

TWO SHIP

EXPERIMENT ON THE

RISE

AXIS

CHIEF SCIENTISTS

R/V THOMAS WASHINGTON

DR. ALISTAIR HARDING

DR. JOHN A. ORCUTT

R/V MAURICE EWING

ROBERT S. DETRICK

JOHN MUTTER

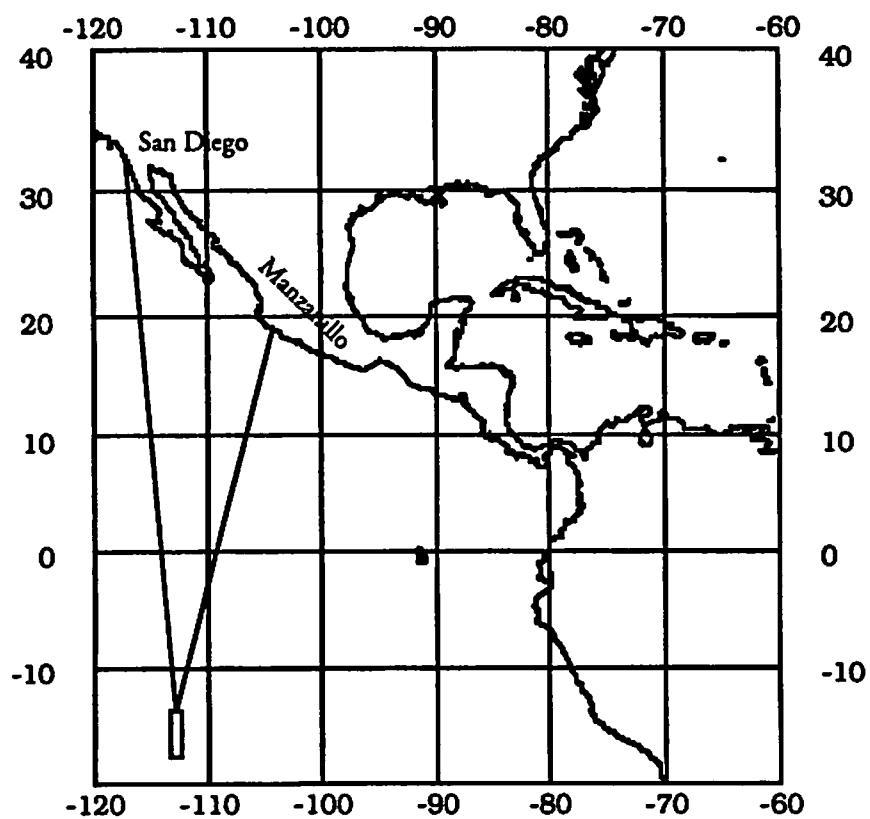
R/V THOMAS WASHINGTON

28 MARCH-2 MAY

1991

**PERRY CRAMPTON
ALISTAIR HARDING
PAUL HENKART
CRISPIN HOLLINSHEAD
GRAHAM KENT
SETH MOGK
EVAN NEWELL**

**JOHN ORCUTT
LILIYA POSIOLOVA
DONALD SHECKLER
MARIA TOLSTOY
DAVID WILLOUGHBY
PAUL ZIMMER**



TERA Experiment Site
Southern East Pacific Rise
28 March–2 May 1991

ITERRA

March

April

May

28|29|30|31|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21|22|23|24|25|26|27|28|29|30|1|2|3|

Transit to Site 1

Exchange equipment w/Ewing
Deploy OBSs & airguns

Area 1 ESPs

Recover OBSs
Transit to Site 2
Area 2 ESPs
Transit to Area 3, Deploy OBSs

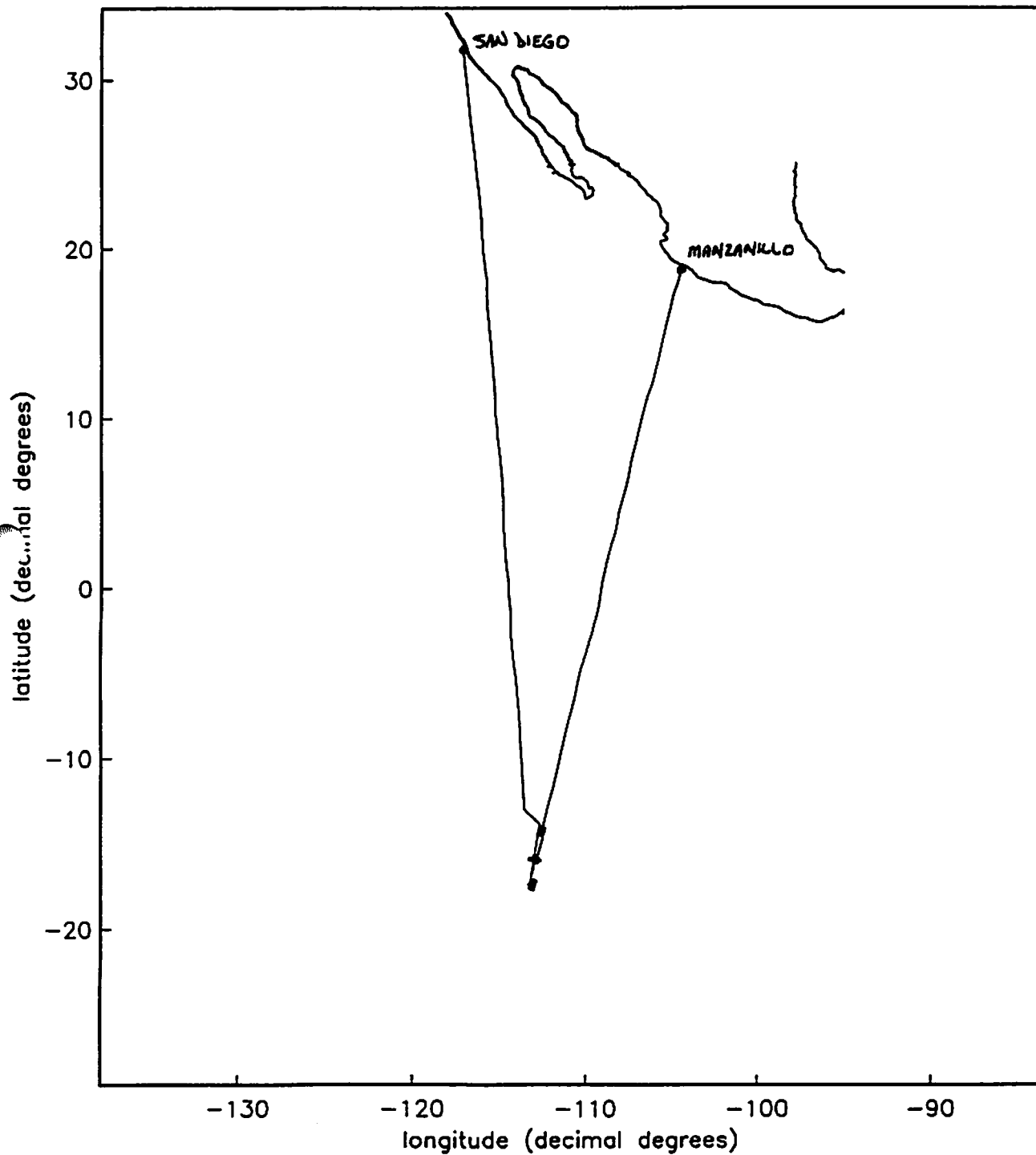
Area 3 ESPs

Recover OBSs, Transit to Area 2

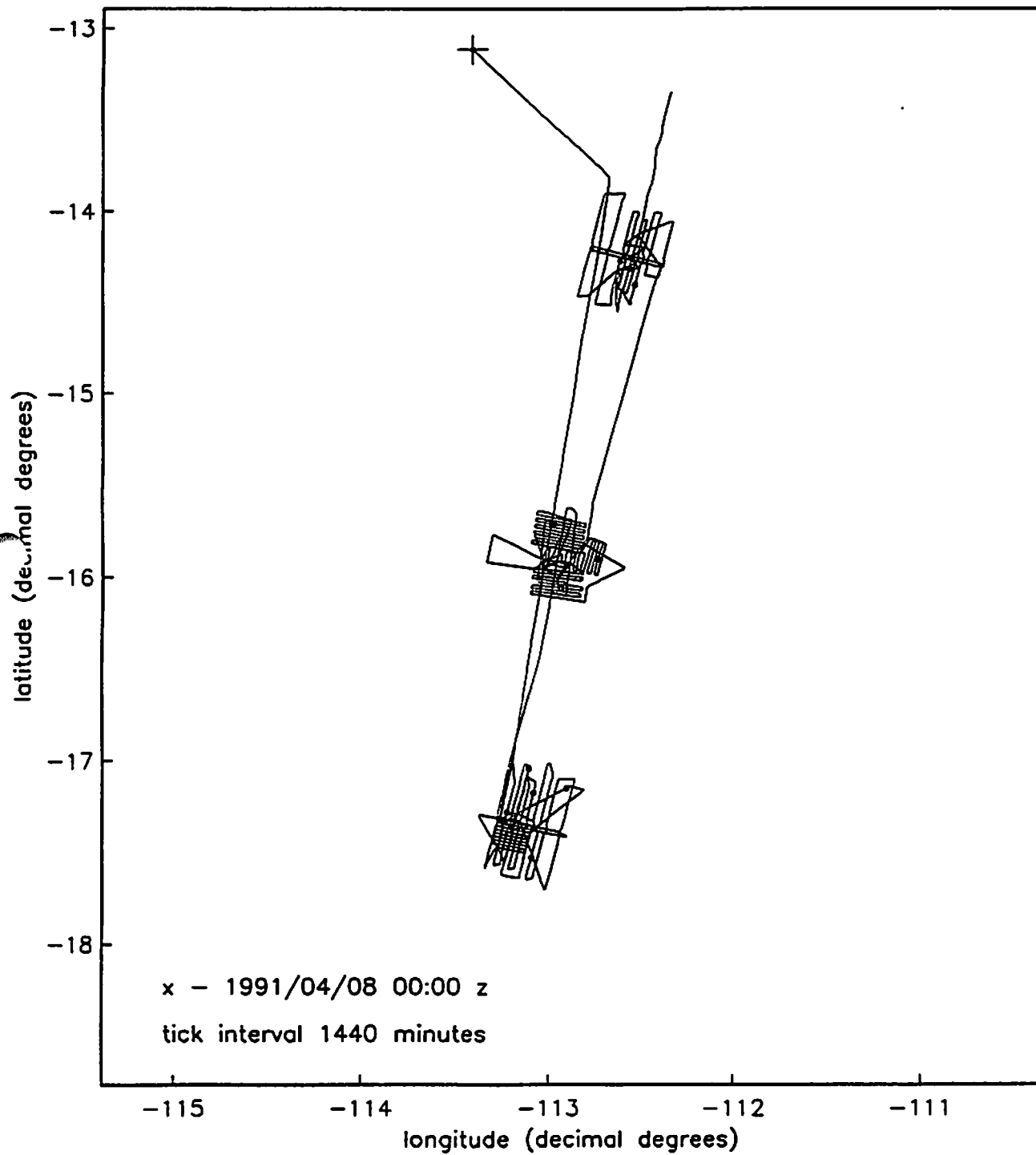
Deploy OBSs
Airguns for Tomography experiment
Recover OBSs

