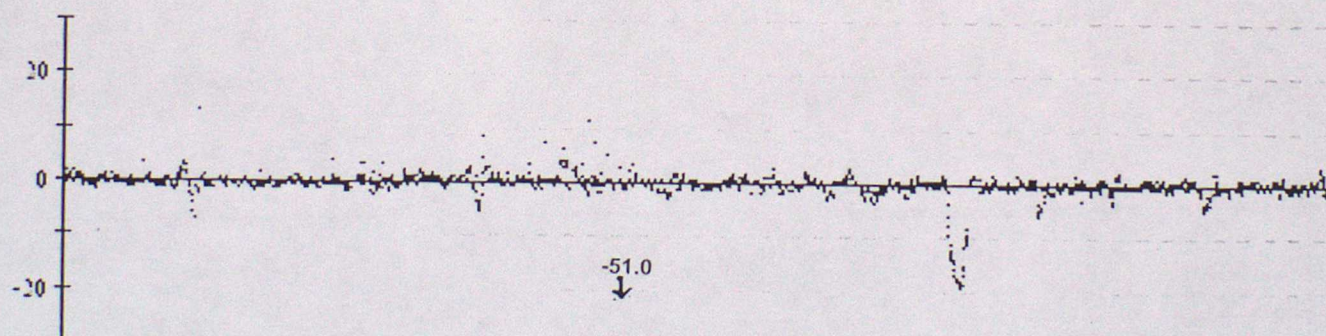
44621 Pressure



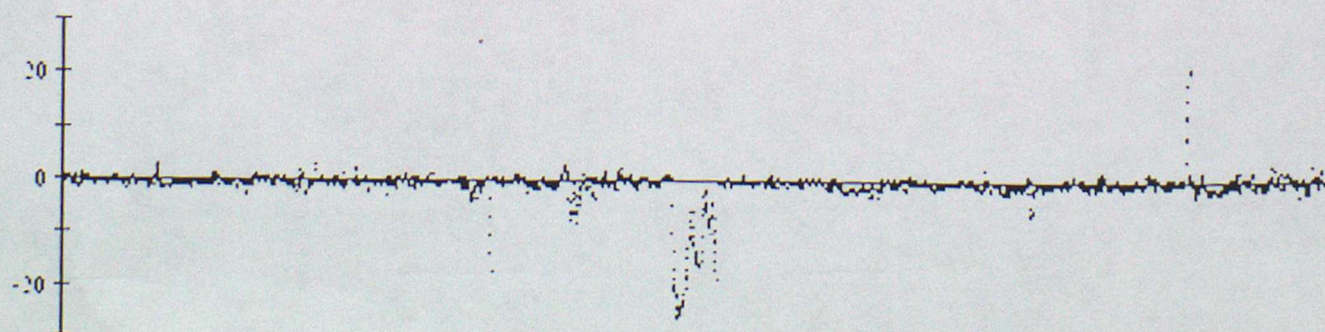
44623 Pressure



44624 Pressure

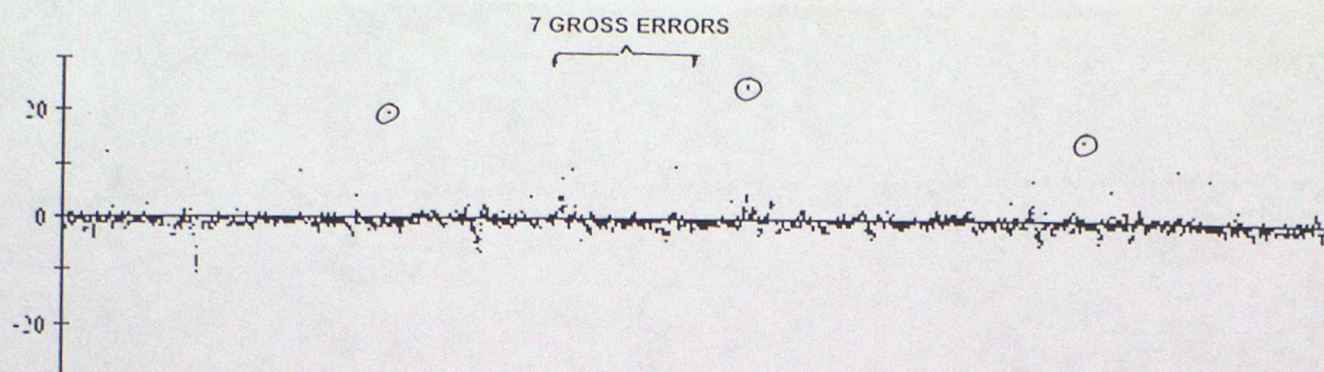


44625 Pressure

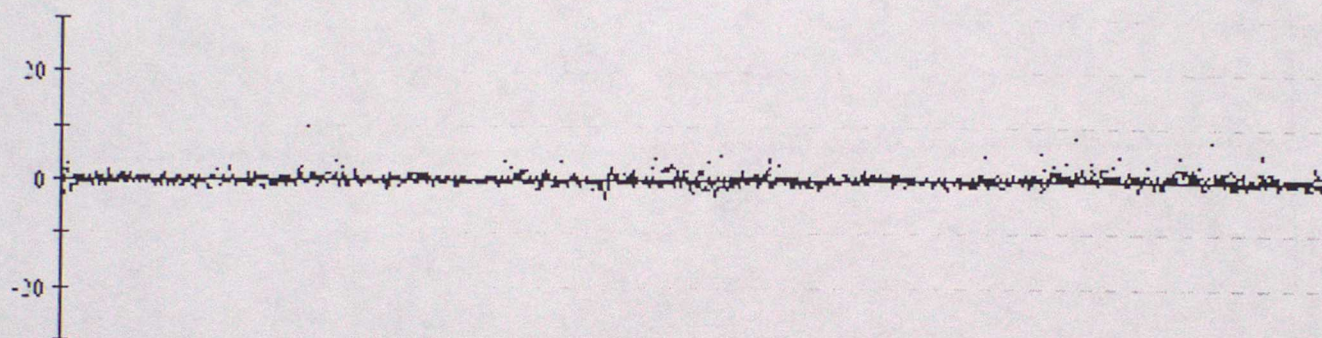


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

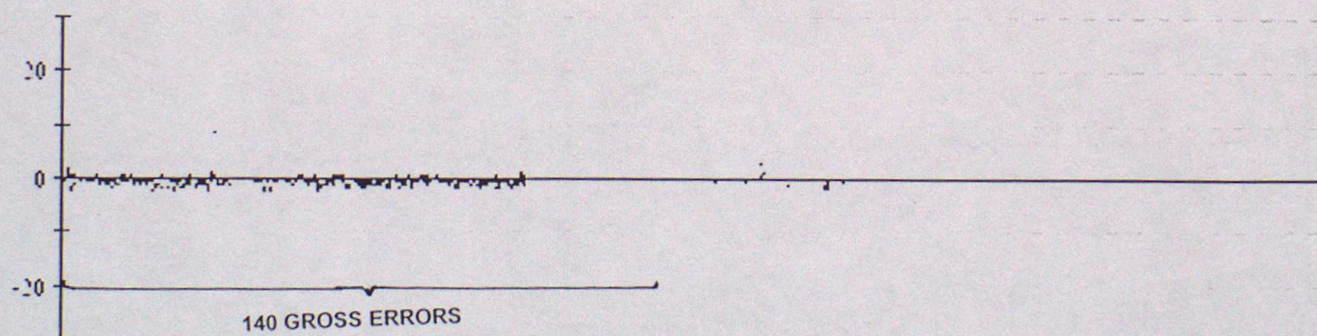
44627 Pressure



44721 Pressure



44722 Pressure

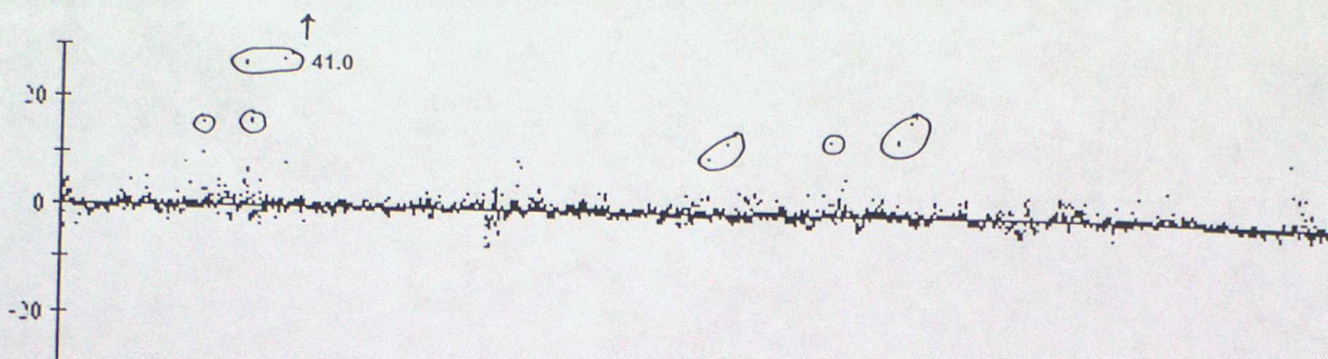


44723 Pressure

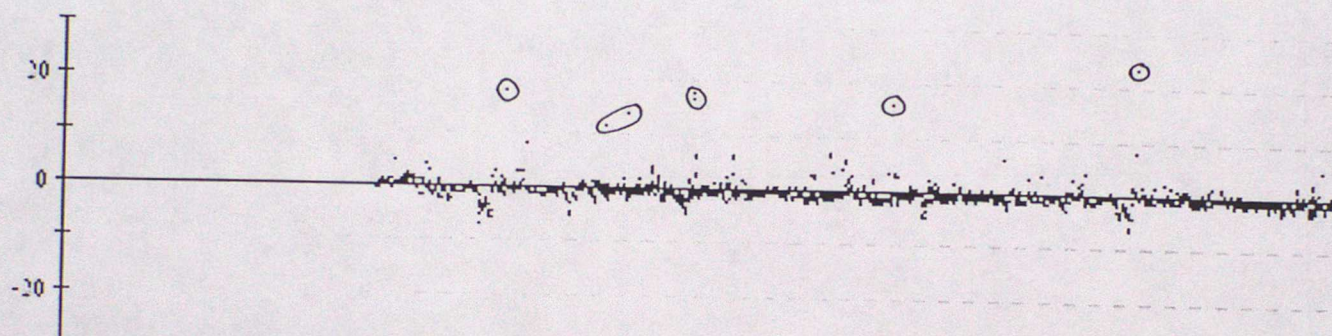


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