Transit to Manzanillo

1991/03/28 23:00 z to 1991/05/02 12:00 z



1991/04/08 00:00 z to 1991/04/24 20:00 z



First Weekly Report 15 April 1991

The purpose of this expedition, part of the NSF RIDGE program, is to use two-ship multichannel seismic and ocean bottom seismograph tomography techniques to develop a detailed picture of the internal structure of the fastest spreading portion of the mid-ocean ridge. Following our departure from San Diego on 28 March and an 11-day transit to the first experiment site at 17 degrees 20 min S, 113 degrees 7 min W, we met Lamont's R/V Ewing on 7 April. We transferred some equipment between the two ships including sonobuoys and airgun chambers and Orcutt, Harding, Kent and Tolstoy visited the Ewing to complete plans for the initial experiment. The OBSs were launched in 11 1/2 hours on 9 April and we shortly afterward began a series of "Expanding Spread Profiles" (ESP) averaging 40 km in total length parallel to the ridge crest. The R/V Washington is presently shooting an array of six airguns totaling 2390 cubic inches while the Ewing is towing an array of 20 guns with a capacity of 8000 cubic inches. In addition, the Ewing is towing a streamer 4.5 km long with about 120 active channels. Altogether fourteen ESPs were shot in this first experiment area. The tomography experiment has conservatively collected 81,000 OBS seismograms so far and the number will nearly triple before the experiment is over. The initial experiment site is a simple portion of the ridge with little along-axis variation in morphology. We have found a very bright magma chamber reflection on an elevated portion of this section of the ridge and the partially molten portion of the central low velocity zone appears to extend out as far as eight km. The OBSs were recovered on 14 April over a 13-hour period and we have moved north to the second experiment site at 15 degrees 55 min S, 112 degrees 57 min W, the site of a major Overlapping Spreading Center (OSC). We are presently extending the survey around this OSC using SeaBeam as we prepare to launch the OBSs again tomorrow for a second OBS tomography experiment. The SeaBeam system has been working very well during this leg and is providing excellent data on the off-ridge character of the seafloor in this remote area. On the transit south to the area twelve Pollywogs were initiated as Shellbacks in a day-long ceremony at the Equator. The ships officers and crew have been very helpful and supportive through the many ESPs and airgun and OBS launches and recoveries. All is well and everyone is enjoying the near-equatorial sunshine when they have a chance!

John Orcutt
Alistair Harding

Second Weekly Report 22 April

Since the last report we have completed the survey of the 15 degrees 55 minute south overlapping spreading center. The OBSs were launched on 17 April over a period of eleven hours and 47 minutes. During the following days the R/V Ewing shot several across-ridge seismic profiles to collect both reflection data and OBS tomography data while the Washington extended the available SeaBeam data to larger distances from the rise axis. From the evidence available, it appears that the OSC has been propagating to the south with a possible hiatus of northward propagation. The OBS tomography data, coupled with the reflection data, will provide the first glimpse of the crustal and volcanic structure below such an overlapping ridge feature. The OBSs were recovered on 19 April and redeployed in our final survey area south of the Garret Transform Fault at 14 degrees 15 minutes south. Only 36 hours and 40 minutes were required between the start of the first OBS recovery at the OSC and the completion of the final launch at the northern area; six OBSs were launched in less than seven hours. The rise axis at this northern area is very inflated and a magma chamber reflection is quite clear on a single channel monitor record on the R/V Ewing. We are presently shooting a series of nine expanding spread profiles parallel to the rise axis and will complete the experiment with a two-ship, synthetic aperture, constant offset profile of the rise axis to map lateral variation in the magma chamber underlying the spreading center. We have increased the airgun array size to 2600 cubic inches on the Washington. We anticipate recovering the OBSs tomorrow and starting our transit to Manzanillo on Wednesday. The third air compressor installed on the Washington has operated extraordinarily well. It is providing approximately 85% of our compressed air needs while the diesel compressor is supplying the balance. The airguns have been operating flawlessly. The SeaBeam system continues to supply excellent data; the vertical reference gyro on the gravity meter is the only significant repair item during the past week. The two ships have been working well together thanks to the officers and crew and everyone is very pleased with our progress. Even now we are well ahead of our proposed schedule.

John Orcutt Alistair Harding

Third Weekly Report

30 April 1991

We have completed our work on the southern East Pacific Rise and have departed for Manzanillo with all OBSs aboard. The R/V Ewing, our sister ship for the experiment, has now left the East Pacific Rise and is headed for Papette. TERA (Two-Ship Experiment on the Rise Axis) accomplished all the work originally proposed and considerably more. The two ships worked together very efficiently and we were able to extend the number of profiles collected considerably as well as collect three very large OBS tomographic data sets. The last 10 hours at the site consisted of running a synthetic aperture experiment along the rise axis toward the Garret Transform. The northern experiment area, although the slowest spreading, is the most active from a volcanological point of view. The low velocity zone characteristic of spreading centers appears to extend further off the rise axis than at either 9 degrees north or the faster spreading area we surveyed during TERA at 17 degrees south. Although the 15 degree 55 minutes propagating rift does appear to be propagating to the south, the rise axis extending to the south (along the dying rift?) is characterized by a significant low velocity zone at its tip indicative of significant magmatic activity. Some difficulties were encountered with SeaBeam toward the end of the survey at the rise axis and through part of the transit home. A great deal of experimentation with SeaBeam boards and spares appear to have fixed the problem. The cruise has been very successful and the scientific party owes considerable gratitude to the crew of the Washington for their tireless support and interest. The food has been great and the weather's been felicitous. Orcutt conducted his first major experiment (with Bob Detrick; Chief Scientist on the Ewing) on the East Pacific Rise aboard Washington in 1974; there is a touch of sadness in knowing this will almost certainly be the last such trip on this venerable and capable vessel.

John Orcutt
Alistair Harding

	Date	Time	Depth	Latitude	Longitude
Judy					
Launch	4/9/91	08:19Z	2610 m	17° 23.63'S	113° 11.48'W
	Time down	08:58Z	Sink Rate	1.12 m/s	
Launch	4/16/91	18:24:50Z	2669 m	15° 59.24'S	112° 56.829'W
	Time down	19:05Z	Sink Rate	1.08 m/s	
Launch	4/20/91	17:47:20Z	2690 m	14° 7.69'S	112° 31.12'W
Sharyn					
Launch	4/9/91	10:07:37Z	2720 m	17° 19.29'S	113° 14.14'W
	Time down	10:50Z	Sink Rate	1.04 m/s	
Launch	4/16/91	20:38:50Z	3008 m	15° 55.423'S	112° 52.979'W
	Time down	21:23Z	Sink Rate	1.14 m/s	
Launch	4/20/91	23:12:45Z	2850 m	14° 18.91'S	112° 30.55'W
Karen					
Launch	4/9/91	11:19Z	3040 m	17° 18.73'S	113° 16.31'W
	Time down	12:06Z	Sink Rate	1.08 m/s	
Launch	4/17/91	02:03Z	2925 m	15° 57.523'S	113° 2.048'W
	Time down	02:45Z	Sink Rate	1.16 m/s	
Launch	4/21/91	00:39:40Z	2975 m	14° 19.3'S	112° 37.45'W
Opus					
Launch	4/9/91	03:46:45Z	2832 m	17° 20.834'S	113° 7.57'W
	Time down	04:29Z	Sink Rate	1.12 m/s	
Launch	4/17/91	00:02:46Z	2950 m	15° 54.374'S	113° 1.692'W
	Time down	00:48Z	Sink Rate	1.09 m/s	
Launch	4/20/91	21:51:40Z	2640 m	14° 14.94'S	112° 39.03'W
Phred					
Launch	4/9/91	06:27:45Z	2610 m	17° 17.3'S	113° 10.13'W
	Time down	07:12Z	Sink Rate	.983 m/s	
Launch	4/17/91	04:12Z	2640 m	15° 50.431'S	112° 57.764'W
	Time down	04:51Z	Sink Rate	1.13 m/s	
Launch	4/20/91	20:29Z	2899 m	14° 12.09'S	112° 28.7'W
Janice					
Launch	4/9/91	15:12:08Z	2980 m	17° 21.29'S	113° 05.3'W
	Time down	15:57Z	Sink Rate	1.11 m/s	
Launch	4/16/91	22:16:15Z	2760 m	15° 54.648'S	112° 57.374'W
	Time down	22:56Z	Sink Rate	1.16 m/s	
Launch	4/20/91	18:54Z	2940 m	14° 10.79'S	112° 35.29'W

Time required to launch:

- #1 11:26
- #2 9:48
- #3 6:52:20

Launch #1 was the most time consuming because Janice originally returned on a leak and had to be turned around and relaunched. Launch #3 was the shortest since the ship did not remain in the area until the OBS was on the seafloor.

Recovery #	Date	Time released	Approx time on surface	Time on ship
Janice				
1	14 April	23:36Z	00:55Z†	01:05Z
2	19 April	19:19Z	20:41Z*	20:55Z
3	23 April	18:10Z	19:41Z*	19:53Z
Judy				
1	14 April	20:00Z	21:12Z	22:33Z
2	20 April	File Destroyed	01:11Z†	01:20Z
3	23 April	16:14Z	17:23Z*	17:35Z
Karen				
1	15 April	06:22Z	07:52Z	08:12Z
2	19 April	21:31Z	22:56Z*	23:07Z
3	24 April	02:16Z	03:41Z*	04:01Z
Opus				
1	15 April	01:34Z	03:00Z†	03:38Z
2	19 April	12:00Z	13:12Z*	13:25Z
3	23 April	22:34Z	23:34Z	23:49Z
Phred				
1	14 April	18:02Z	19:03Z	18:58Z
2	19 April	14:04:30Z	15:06Z	15:13Z
3	23 April	20:35Z	21:47Z*	21:56Z
Sharyn				
1	15 April	04:35Z	05:53Z†	06:06Z
2	19 April	17:31:30Z	18:35Z†	18:53Z
3	24 April	00:20Z	01:16Z†	01:27Z

* Observed surface times at OBS van

† Observed surface times on bridge

Time required for recovery (Time of first release until last OBS aboard):

#1 13:50

#2 13:11

#3 10:02

The last set of recoveries was the quickest. OBSs were released in this case before getting on site for the recovery in several cases.

Turnaround statistics (Time from first release command until last OBS is launched)

#1→#2 2 da 10 hr 10 m

#2→#3 1 da 12 hr 39 m

Clearly, the last period, just over 36 hours, is the shortest turnaround time for the six OBSs ever achieved!

Drop #	Slope	Seafloor→Surface	mean σ t±Δt @ 3000m
Janice			
1	.57798	.629	0.571
2	.58023	.561	0.012
3	.53931	.538	5255±116 (2.2%)
Judy			
3	.56482	.65	0.607
			0.030
			4939±245 (4.96%)
Karen			
1	.55884		0.566
2	.5705	.587	0.009
3	.53034	.583	5301±85 (1.6%)
Opus			
1	.574	.55	0.616
2	.6464	.683	0.022
3	.62494		4872±171 (3.5%)
Phred			
1	.89032		0.717
2	.7527		0.061
3	.55392	.67	4186±358 (8.6%)
Sharyn			
1	.55219	.581	0.75
2	.9701	.77	0.059
3	.77858	.85	3998±317 (7.93%)

OBS Data Summary

	AREA 1	AREA 2	AREA 3
JANICE	✓	✓	✓
JUDY	✓	✓	✓
PHRED	✓	✓	
OPUS	✓	✓	✓
SHARYN	✓	✓	✓
KAREN			✓

OBS Tilt & Inclination Measurements

	AREA 1	AREA 2	AREA 3
JANICE	✓	Tiltmeters off-scale	✓
JUDY	Off-scale	Tiltmeters off	Tiltmeters off
PHRED	Off-scale	Tiltmeters off	OBS didn't work
OPUS	✓	✓	Tiltmeters off-scale
SHARYN	Y-axis only	Y-axis only	Tiltmeters off
KAREN	OBS didn't work	OBS didn't work	Tiltmeters off

OBS Data Collected

(First two deployments only)

	AREA 1	AREA 2	AREA 3
JANICE	390 MBytes	204 MBytes	205 MBytes
JUDY	404 MBytes	222 MBytes	*
PHRED	300 MBytes	200 MBytes	0 MBytes
OPUS	432 MBytes	174 MBytes	215 MBytes
SHARYN	8 MBytes	280 MBytes	220 MBytes
KAREN	1 KByte	0 MBytes	*

* Data backed up, but not yet quantified.

OBS Equipment Failures

	AREA 1	AREA 2	AREA 3
JANICE		1) Tiltmeters off-scale.	
JUDY	1) No horizontals 2) Tiltmeters & inclinometers off-scale. 3) OBS apparently on its side; both bolts had to be fired and bottom hemisphere was scratched.	1) One horizontal didn't work.	1) One horizontal didn't work.
PHRED	1) Sample rate off by ≈ 0.01 s. 2) Tiltmeters & inclinometers off-scale 3) Horizontals noisy.	1) Clock error continues. 2) Tiltmeters draw excess current.	1) Computer not working on recovery. Pre-deployment test write is still on tape.
OPUS		1) Bad hydrophone	
SHARYN	1) Spit out Exabyte tape after recording 3.5 Hrs of data.	1) Vertical looks bad as does one horizontal. 2) Hydrophone has glitches. 3) X-axis tiltmeter didn't work.	
KAREN	1) Recorded only a compass, 2 diagnostics and a release. 2) Clock error puts "98" in the minutes place.	1) Spit out Exabyte tape before reaching the seafloor. This was the same recorder as used previously in Sharyn. This is an Exabyte-specific problem.	1) 1 Hz glitch on horizontal #2. 2) No sign of clock error seen on first deployment.

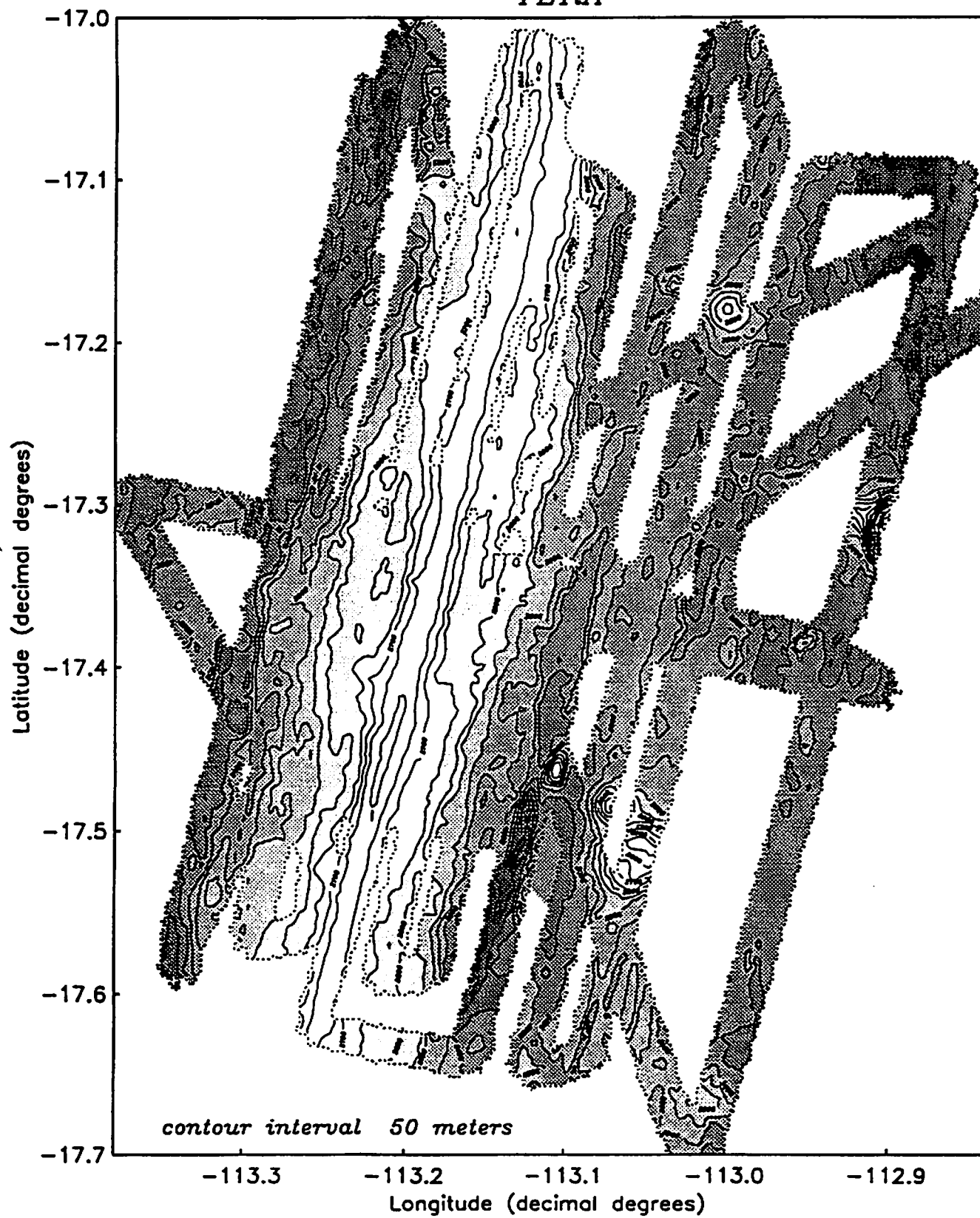
OBS Maintenance Actions

	AREA 1	AREA 2	AREA 3
JANICE			
JUDY			
PHRED	1) Tested in van; no evidence of problem.	1) Replaced some IC's on clock board. Tested, no evidence of problem.	
OPUS			
SHARYN	1) Replaced Exabyte		
KAREN		1) Replaced Exabyte with "new" drive built from part of two (including 4\$23 EPROM's).	

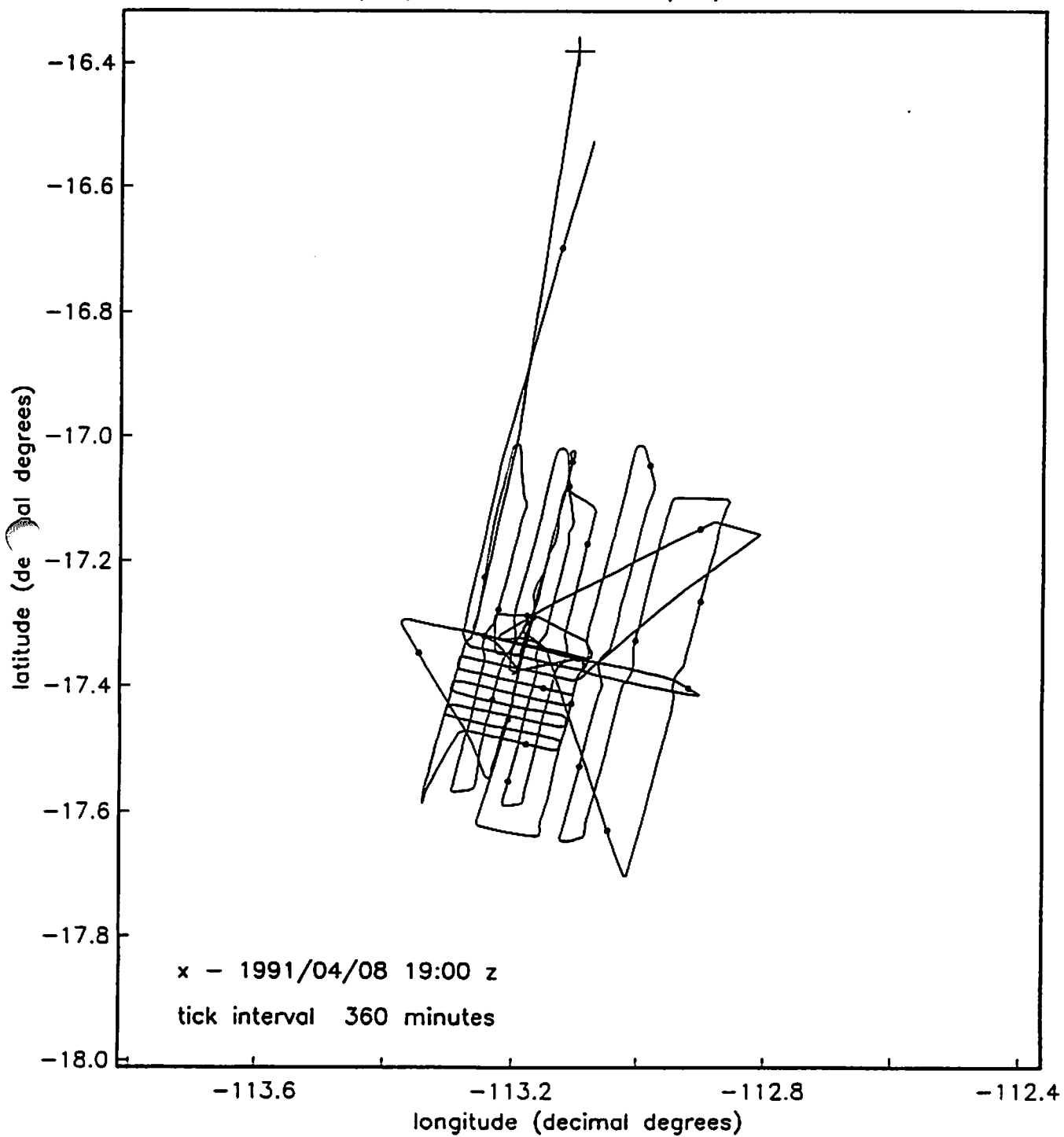
Minimum OBS maintenance required prior to next experiment

OBS	Maintenance/Testing
ALL	<ol style="list-style-type: none"> 1) Check all OBS recordings against the programmed recording schedule to look for anomalies. Did any stop recording early? Are the 1 minute gaps between windows present? When did the OBSs buffer data from memory? How long did it take in each case to buffer from memory? How does this increase with the total recorded? 2) Replace hydrophones and electronics with new versions. Increase the high-end bandwidth to match that of the seismometers. 3) Shake test all the seismometers. Send those needing maintenance to Mark Products. 4) Cold test all OBSs. Karen and Phred should be subjected to long-term cold testing.
JANICE	
JUDY	<ol style="list-style-type: none"> 1) Return seismometer to Mark Products for maintenance. 2) Weak acoustics. 3) Repair tilt ribbon.
PHRED	<ol style="list-style-type: none"> 1) Investigate and repair peculiar clock problem. Will require testing near 0°C. 2) Bad compass/tilt system; draws excess current (40mA).
OPUS	<ol style="list-style-type: none"> 1) Repair tilt ribbon. 2) Investigate problem with OPUS' original CPU running in all other OBSs, but not in OPUS' card cage.
SHARYN	<ol style="list-style-type: none"> 1) Repair X-axis element. 2) Return seismometer to Mark Products for maintenance. 3) Investigate and repair "glitch" problem on hydrophone channel. 4) Repair tilt ribbon.
KAREN	<ol style="list-style-type: none"> 1) Repair 1Hz "glitch" problem on horizontal #2.