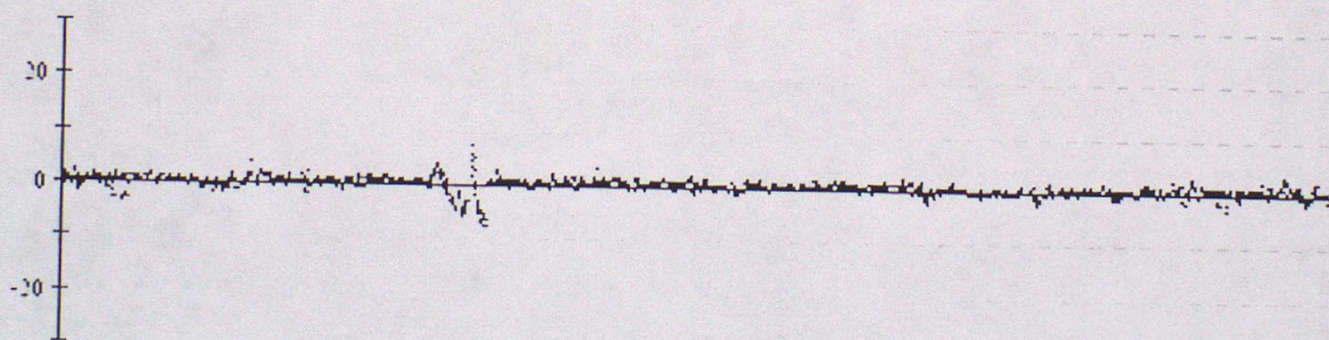
44726 Pressure



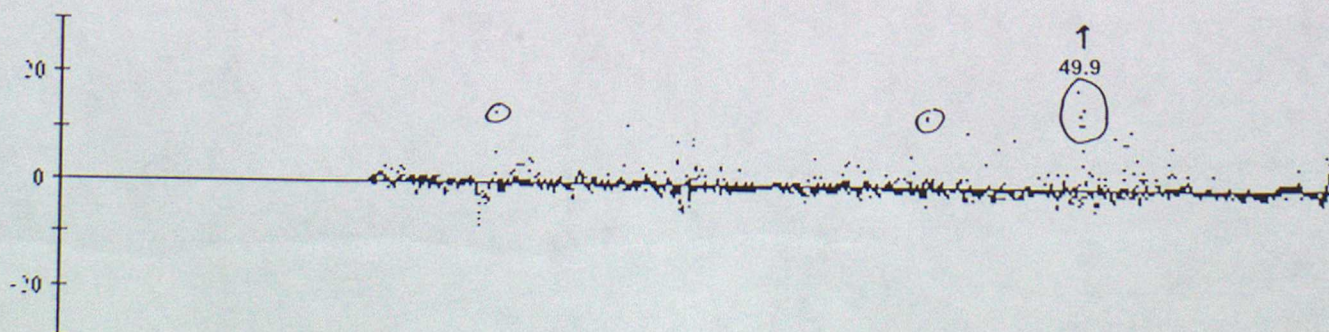
44728 Pressure



44729 Pressure

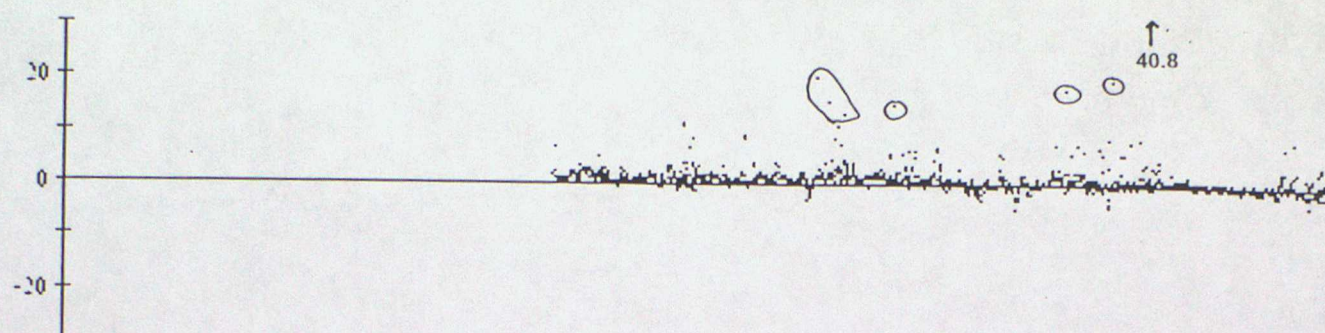


44730 Pressure

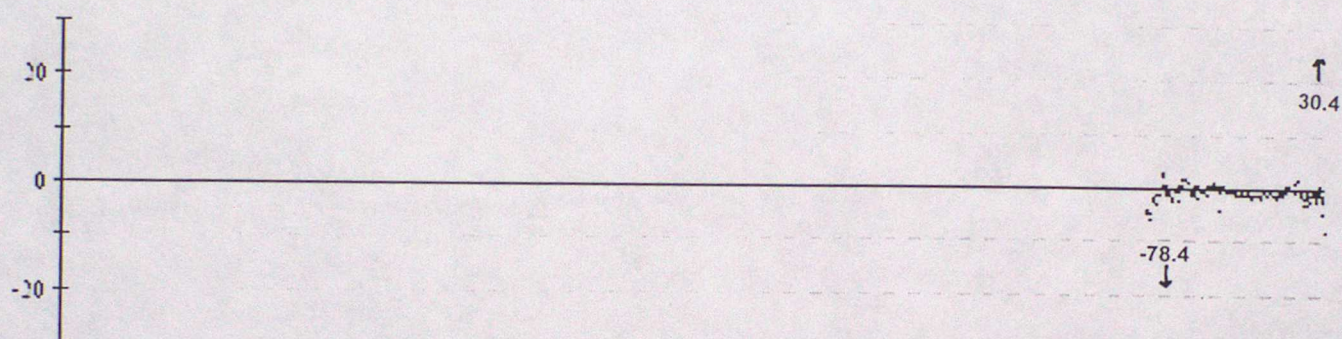


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

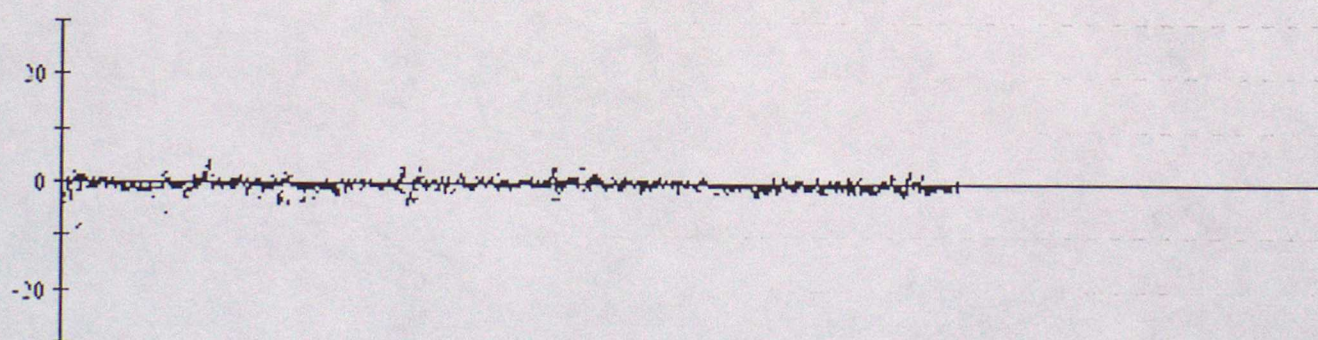
44742 Pressure



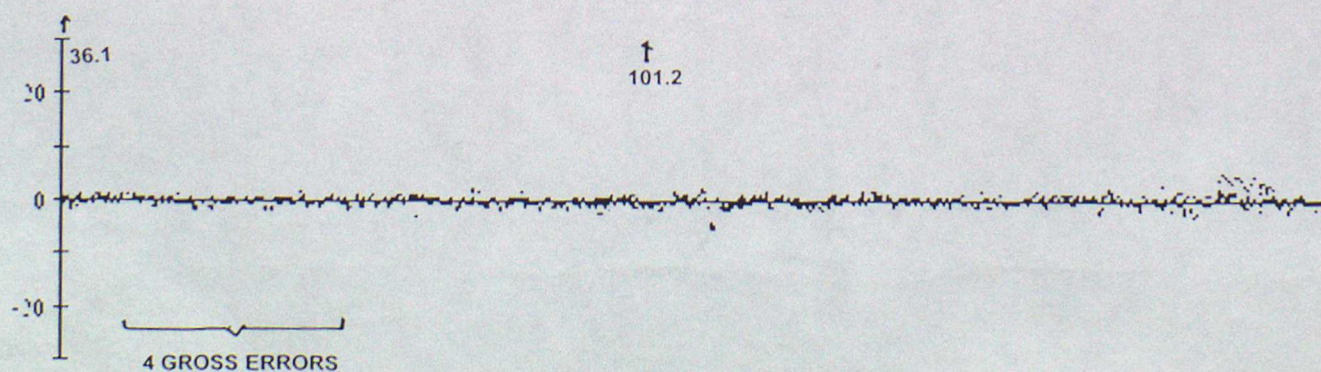
44743 Pressure



44761 Pressure

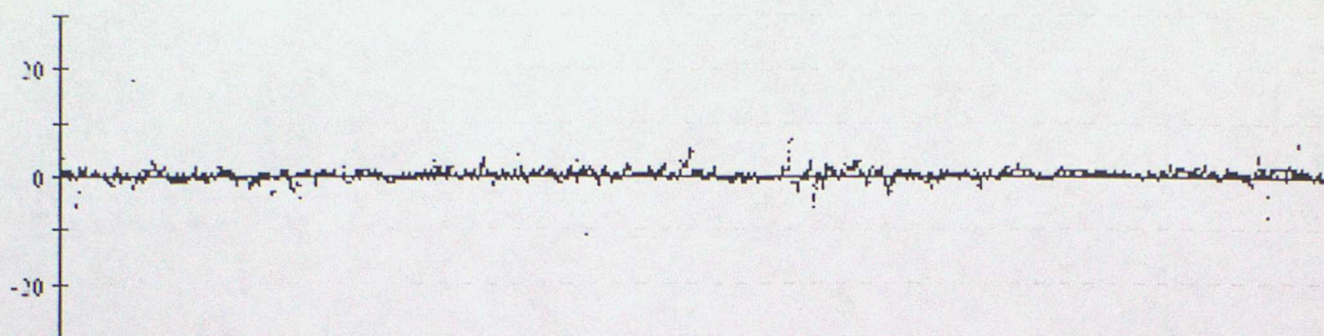


44765 Pressure

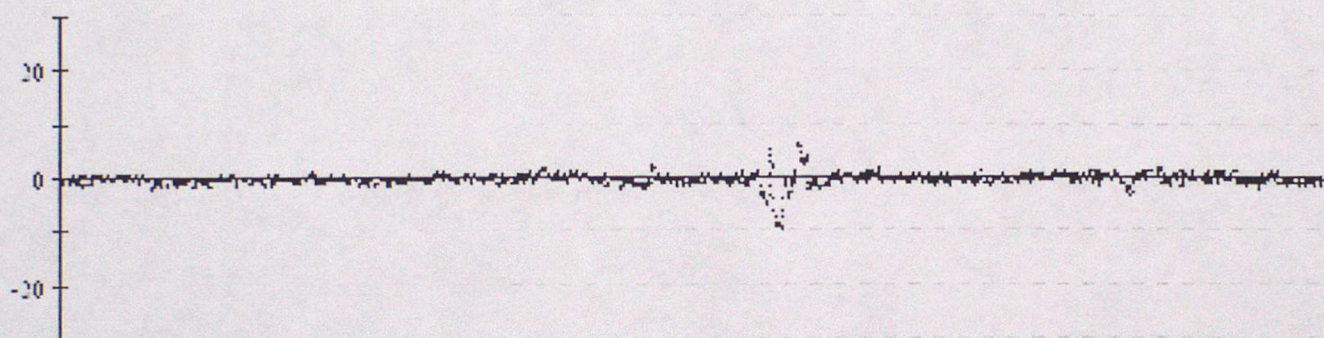


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

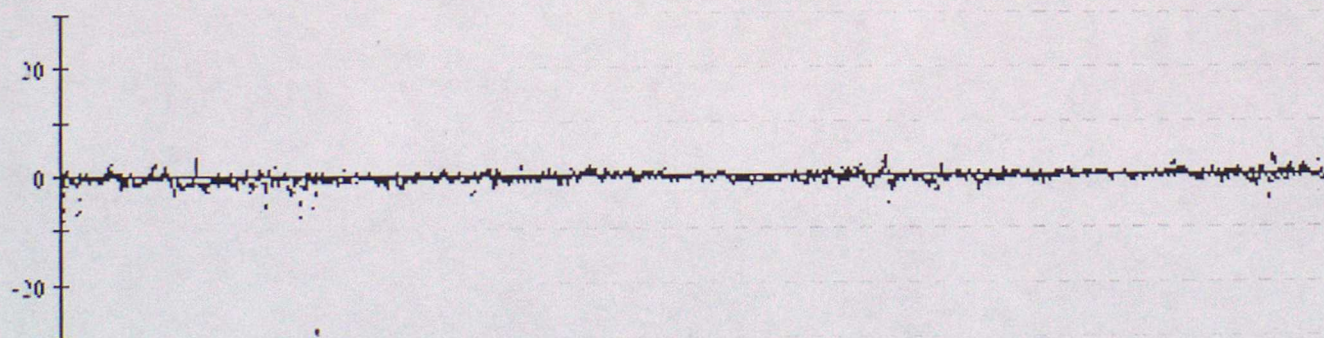
44771 Pressure



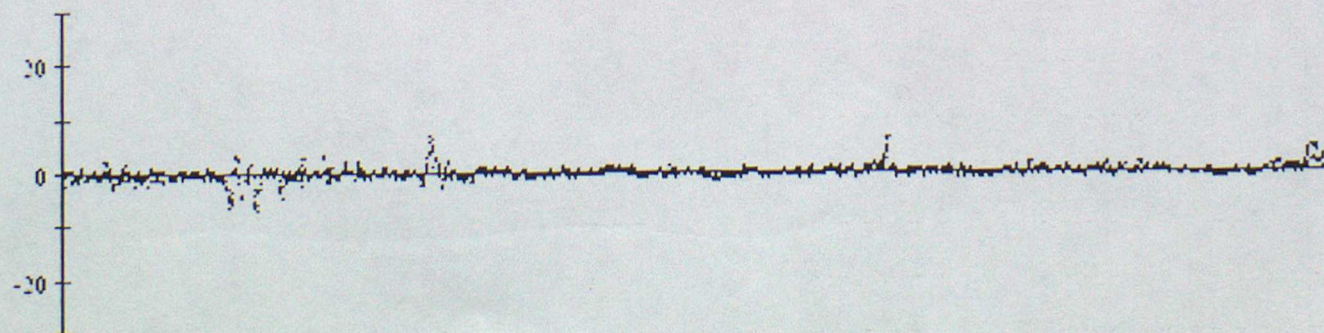
44775 Pressure



44776 Pressure

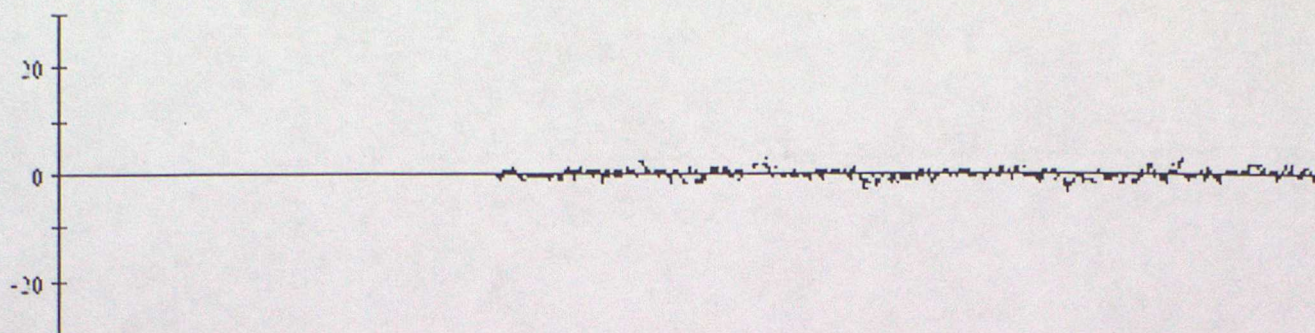


44778 Pressure

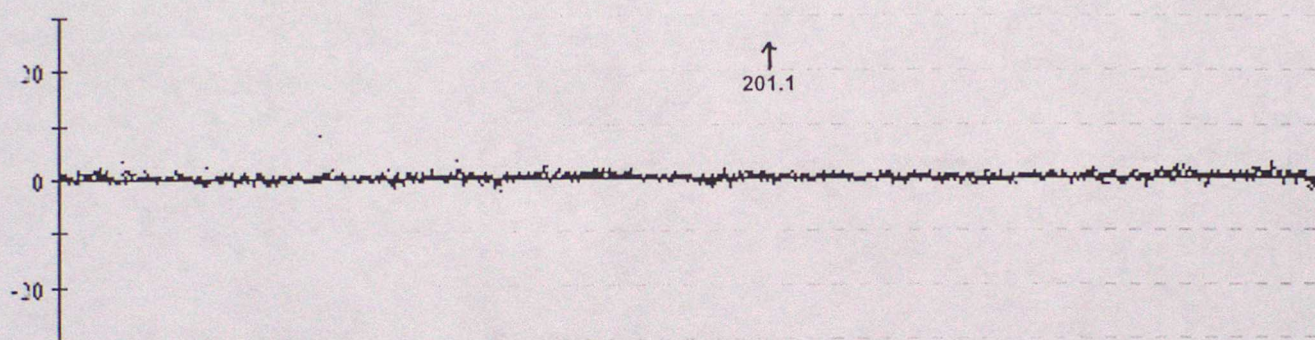


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

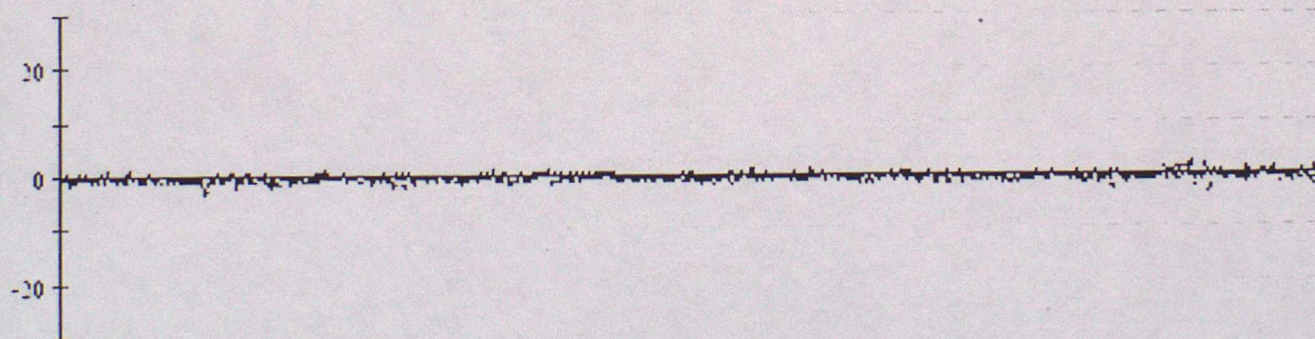
47556 Pressure



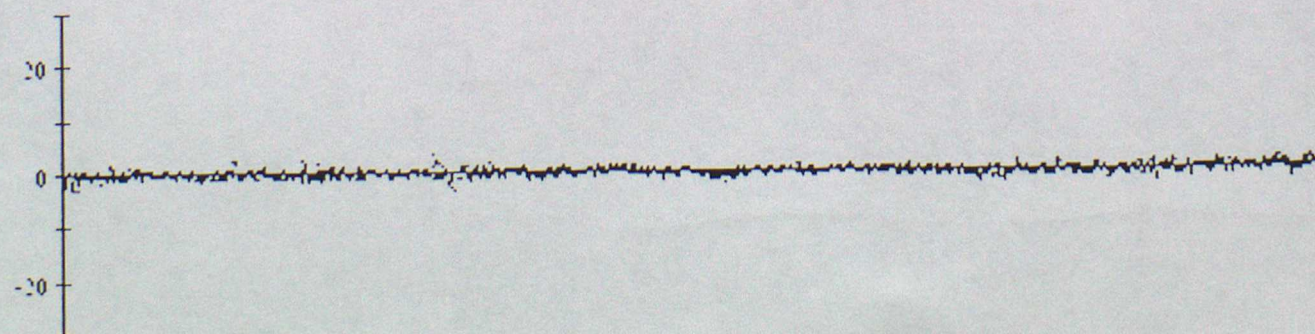
62501 Pressure



62503 Pressure

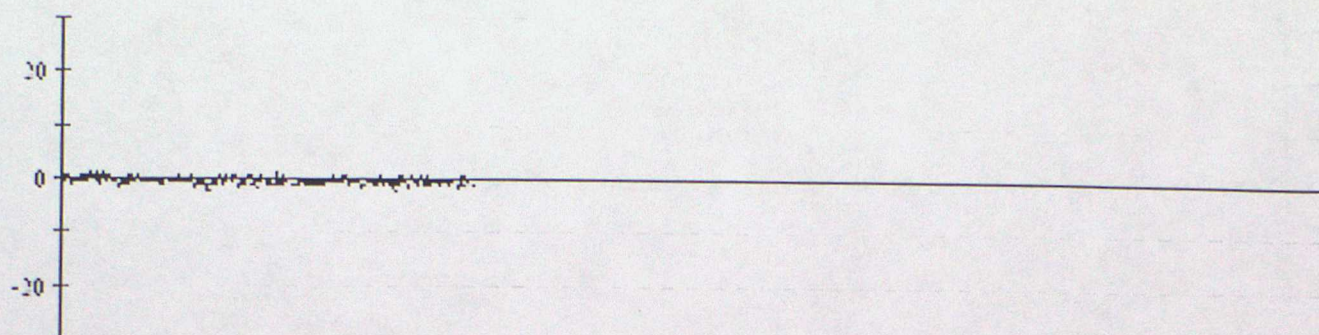