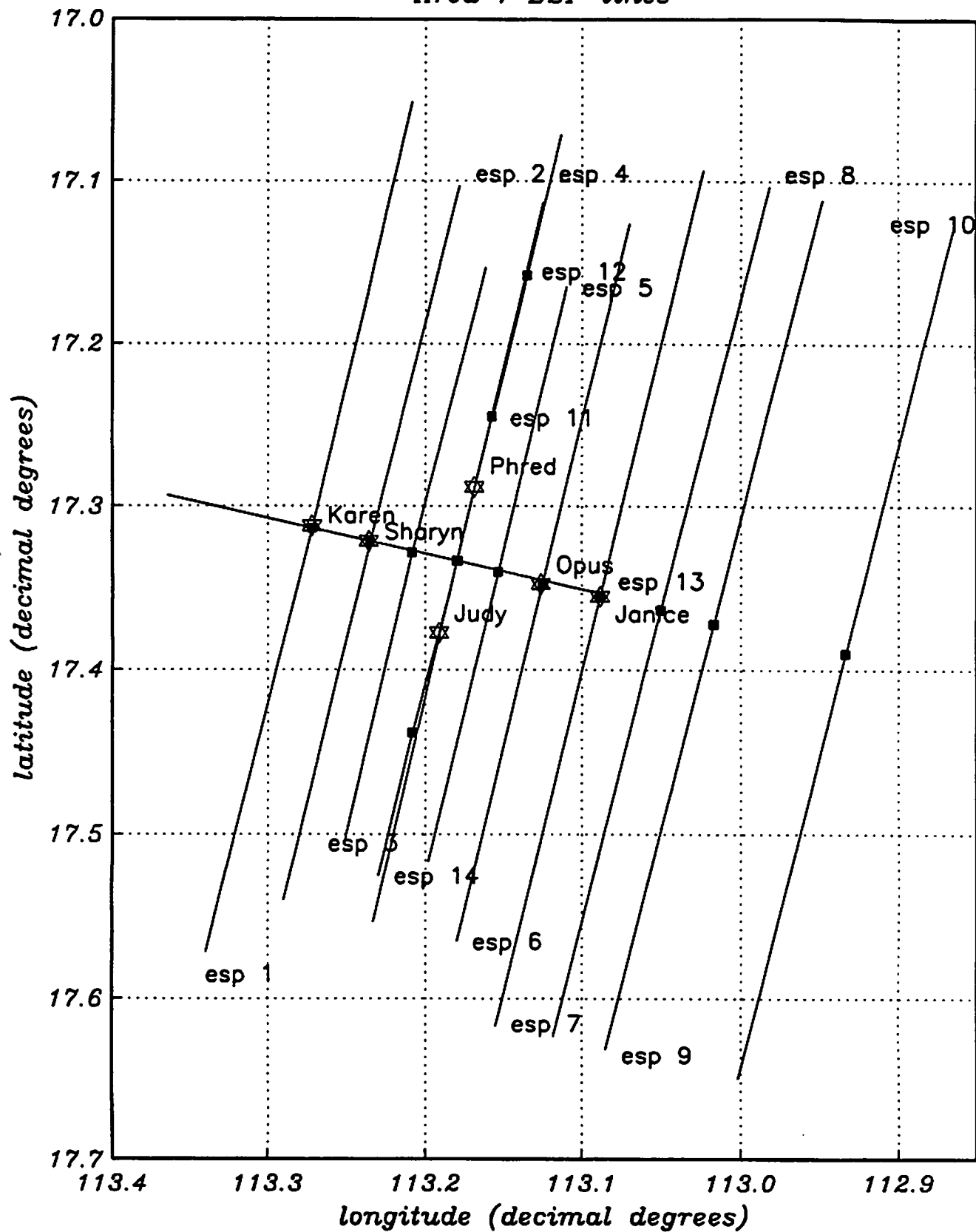
TERA



1991/04/08 19:00 z to 1991/04/15 13:00 z



Area 1 ESP lines



R/V Washington Airgun Operations in Area 1:
17° 05'S - 17° 35'S: April 9-14 th 1991

OBS 1

	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 23.24' S	112° 56.85' W	99	18:30	G
End	17° 19.89' S	113° 11.79' W	99	21:30	G

Comments

A preliminary airgun line perpendicular to the rise-axis and going over the OBS's. The line started to the east of OBS Janice and continuing until it just crossed the rise-axis.

Airgun Log

Airguns: 300, 550, 150, 200 cu. in.
 Total Capacity: 1200 cu. in.
 Firing rate: 60 secs on 00

Report:

A total of 181 shots were fired with no down time.

ESP 1

	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 34.3' S	113° 20.4' W	100	13:22	G
Midpoint	17° 18.8' S	113° 16.3' W	100	16:54	O
End	17° 03.1' S	113° 12.5' W	100	20:10	O

Line Length: 59.5 km
 Offset from Ridge: 10.0 km
 Approximate age 130 ka

Comments

Sharp break from line 1 Nm ahead of Ewing and a slow tail back on the line. OBS Karen was situated at center of line.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
 Total Capacity: 2600 cu. in.
 Firing rate: 60 secs on 00
 Target speed 5 kts.

Report:

14:05 Guns in water
 17:00 Pulled gun #4 (760 cu. in.) - broken O-ring
 17:06-17:09 Disabled gun #2 (550 cu. in.) - guns jumped
 17:41 Gun #4 (760 cu. in.) back on line

ESP 2

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 06.2'S	113° 10.7'W	100	21:49	O
Midpoint	17° 19.3'S	113° 14.1'W	101	0:42	O
End	17° 32.4'S	113° 17.4'W	101	3:20	O

Line Length: 50.0 km
Offset from Ridge: 6.0 km
Approximate age 80 ka

Comments

OBS Sharyn was deployed at the center point of ESP 2.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00

Report:

22:28 Airgun #4 (760 cu. in.) turned off.
22:40 Airgun #2 (550 cu. in.) misfired
22:50 Airgun #2 off
23:24 Airgun #2 on
00:00 All guns on including #4 (760 cu. in.)
02:34 Airgun #4 off
03:50 Airgun #4 on
03:57 All guns secured.

ESP 3

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 30.3'S	113° 15.1'W	101	4:55	O
Midpoint	17° 19.7'S	113° 12.5'W	101	7:10	O
End	17° 09.2'S	113° 09.7'W	101	9:25	O

Line Length: 40.2 km
Offset from Ridge: 3.1 km
Approximate age 40 ka

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00
Target Speed 4.8 kts

Report:

05:55 1 delayed shot
06:30 Airgun #2 (550 cu. in.) off
06:50 All guns off
06:55 All guns except #2 back on
07:06 Airgun #2 on

07:26 Air pressure 1300 p.s.i.
 07:29 Airgun #4 (760 cu. in.) down
 08:20 Airgun #1 & #3 (300 & 640 cu. in.) down
 08:36 Airgun #1 & #3 back up
 09:19-09:20 Airgun #1 & #2 misfire
 09:22 Airgun #1 back up.

ESP 4

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 06.8'S	113° 07.5'W	102	1:49	O
Midpoint	17° 20.0'S	113° 10.8'W	102	4:32	O
End	17° 33.2'S	113° 14.0'W	102	7:15	O

Line Length: 50.2 km
 Offset from Ridge: 0 km
 Approximate age 0 ka

Comments

The long rise-axis ESP for Area 1. The R/V Washington passed over OBS Phred at 03:58z and over OBS Judy at 05:07z.

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
 Total Capacity: 2390 cu. in.
 Firing rate: 60 secs on 00

Report:

Two guns were transferred to gun control lines 7 & 8 during this ESP?
 03:31 Lost gun #4 (550 cu.in.). Low pressure 1000 p.s.i.
 04:33 Gun #4 back on line at midpoint of ESP.
 05:20 Gun #3 misfires.
 06:02 Guns #1, 2, 4, & 5 misfire.
 06:20 Guns #7 & 8 misfire (550 & 550 cu. in. ?). Pressure 1700 p.s.i.
 06:42 All guns down.
 06:44 All guns except #7 back.
 07:21 Gun #3 back.
 07:45 All guns off.

ESP 5

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 09.9'S	113° 06.6'W	101	13:11	O
Midpoint	17° 20.4'S	113° 09.2'W	101	15:25	G
End	17° 31.0'S	113° 11.9'W	101	17:37	O

Line Length: 40.2 km
 Offset from Ridge: 2.9 km
 Approximate age 40 ka

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.

Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00

Report:

17:30 Airgun #4 did not fire.

ESP 6

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 33.9'S	113° 10.8'W	101	19:10	G
Midpoint	17° 20.8'S	113° 07.5'W	101	21:55	G
End	17° 07.6'S	113° 04.2'W	102	0:32	O

Line Length: 50.1 km
Offset from Ridge: 6.0 km
Approximate age 80 ka

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
Total Capacity: 2390 cu. in.
Firing rate: 60 secs on 00

Report:

19:10 Changed airgun #4 from 760 cu.in. to 550 cu.in. This chamber size was kept for the remainder of Area 1 esp's
20:55 All guns misfired.
22:10(approx) Guns firing at 34 secs and not on minute mark.
22:17 Resynced firing clock to the minute mark.

ESP 7

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 37.0'S	113° 09.3'W	102	9:35	G
Midpoint	17° 21.3'S	113° 05.3'W	102	12:58	G
End	17° 05.6'S	113° 01.4'W	102	16:23	G

Line Length: 59.8km
Offset from Ridge: 10.0 km
Approximate age 130 ka

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
Total Capacity: 2390 cu. in.
Firing rate: 60 secs on 00

Report:

09:32 All guns on except gun #4 (550 cu. in.)
11:03 Gun #4 back on
11:07-08 All guns misfire
11:09 3 guns fire.
11:10-11:11 Guns #2 & 4 misfire.
11:18 All guns on.

12:14 Guns #1, 2, & 4 off
 12:15-12:16 Gun #2 off.
 13:04-13:05 Gun #3 misfires.
 13:06-13:07 Gun #2 misfires
 13:09-13:11 Gun #2 misfires
 13:17-13:22 All guns down
 13:22 Misfire at 41 secs
 13:23 Misfire at 38 secs
 13:26-13:28 All guns down.
 13:38-13:52 All guns down.
 14:02-14:05 3 guns misfire
 14:07 3 guns misfire
 14:09 R/V Ewing stops recording data & both ships take 5 hr break for repairs.
 R/V Washington at 17° 15.65' S, 113° 03.95' W

ESP 8

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 06.2'S	112° 58.9'W	102	18:45	G
Midpoint	17° 21.8'S	113° 03.0'W	102	22:03	G
End	17° 37.4'S	113° 07.1'W	103	1:05	O

Line Length: 59.6 km
 Offset from Ridge: 14.2 km
 Approximate age 160 ka

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
 Total Capacity: 2390 cu. in.
 Firing rate: 60 secs on 00

Report:

18:48 5 guns on: 300, 550, 550, 150 & 200 cu. in.
 18:52 Gun #3 (640 cu. in.) on.
 18:53 Gun #3 off.
 18:59 Gun #3 on.
 19:38 Gun #3 did not fire.

ESP 9

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 37.9'S	113° 05.1'W	103	2:04	O
Midpoint	17° 22.3'S	113° 01.1'W	103	5:23	O
End	17° 06.7'S	112° 56.9'W	103	8:43	O

Line Length: 59.6 km
 Offset from Ridge: 17.8 km
 Approximate age 230 ka

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
 Total Capacity: 2390 cu. in.

Firing rate: 60 secs on 00

Report:

07:19 Guns #1 thru 5 misfire.
07:27 All guns fire.
07:30 All guns misfire.
07:35 All guns on except #1
07:39 All guns on.
08:22-08:24 Guns #1, 2, 3, & 4 misfire.
08:28 Guns #2 & 4 misfire.
08:35 Missed shot.
08:36 All guns on except #2
08:45 Airguns turned off at end of line.