62504 Pressure

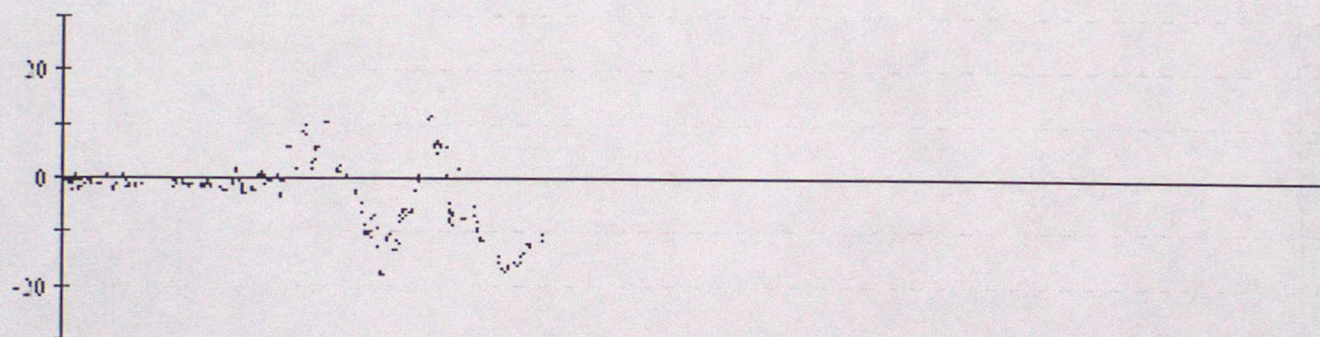


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

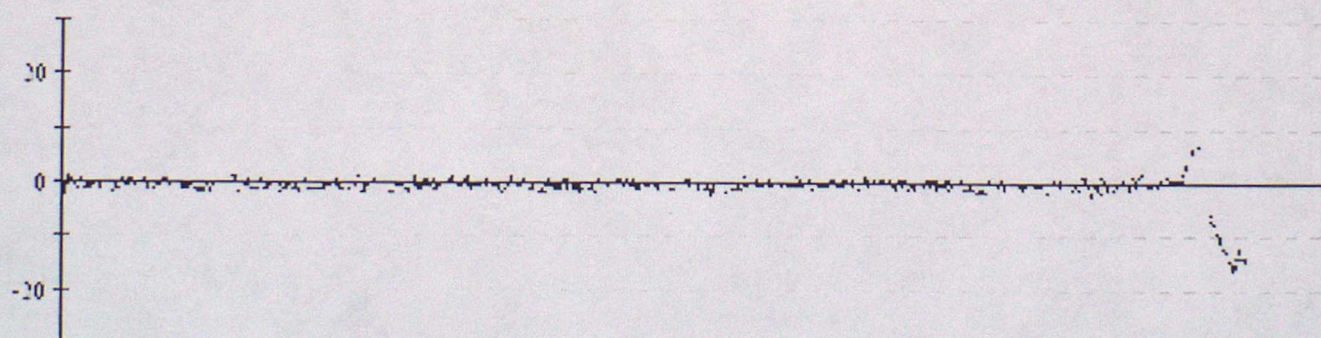
62505 Pressure



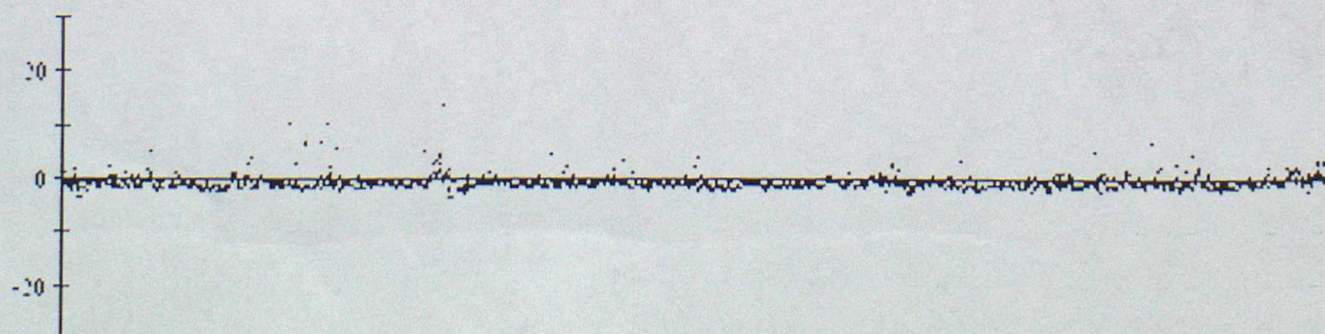
62510 Pressure



62511 Pressure

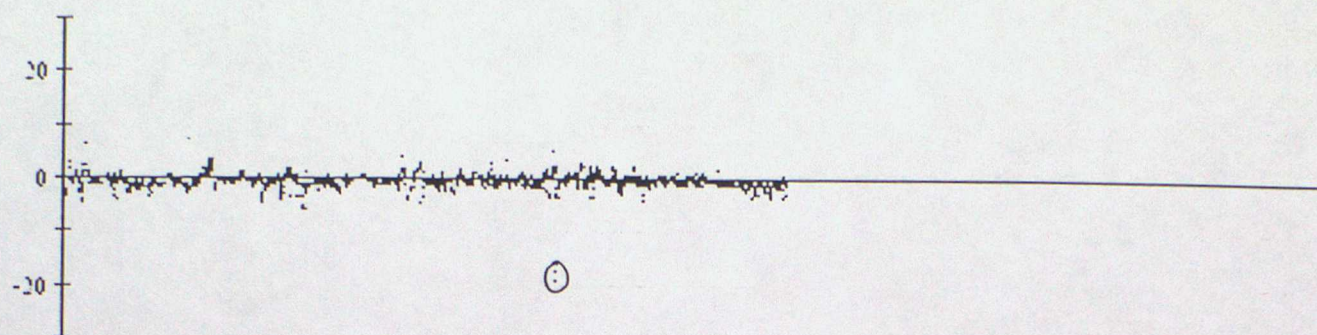


62512 Pressure

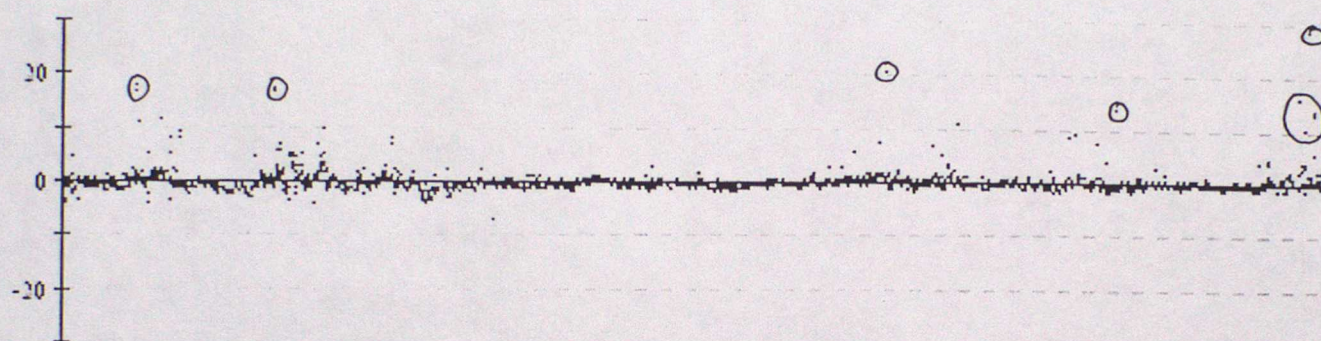


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

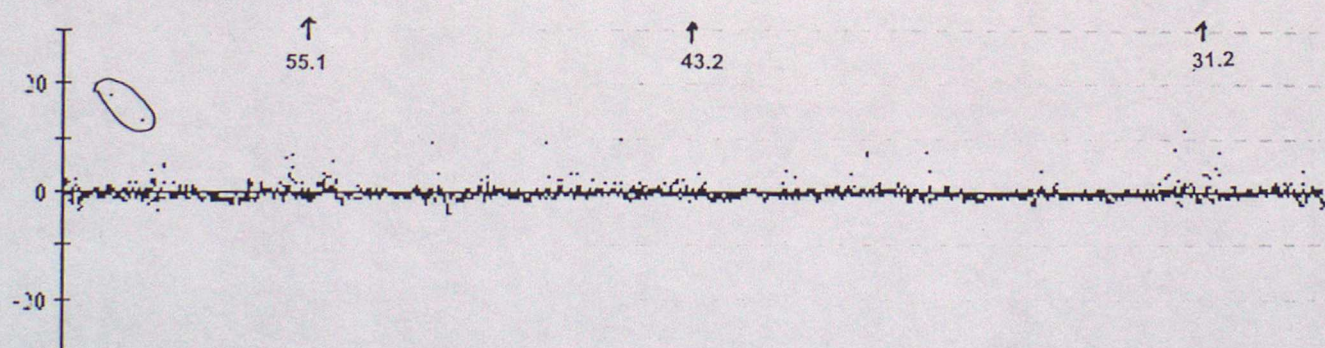
62514 Pressure



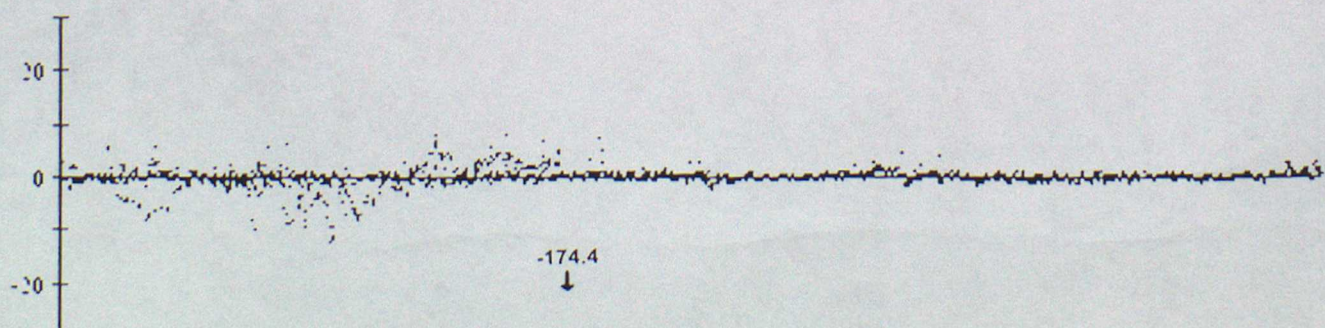
62516 Pressure



62518 Pressure

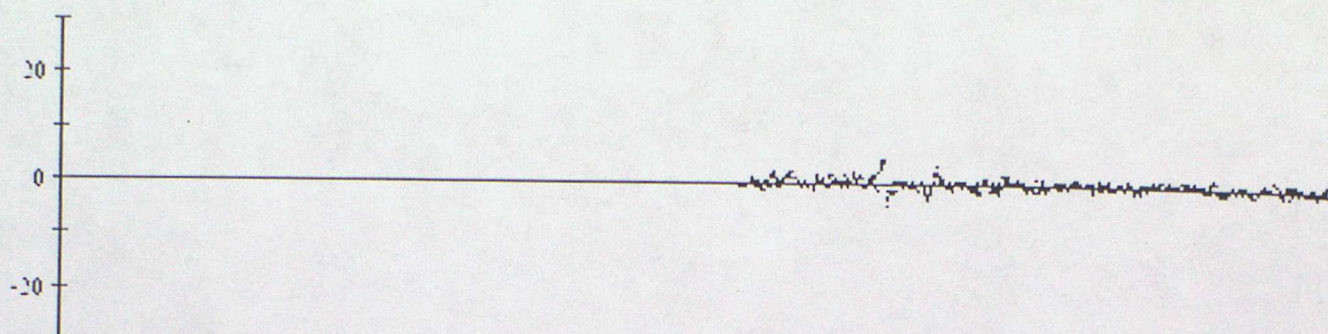


62519 Pressure

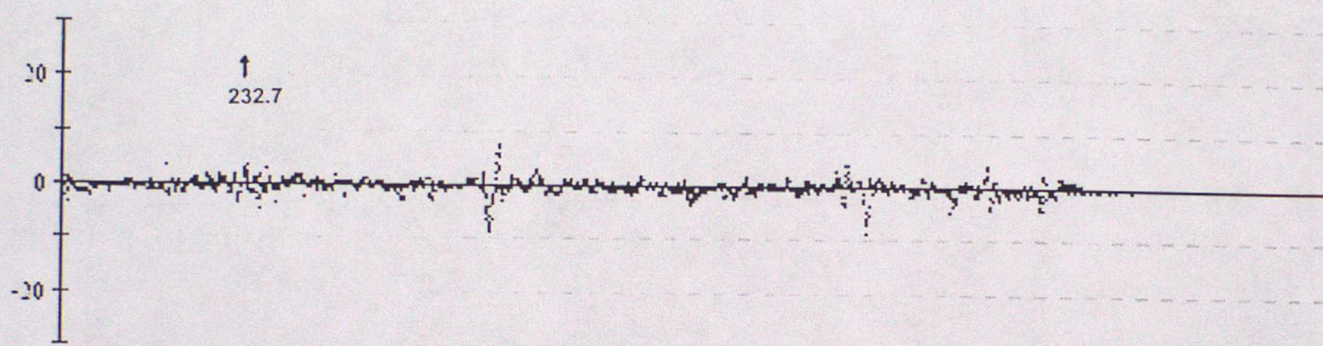


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

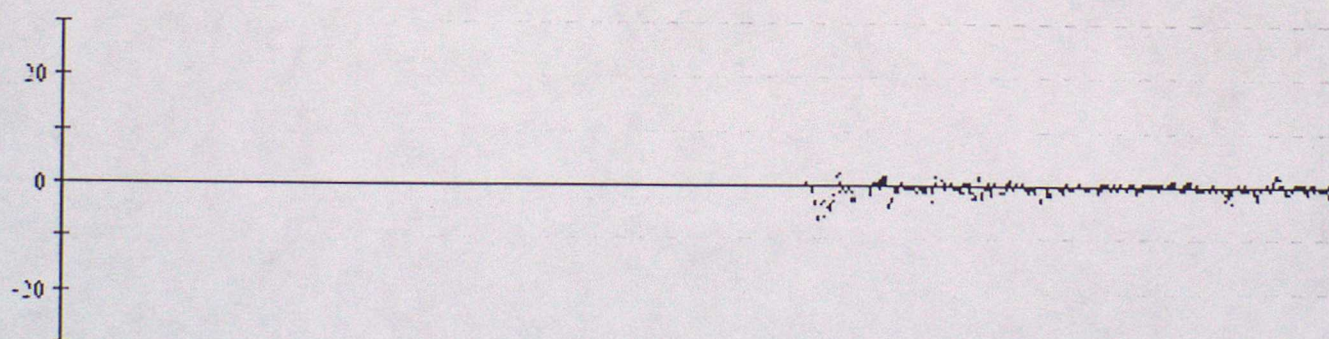
62520 Pressure



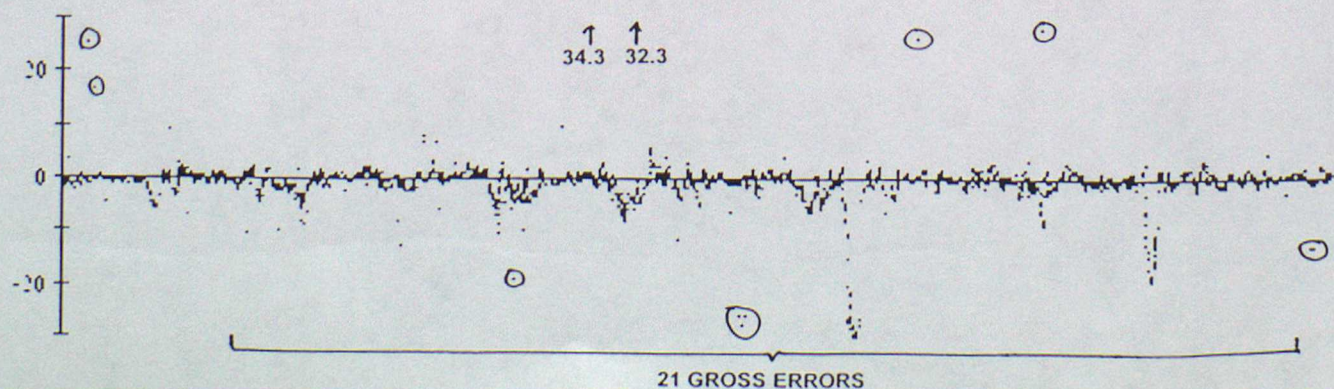
62596 Pressure



62598 Pressure

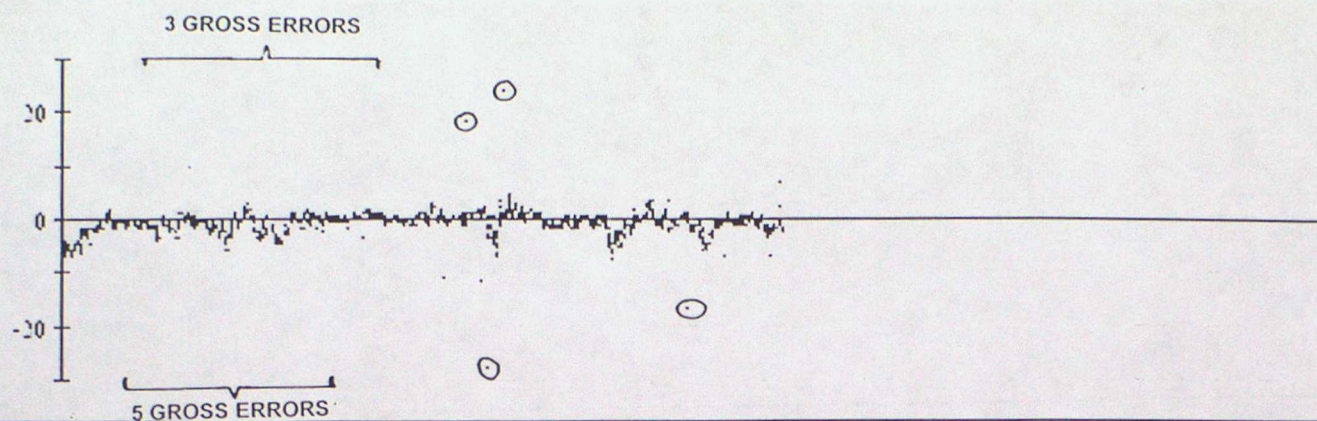


64549 Pressure

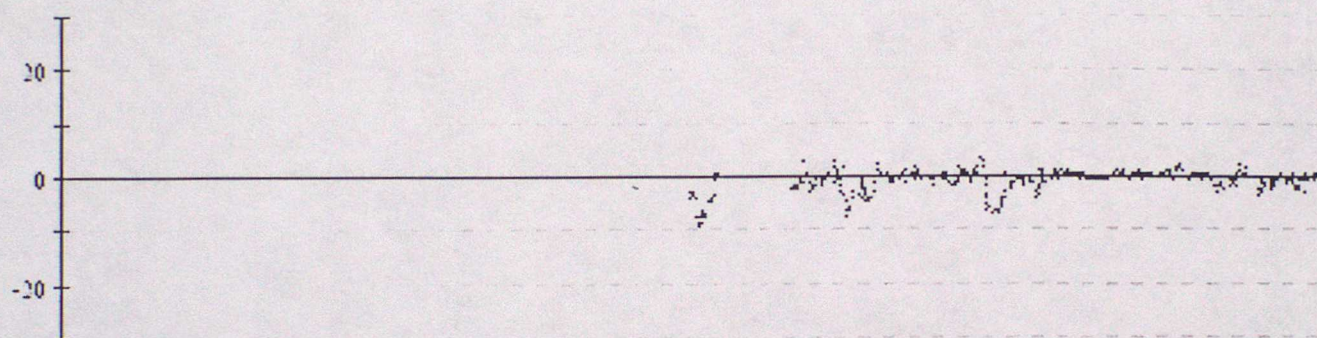


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

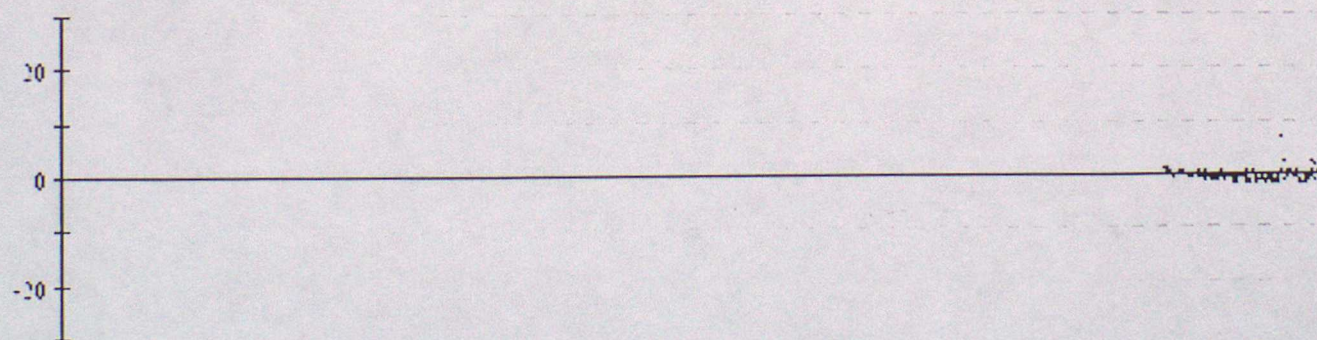