ESP 10

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 07.8'S	112° 51.9'W	103	10:22	OG
Midpoint	17° 23.4'S	112° 56.0'W	103	13:38	G
End	17° 39.0'S	113° 00.1'W	103	16:47	G

Line Length: 59.6 km
Offset from Ridge: 26.9 km
Approximate age 345 ka

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
Total Capacity: 2390 cu. in.
Firing rate: 60 secs on 00

Report:

11:53 Airguns #1, 3, 4, & 5 misfiring
11:54 Airguns #1, 3, & 4 misfiring.
11:59 All guns back on.
12:24 Guns #1, 3, & 4 misfiring.
15:23 Guns misfire.

ESP 11

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 14.7'S	113° 09.4'W	103	21:27	OG
Midpoint	17° 09.5'S	113° 08.1'W	103	22:31	O
End	17° 04.3'S	113° 06.8'W	103	23:36	O

Line Length: 19.8 km
Offset from Ridge: 0 km
Approximate age 0 ka

Comments

A short line along the rise-axis.

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
Total Capacity: 2390 cu. in.
Firing rate: 60 secs on 00

Report:

20:36 All guns on.
20:37 Guns misfire.
20:48 Guns misfire.
23:09 Resync firing timer.

ESP 12

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 09.5'S	113° 08.15'W	104	1:50	O
Midpoint	17° 14.7'S	113° 09.45'W	104	2:56	G
End	17° 19.9'S	113° 10.75'W	104	3:58	G

Line Length: 19.8 km
Offset from Ridge: 0 km
Approximate age 0 ka

Comments

A short line along the rise-axis.
R/V Washington passed overhead of OBS Phred at .03:33z.

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
Total Capacity: 2390 cu. in.
Firing rate: 60 secs on 00

Report:

All airguns worked throughout experiment.

ESP 13

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
R/V Washington					
Start	17° 21.20'S	113° 05.20'W	104	7:54	O
Midpoint	17° 20.00'S	113° 10.75'W	104	9:01	O
End	17° 17.60'S	113° 21.85'W	104	11:14	OG

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
R/V Ewing					
Start	17° 18.80'S	113° 16.30'W	104	7:54	O
Midpoint	17° 20.00'S	113° 10.75'W	104	9:01	O
End	17° 22.45'S	112° 59.65'W	104	11:14	O

Line Length: 30.2 km
Offset from Ridge: 10.1km at start & 20.1 km at finish.
Approximate age 0-260 ka

Comments

A ridge perpendicular ESP along the center points of the ridge parallel ESPs. The 2 ships started 10 km from the ridge with the R/V Washington & R/V Ewing over OBS's Janice & Karen respectively and finished 20 km from the ridge.

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
Total Capacity: 2390 cu. in.
Firing rate: 60 secs on 00

Report:

Guns 2 & 4 (?) were being fired from gun control units 7 & 8 during ESP.

07:55 First shot.
08:37 Guns #1, 3, & 5 misfire.
08:40 All guns down. Gun control system is rebooted.
08:47 Guns # 6, 2, & 4 back up. (200, 550 & 550 cu. in.)
08:48 All guns back up.
10:17 Guns #1, 3, & 5 misfire.(300, 640, & 150 cu. in.)
10:18 Gun #5 down.
10:24 Gun control system is rebooted.
10:26 All guns are firing O.K.
10:27 Gun #5 misfires.
10:31 All guns misfire.

ESP 14

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	17° 31.5'S	113° 13.8'W	104	14:49	O
Midpoint	17° 26.3'S	113° 12.5'W	104	15:56	G
End	17° 21.1'S	113° 11.05'W	104	17:06	OG

Line Length: 0 km
Offset from Ridge: 0 km
Approximate age 0 ka

Comments

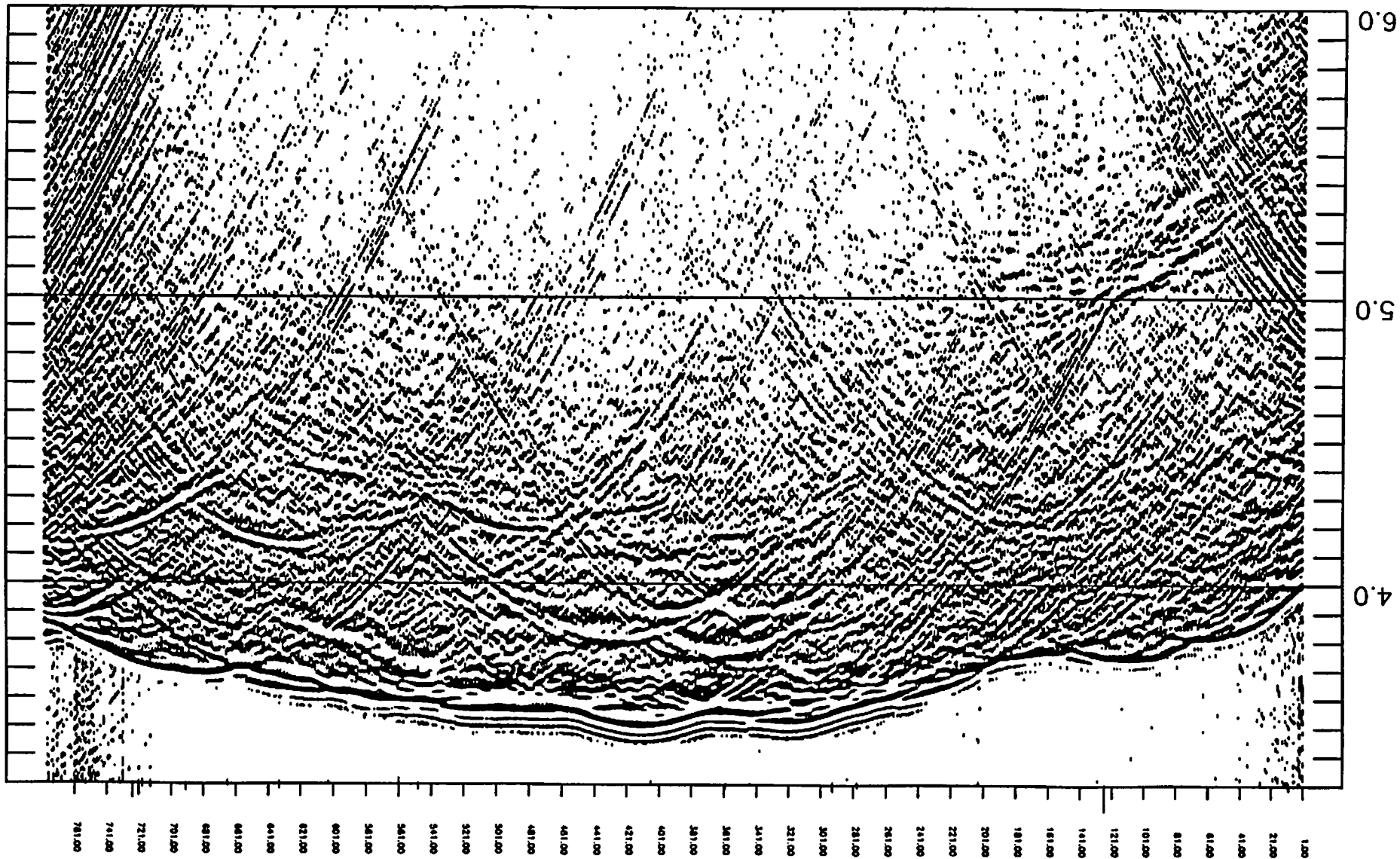
A short line along the rise-axis in the southern part of the survey area.
R/V Washington passed over OBS judy at 16:44z. (17° 22.6' S).

Airgun Log

Airguns: 300, 550, 640, 550, 150, 200 cu. in.
Total Capacity: 2390 cu. in.
Firing rate: 60 secs on 00

Report:

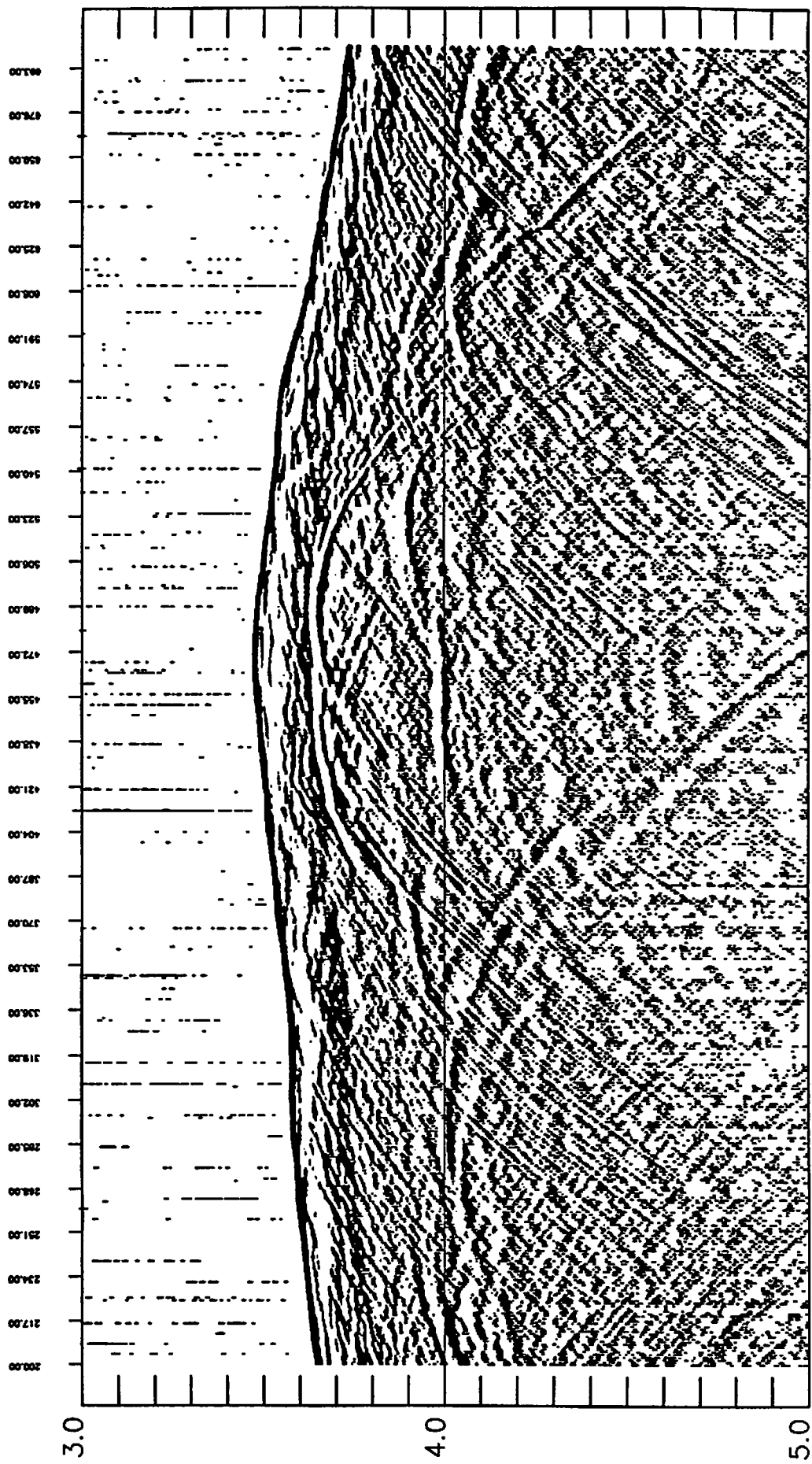
All guns worked throughout ESP.