64550 Pressure



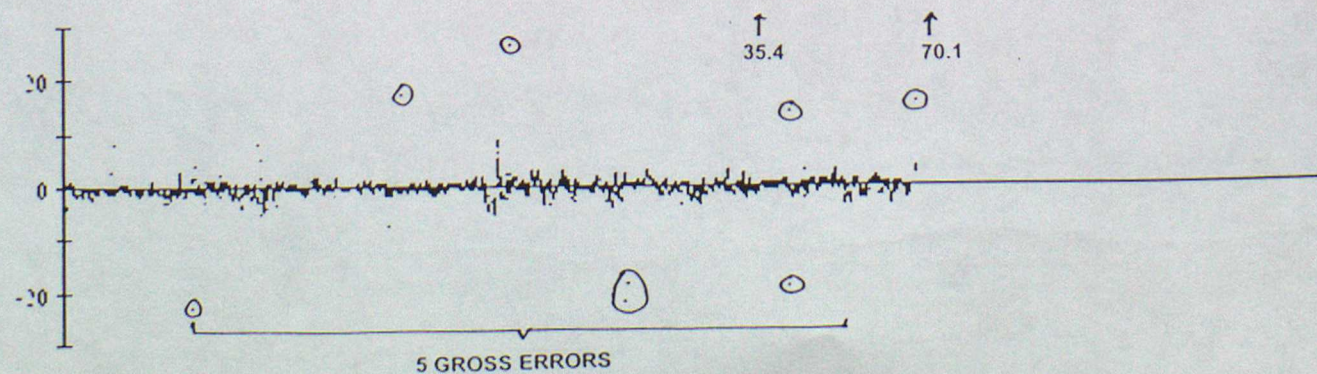
64551 Pressure



64552 Pressure

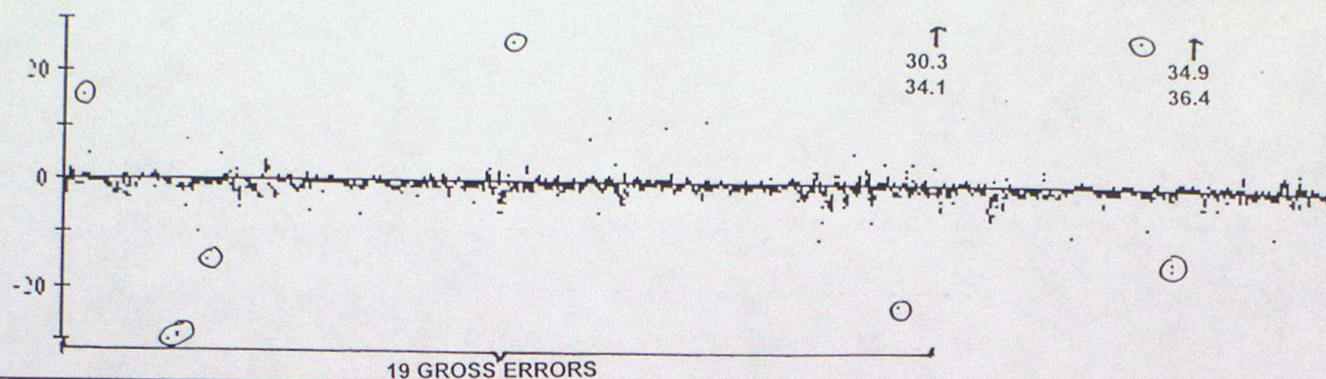


65516 Pressure

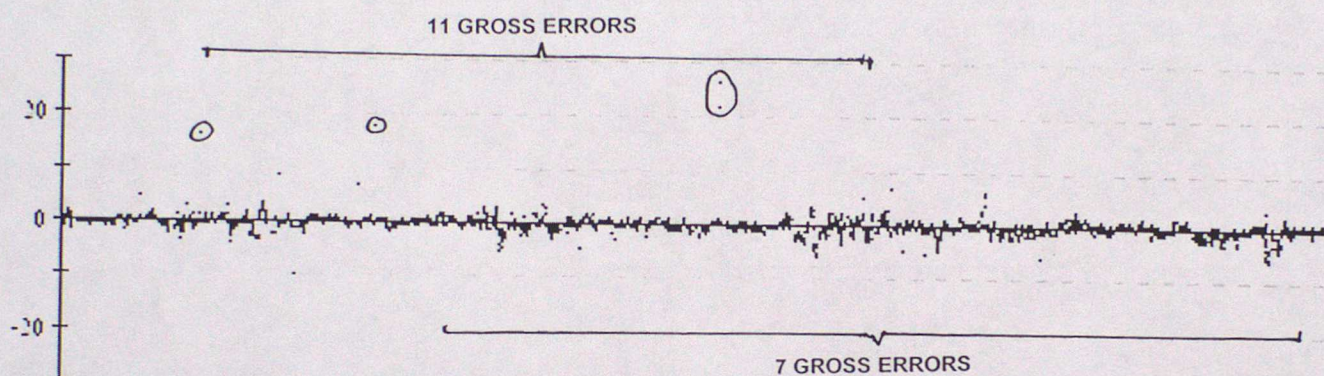


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

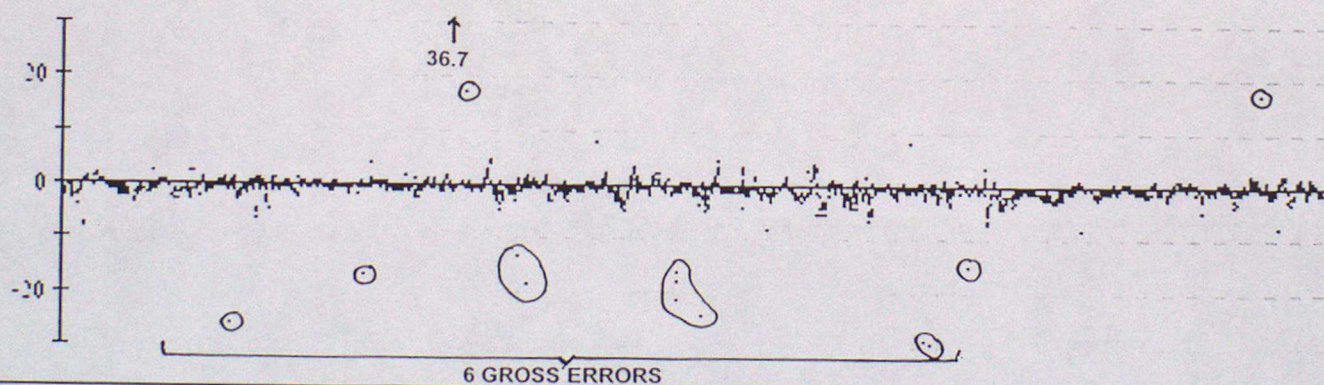
65581 Pressure



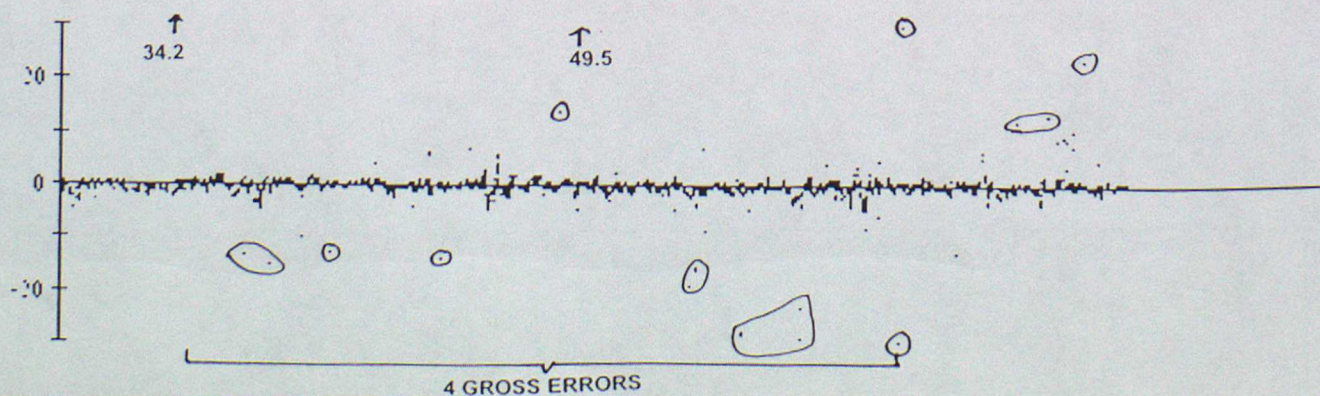
65595 Pressure



65602 Pressure



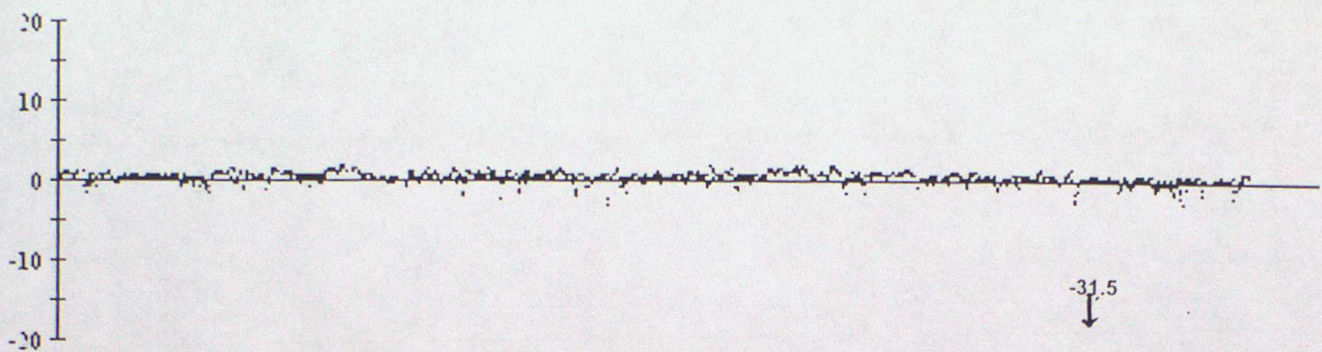
65662 Pressure



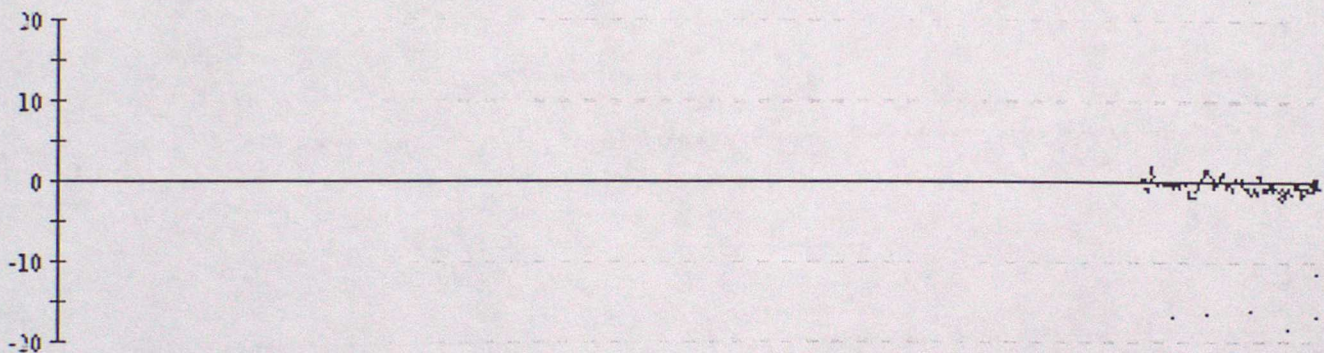
ANNEX C - TIME SERIES PLOTS OF AIR TEMPERATURE

Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

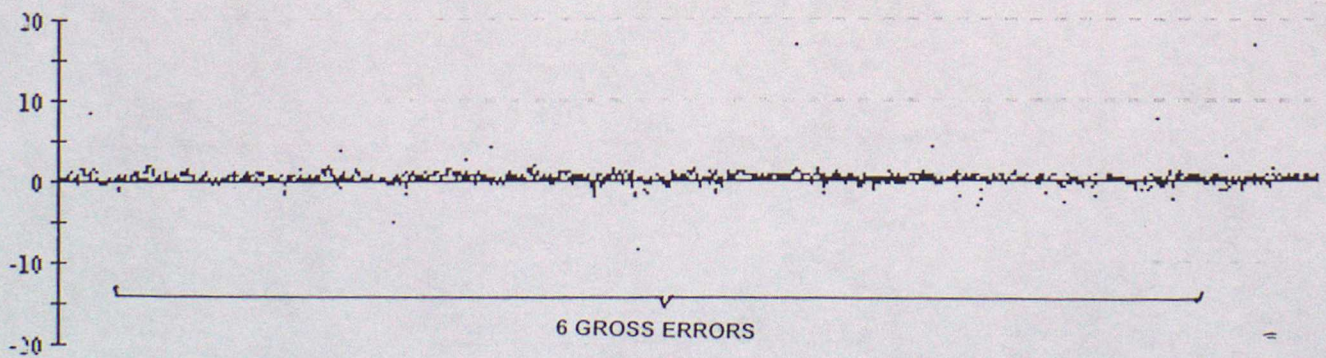
44613 Air Temperature



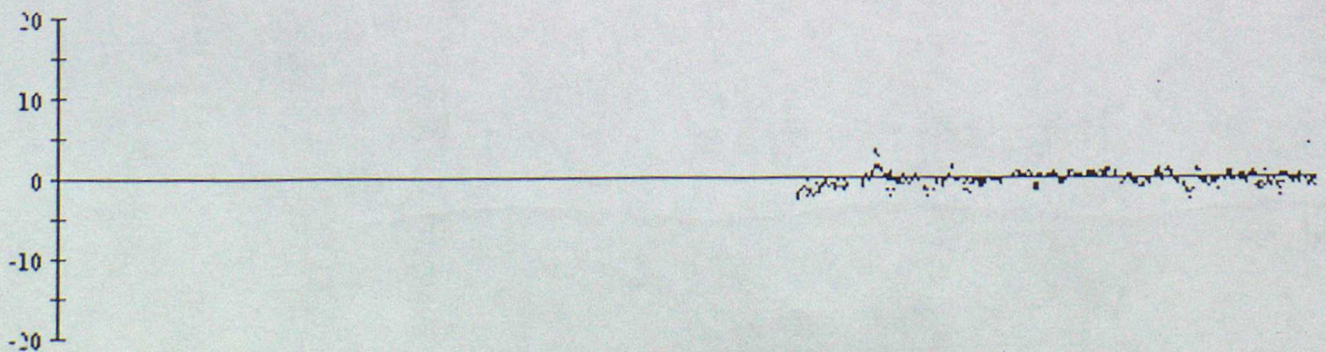
44743 Air Temperature



44765 Air Temperature

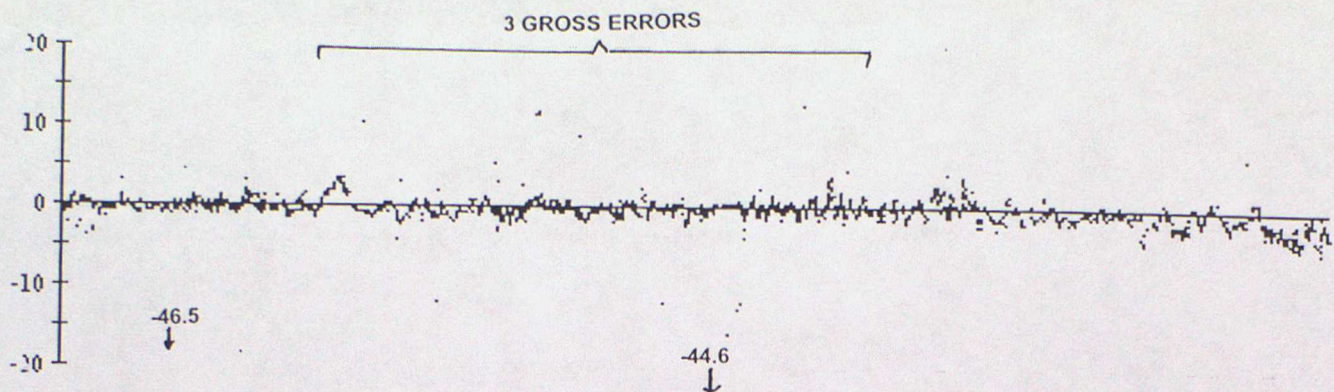


62598 Air Temperature

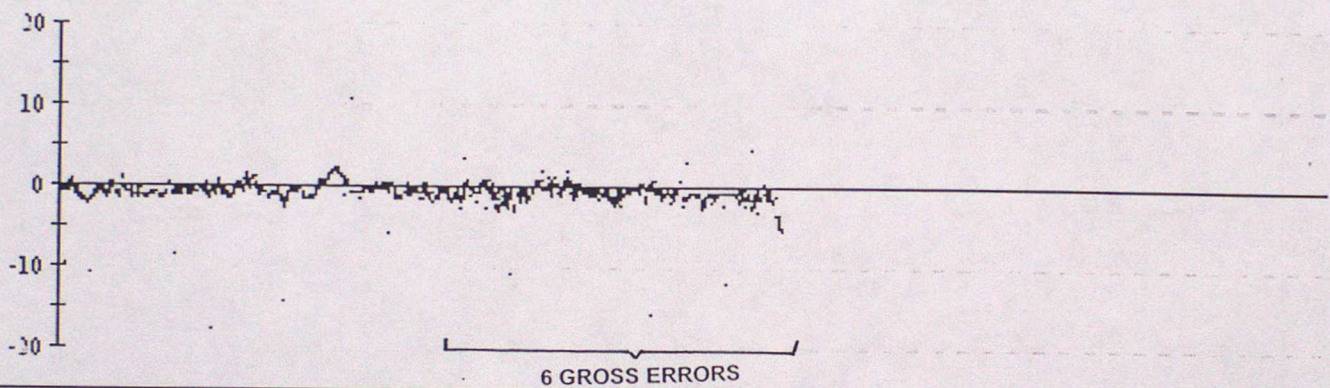


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

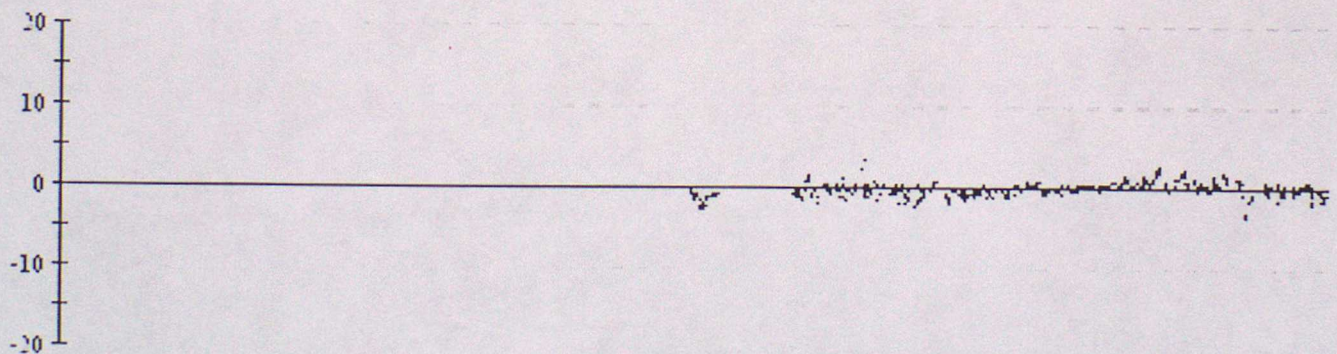
64549 Air Temperature



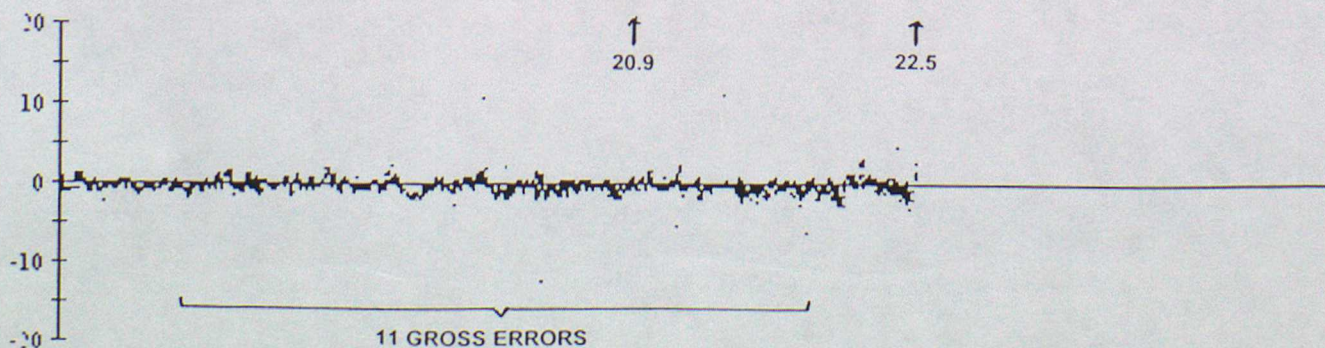
64550 Air Temperature



64551 Air Temperature

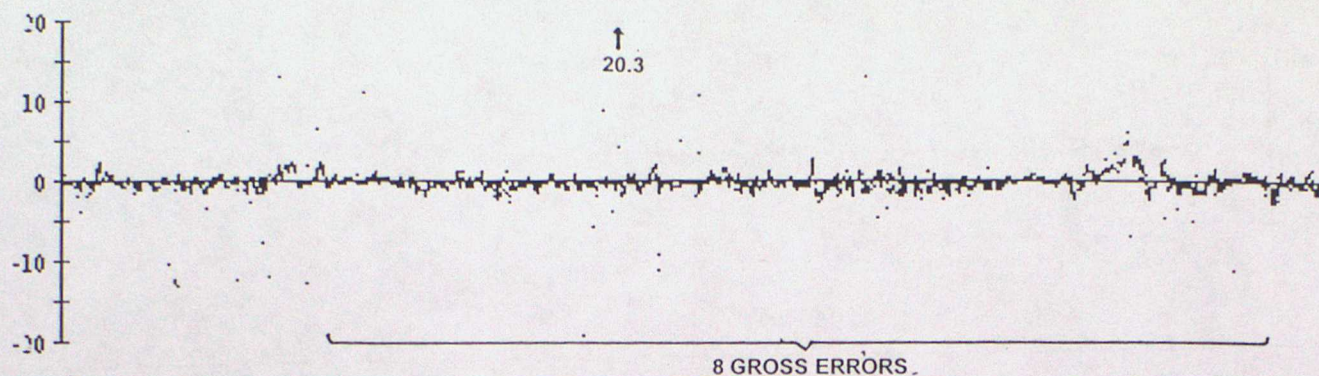


65516 Air Temperature

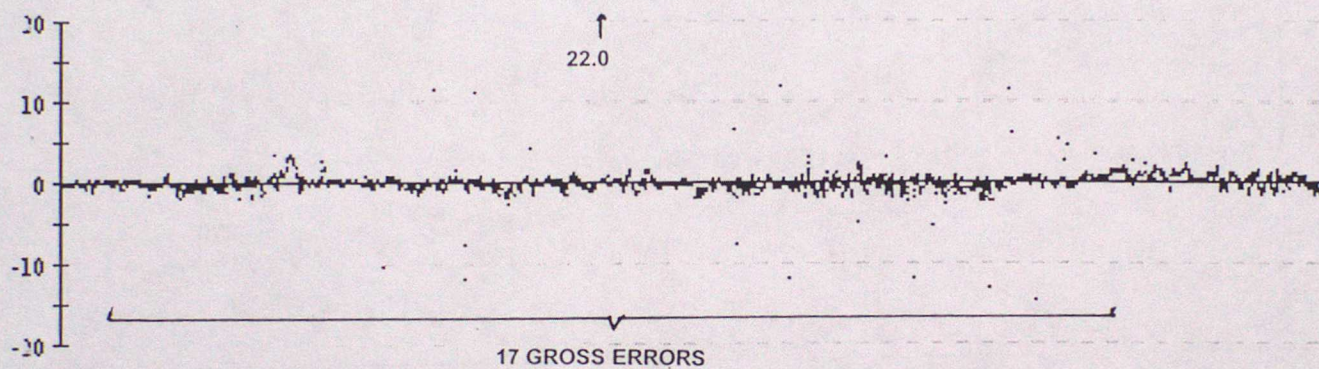


Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

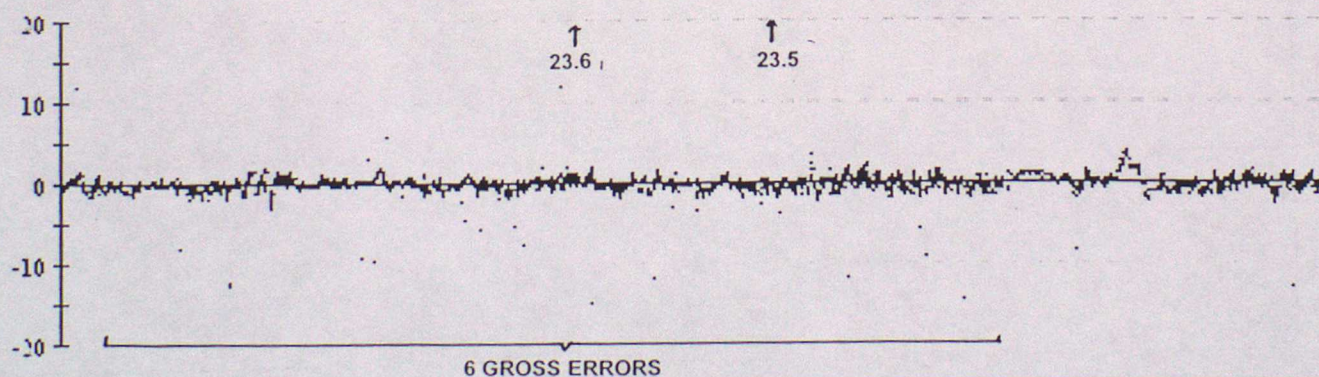
65581 Air Temperature



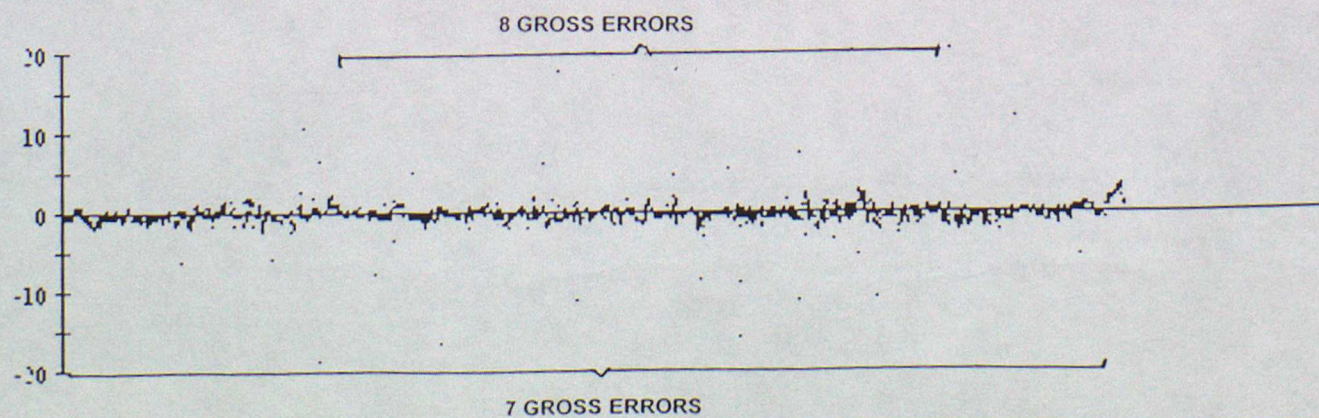
65595 Air Temperature



65602 Air Temperature



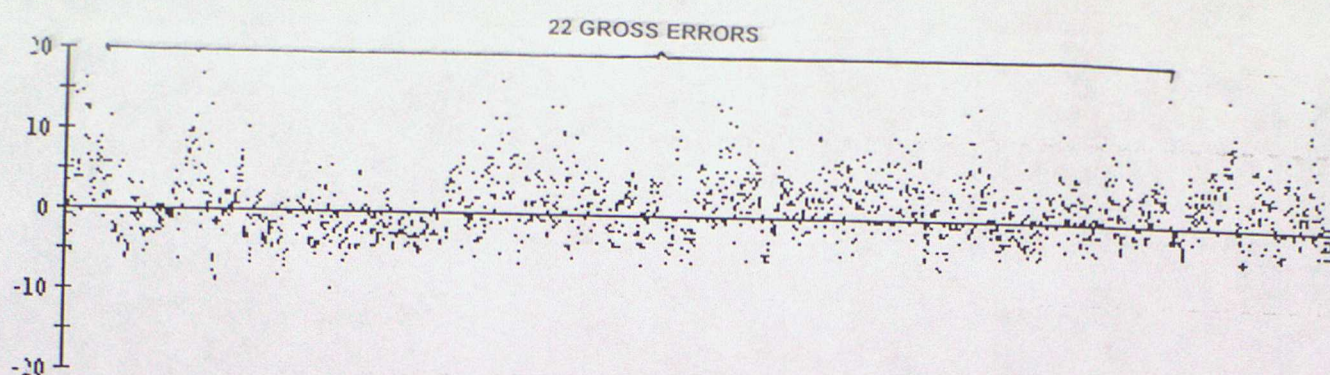
65662 Air Temperature



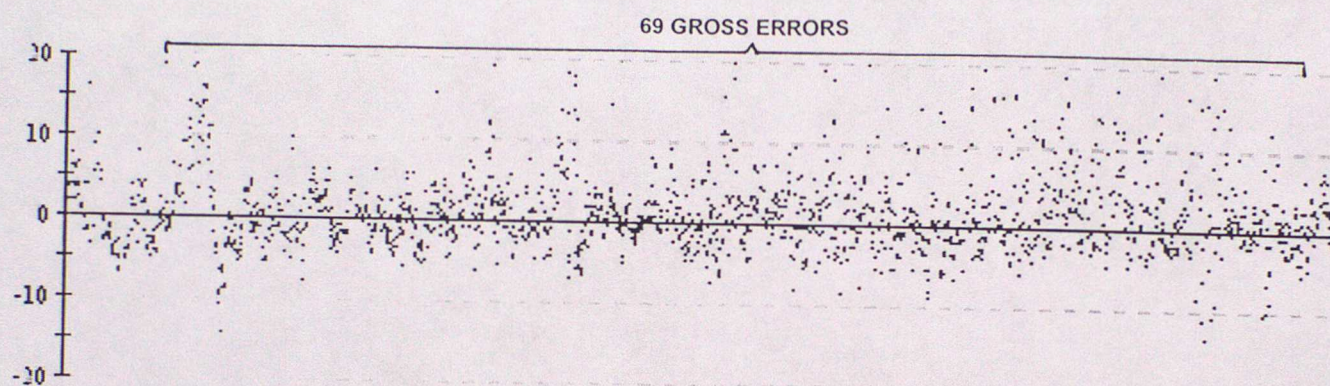
ANNEX D - TIME SERIES PLOTS OF WIND SPEED

Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

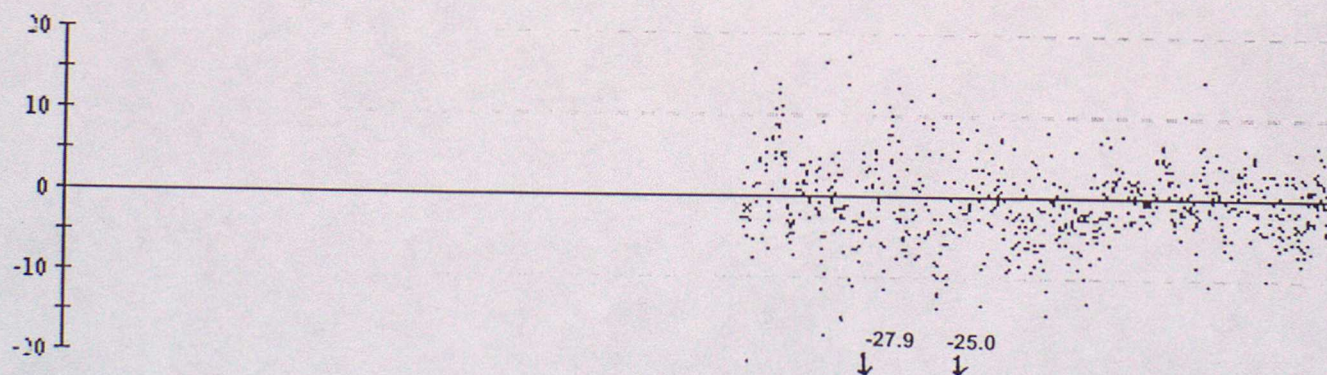
41647 Wind speed



41652 Wind speed



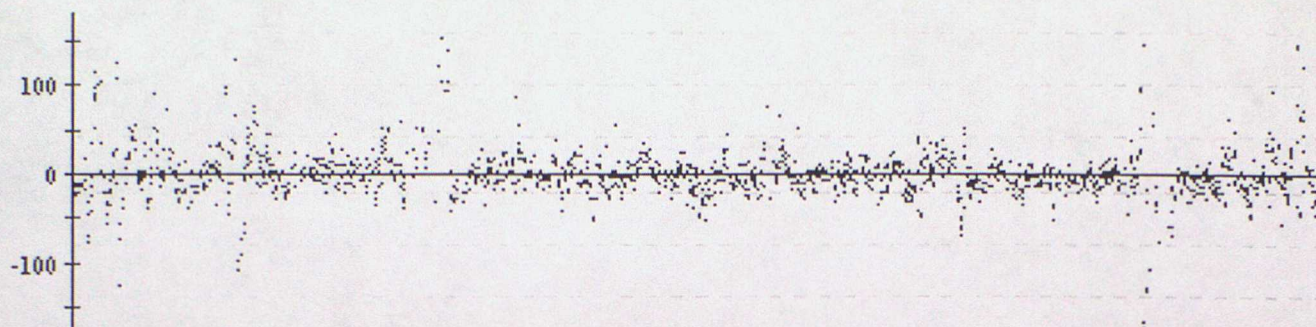
62520 Wind speed



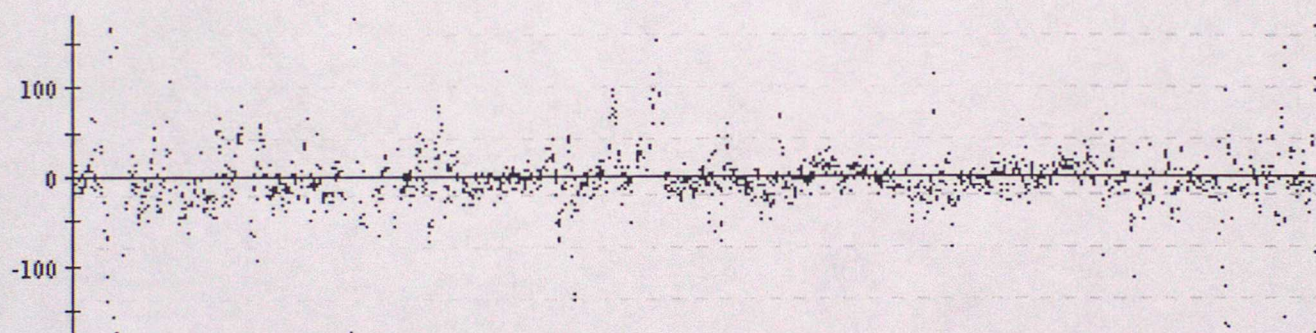
ANNEX E - TIME SERIES PLOTS OF WIND DIRECTION

Data from 00z on 01/10/2001 to 23z on 31/12/2001 (OBS - Background field)

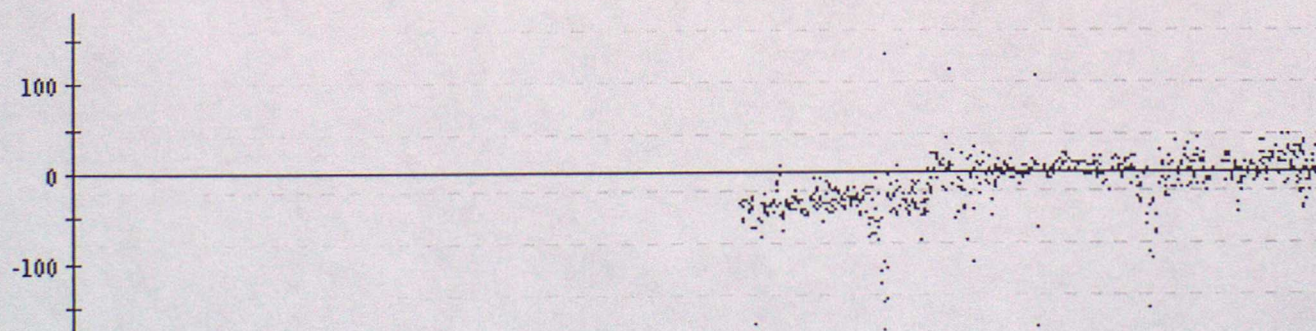
41647 Wind direction



41652 Wind direction



62520 Wind direction



ANNEX F - CONT'd

[illegible]