CDP LINE: SEPR 11

STACKING VELOCITIES DERIVED FROM CYS ANALYSIS.

12.5m bins (25 FOLD)



Area 1 Velocity profiles

XBT #1

Location: 17° 19.4'S 113° 13.3'W
Date: 9th April 1991 (Julian day 99).

XBT data

Temperature (°C)	Depth (m)
26.0	1.2
25.0	69.2
24.0	74.1
23.0	111.2
22.0	162.4
21.0	187.9
20.0	206.9
19.0	222.5
18.0	237.1
17.0	260.1
16.0	269.6
15.0	281.7
14.0	289.6
13.0	303.2
12.0	317.3
11.0	331.9
10.0	358.5
9.0	398.6
8.0	445.6

XBT selected points

Temperature (°C)	Depth (m)
25.8	2.6
25.5	66.4
23.7	79.9
23.2	100.0
21.8	167.4
20.3	200.0
18.5	228.9
16.5	265.5
13.8	295.0
13.4	300.0
11.8	321.3
10.4	343.2
8.9	400.0
7.8	459.7

Velocity function

Velocity (m/s)	Depth (m)
1535	3
1536	66
1532	80
1528	167
1496	343
1481	800
1487	1500
1499	2500
1548	5500

Notes:

Velocities as entered into Sea Beam

Carter Table Area 54 used at depths of 800m or greater

XBT #2

Location: 17° 26.9'S 113° 06.5'W

Date: 13th April 1991 (Julian day 103).

Temperature (°C)	Depth (m)
26	0.7
25	67.0
24	70.9
23	110.6
22	156.3
22	160.8
22	161.3
21	181.9
20	199.0
19	221.2
18	238.2
17	256.0
16	273.5
15	286.5
14	301.4
13	318.3
12	334.6
11	351.3
10	378.4
9	413.6
8	446.9

Selected Pairs:

Temperature (°C)	Depth (m)
25.5	2.6

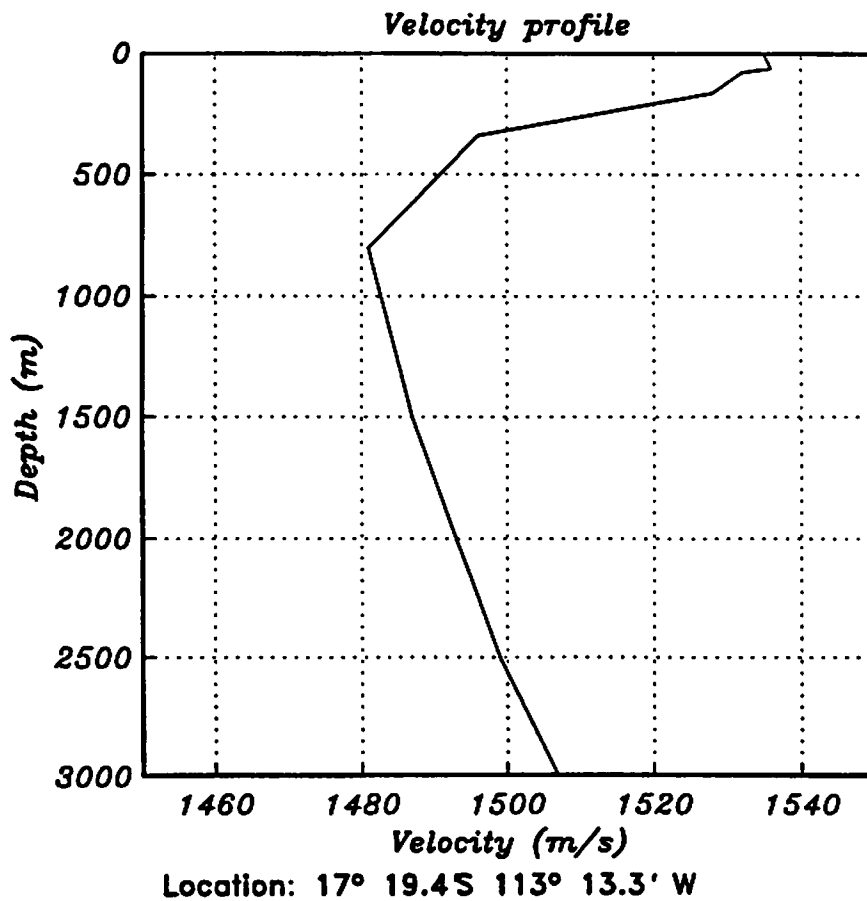
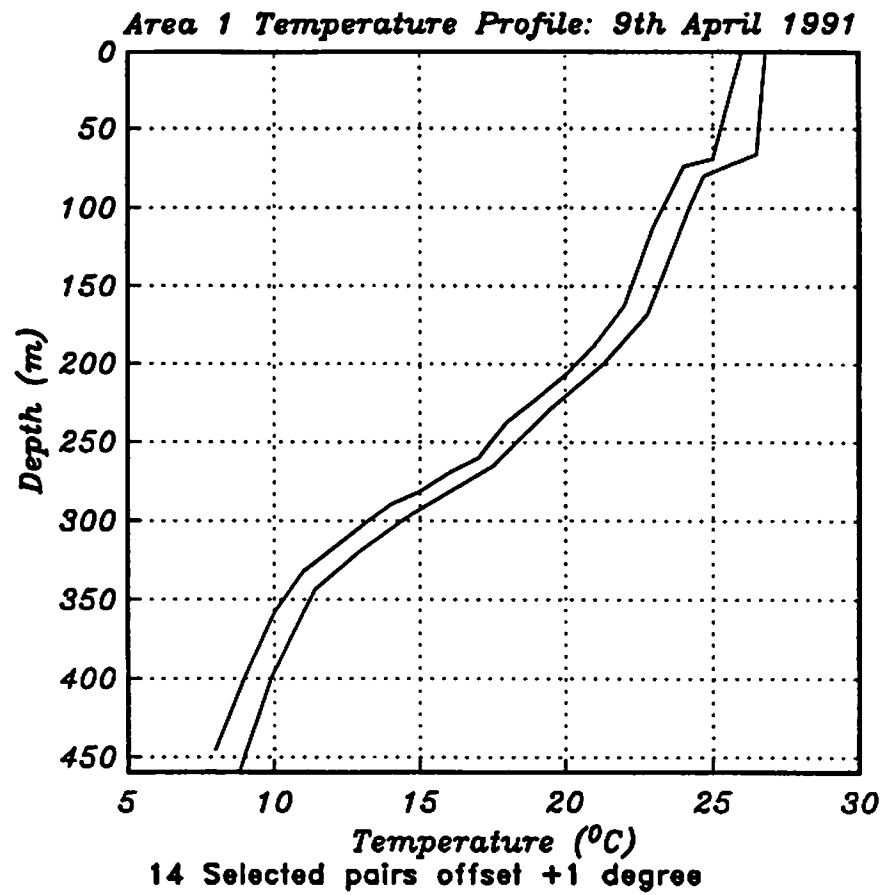
25.3	66.4
23.7	75.4
23.2	100.0
21.7	170.0
20.0	200.0
17.0	256.1
14.0	300.0
10.9	353.8
9.4	400.0
8.2	444.3
7.8	459.7

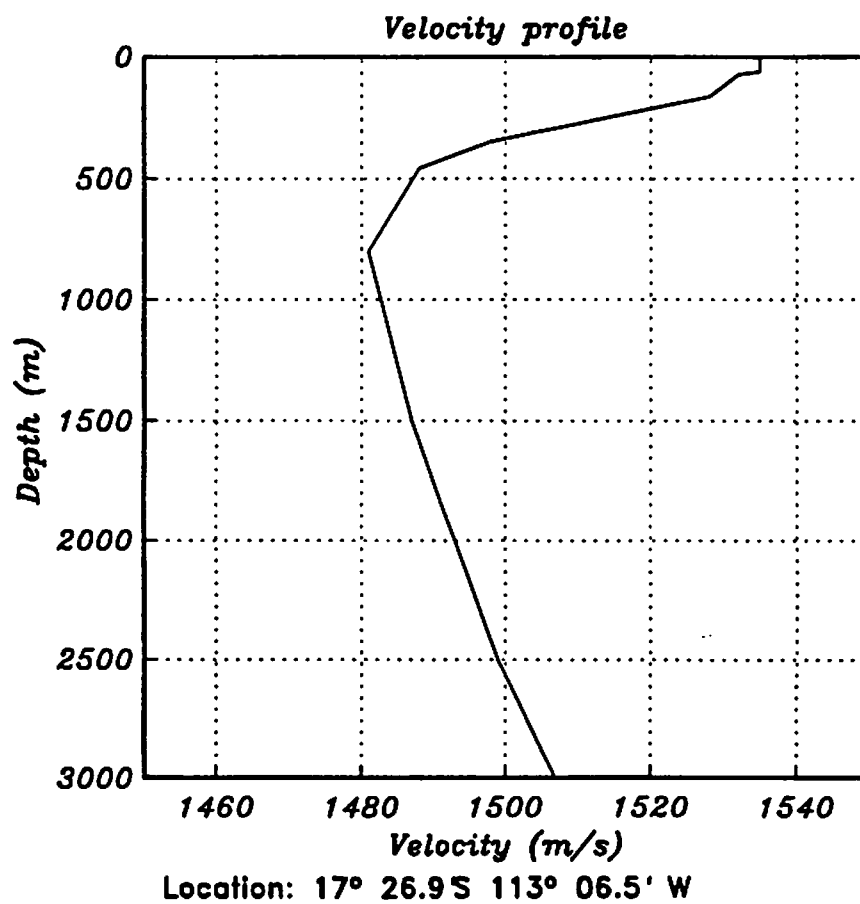
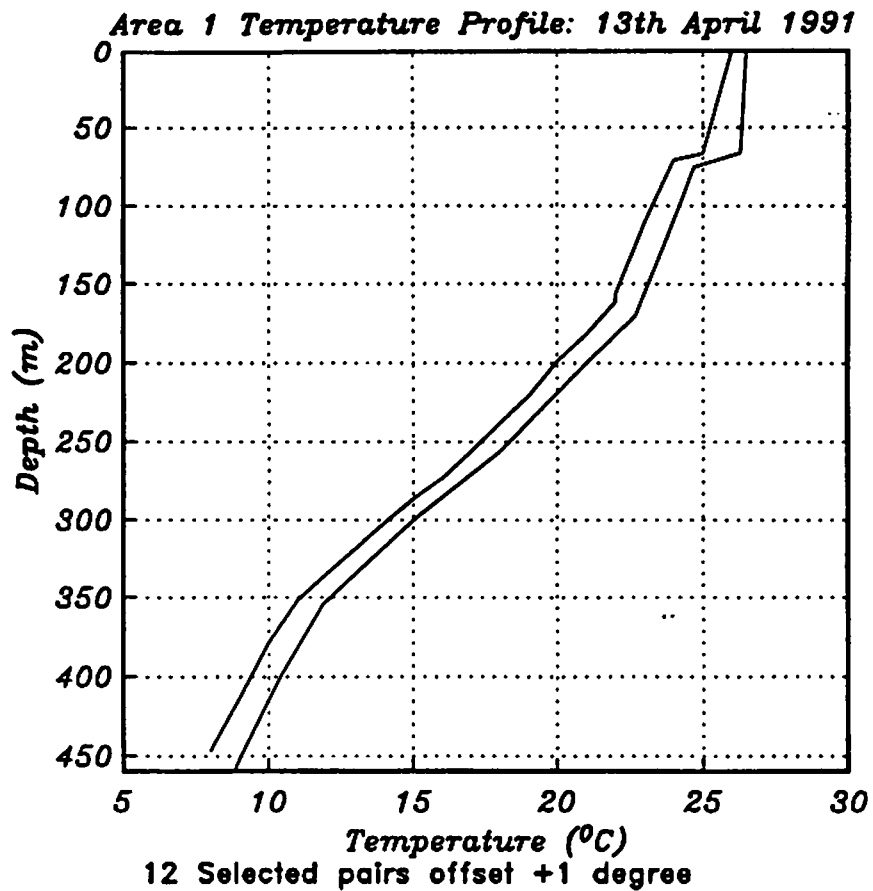
Velocity function

Velocity (m/s)	Depth (m)
1535	3
1535	66
1532	75
1528	170
1498	354
1488	460
1481	800
1487	1500
1499	2500
1548	5500
1606	8500

Notes:

Carter Table Area 54 used at depths of 800m or greater





TERA TIME SHIFT 1

TIME	OFFSET(USEC)	TIME	DELTA T (DAYS)	DELTA T (SEC)	DRIFT (USEC)	INIT. OFFSET (USEC)	DRIFT RATE (USEC/SEC)
DEPLOYMENT 1							
PHRED							
099/0602	658	4/9/91 6:02				PHRED	
104/1933	-7140	4/14/91 19:33	5.563194444	480660	-7798	658	-0.016223526
KAREN							
099/1059	1500	4/9/91 10:59				KAREN	
105/0825	-8720	4/15/91 8:25	5.893055556	509160	-10220	1500	-0.020072276
JUDY							
099/0736	670	4/9/91 7:36				JUDY	
104/2255	-12400	4/14/91 22:55	5.638194444	487140	-13070	670	-0.026830069
JANICE							
099/1336	218	4/9/91 13:36				JANICE	
105/0204	1070	4/15/91 2:04	5.519444444	476880	852	218	0.001786613
SHARYN							
099/0942	1080	4/9/91 9:42				SHARYN	
105/0627	-9600	4/15/91 6:27	5.864583333	506700	-10680	1080	-0.021077561
OPUS							
099/0330	675	4/9/91 3:30				OPUS	
105/0353	12300	4/15/91 3:53	6.015972222	519780	11625	675	0.022365231

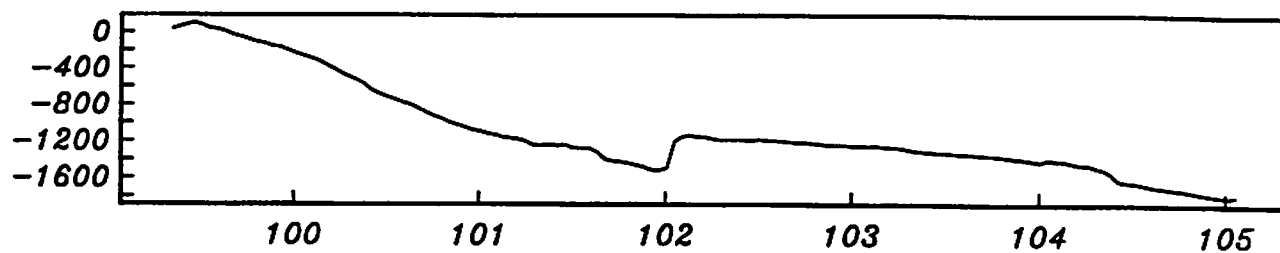
**TERA O1
OBS TIME LOG**

DEPLOYMENT NO. 1

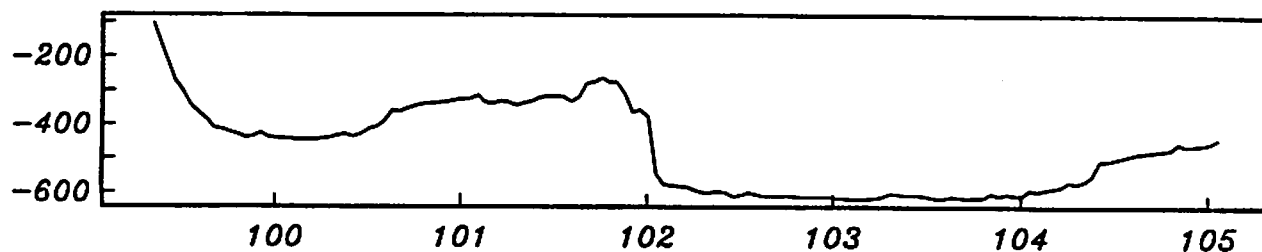
OBS	EVENT	TIME(Z)	OFFSET(μS)
PHRED	Final Clock Set	096/2149	+461
"	Clock Check	099/0520	+658
"	Clock Check	099/0602	+658
"	Post Recovery	104/1933	-7140
"	Post Recovery	105/1637	-7070
KAREN	Final Clock Set	097/0418	+347
"	Clock Check	099/1031	+1500
"	Clock Check	099/1059	+1500
"	Post Recovery	105/0825	-8720
"	Post Recovery	106/0536	-(?)9220
JUDY	Final Clock Set	097/0034	+355
"	Clock Check	099/0656	+724
"	Clock Check	099/0736	+670
"	Post Recovery	104/2255	-12400
"	Post Recovery	105/1859	-13300
JANICE	Final Clock Set	096/1728	+315
"	Clock Check	099/0055	+305
"	Final Clock Set	099/1223	+270
"	Clock Check	099/1336	+218
"	Post Recovery	105/0204	+1070
"	Post Recovery	105/2133	+1240
SHARYN	Final Clock Set	097/1706	+318
"	Final Clock Set	099/0854	+1140
"	Clock Check	099/0942	+1080
"	Post Recovery	105/0627	-9600
"	Post Recovery	106/0326	-10000
OPUS	Final Clock Set	098/0045	+474
"	Final Clock Set	099/0239	+538
"	Clock Check	099/0330	+675
"	Post Recovery	105/0353	+12300
"	Post Recovery	106/0037	+14100