ANNEX F - SUMMARY TABLE OF OPERATIONAL DRIFTING BUOYS

WMO No.	Argos No.	Owner	Elements Reported						Reporting Period
			PP	Pt	TT	FF	DD	SST	
41505	26968	US	*					*	01/10 - 08/10
41523	28840	US	*					*	01/10 - 31/12
41639	28853	US	*					*	01/10 - 05/12
41642	28849	US	*					*	01/10 - 20/12
41644	28853	US	*					*	01/10 - 11/10
41647	7743	US	*	*		*	*	*	01/10 - 31/12
41652	7897	US	*	*		*	*	*	01/10 - 31/12
41658	16635	US	*	*				*	03/11 - 31/12
41659	16636	US	*	*				*	03/11 - 31/12
44546	25374	UK	*	*				*	01/10 - 31/12
44548	27617	UK	*	*				*	01/10 - 31/12
44549	22648	UK	*	*				*	01/10 - 31/12
44550	23703	UK	*	*				*	01/10 - 31/12
44612	27619	UK	*	*				*	01/10 - 31/12
44613	28467	UK	*	*	*				01/10 - 26/12
44616	17149	UK	*	*				*	01/10 - 31/12
44621	17150	UK	*	*				*	01/10 - 31/12
44623	27624	UK	*	*				*	01/10 - 31/12
44624	17151	UK	*	*				*	01/10 - 31/12
44625	17153	UK	*	*				*	01/10 - 31/12
44627	13698	NL	*	*				*	01/10 - 31/12
44721	18702	UK	*	*				*	01/10 - 31/12
44722	18706	UK	*	*					01/10 - 08/12
44723	21562	UK	*	*				*	01/10 - 31/12
44726	23460	UK	*	*				*	01/10 - 31/12
44728	23553	UK	*	*				*	23/10 - 31/12
44729	25375	UK	*	*				*	01/10 - 31/12
44730	23856	UK	*	*				*	23/10 - 31/12
44742	21667	UK	*	*				*	05/11 - 31/12
44743	4270	D	*	*	*			*	19/12 - 31/12
44761	27615	UK	*	*				*	01/10 - 05/12
44765	28466	UK	*	*	*				01/10 - 31/12
44771	25377	UK	*	*				*	01/10 - 31/12
44775	25372	UK	*	*				*	01/10 - 31/12
44776	25371	UK	*	*				*	01/10 - 31/12
44778	25370	UK	*	*				*	01/10 - 31/12