Opus Deployment 1

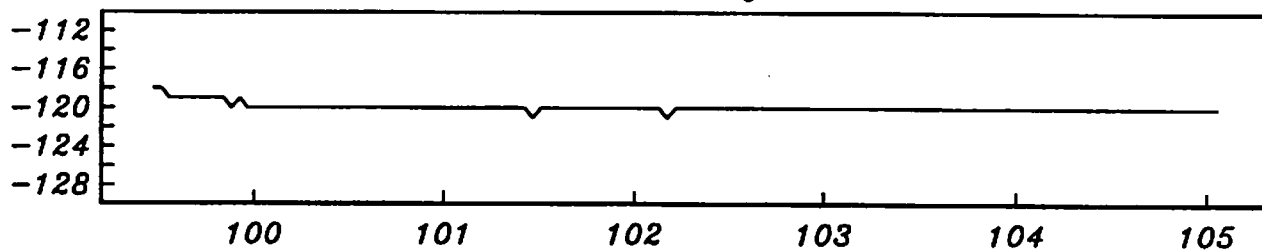
Tiltmeter X



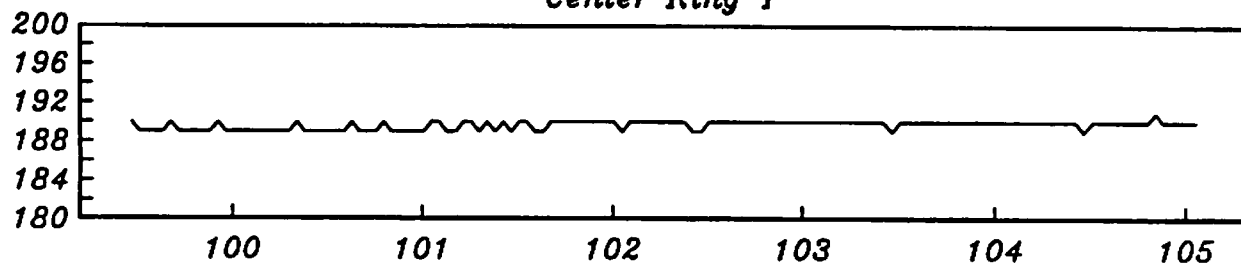
Tiltmeter Y



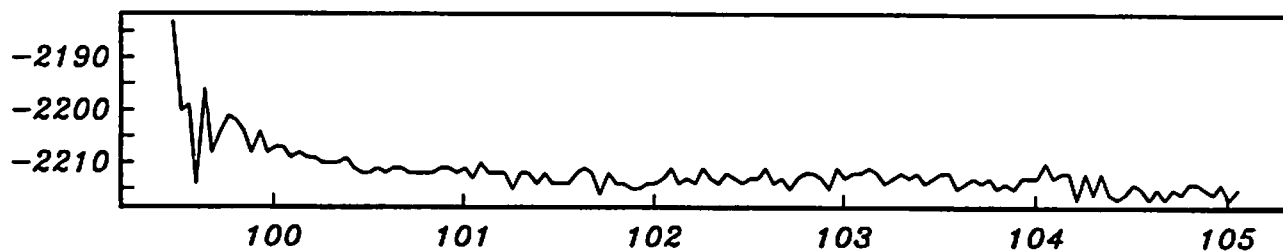
Center Ring X



Center Ring Y



Taco Pounder X



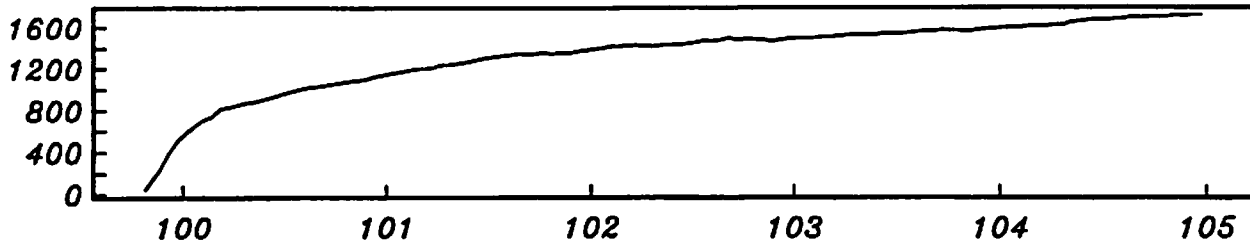
Taco Pounder Y



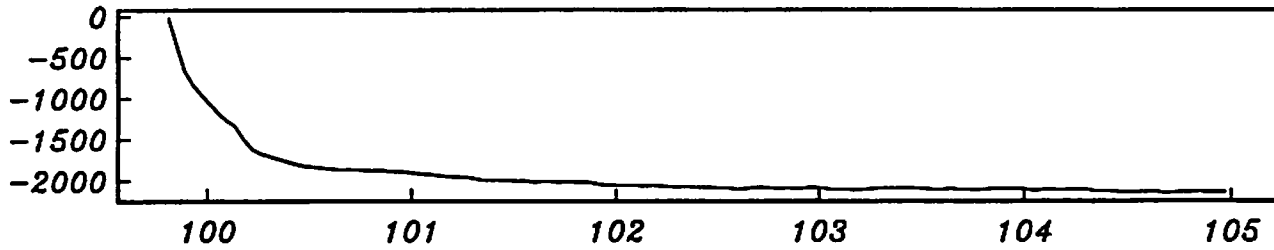
Julian Date

Janice Deployment 1

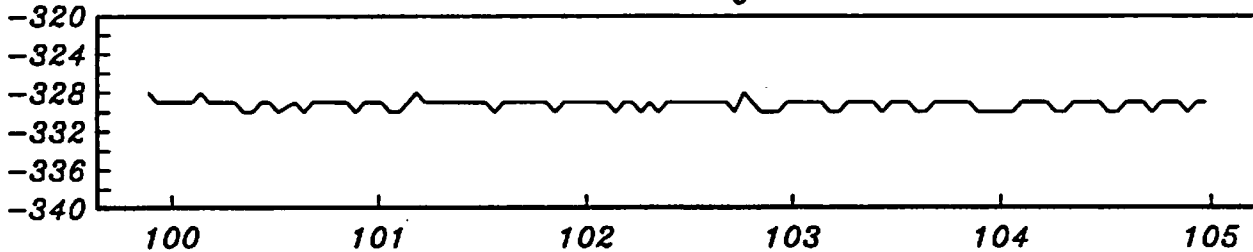
Tiltmeter X



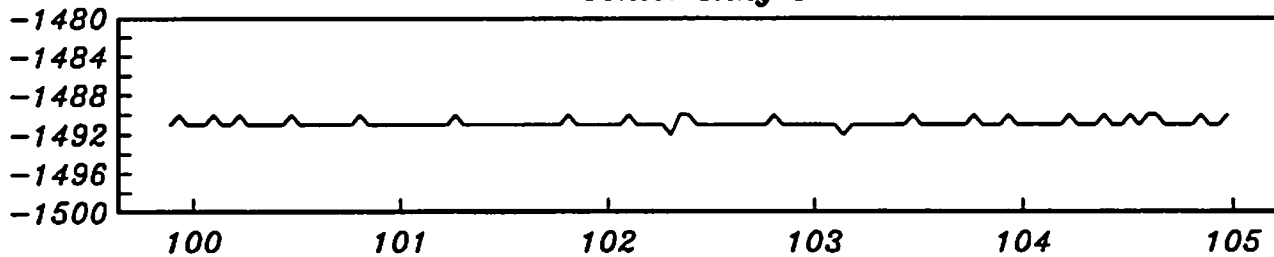
Tiltmeter Y



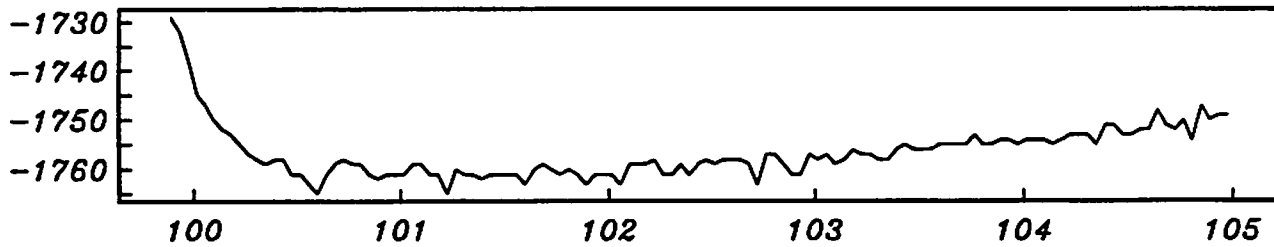
Center Ring X



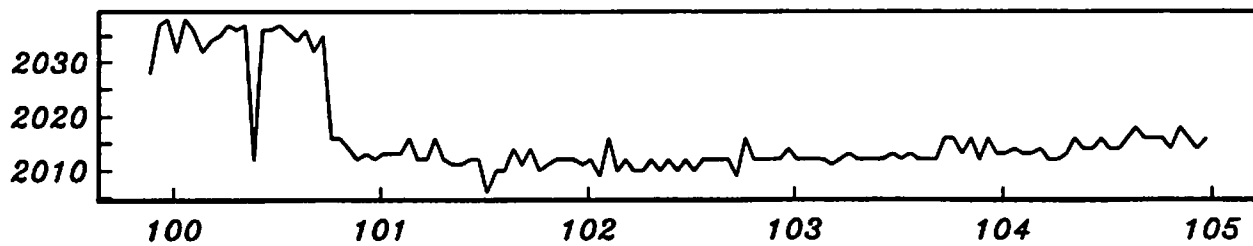
Center Ring Y



Taco Pounder X



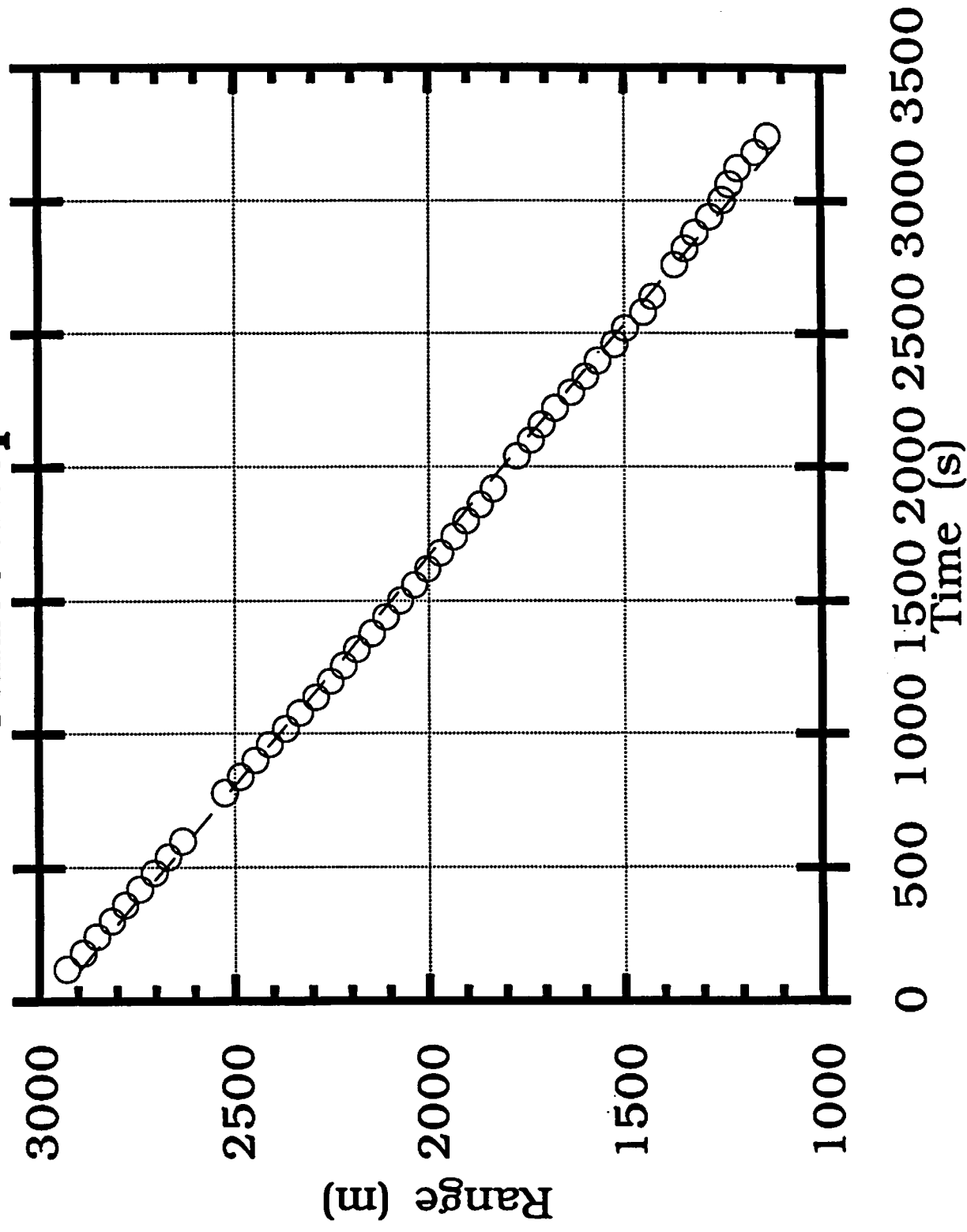
Taco Pounder Y



Julian Date

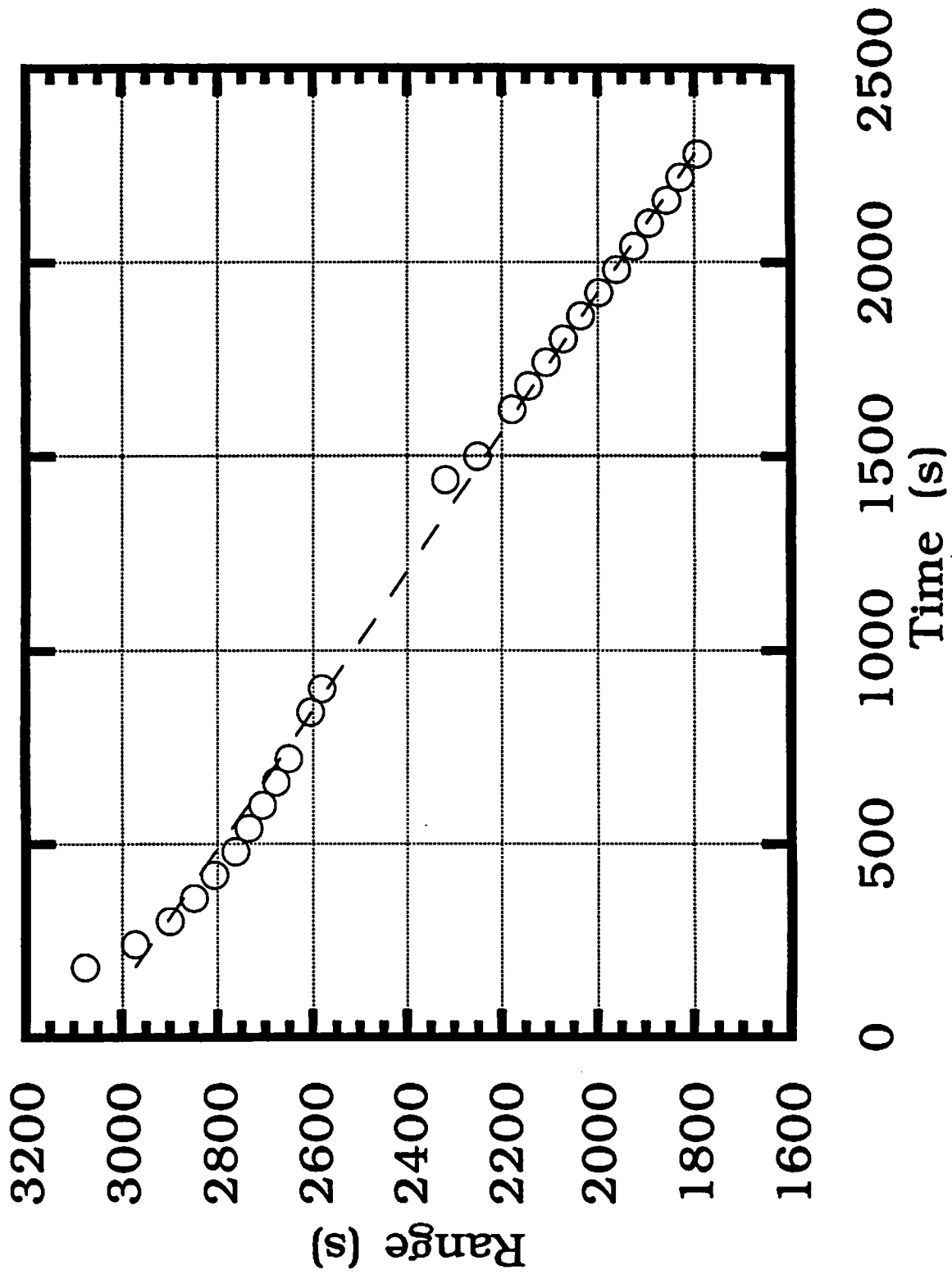
--y = 2965.2 + -0.57798x R= 0.99919

Janice Drop #1



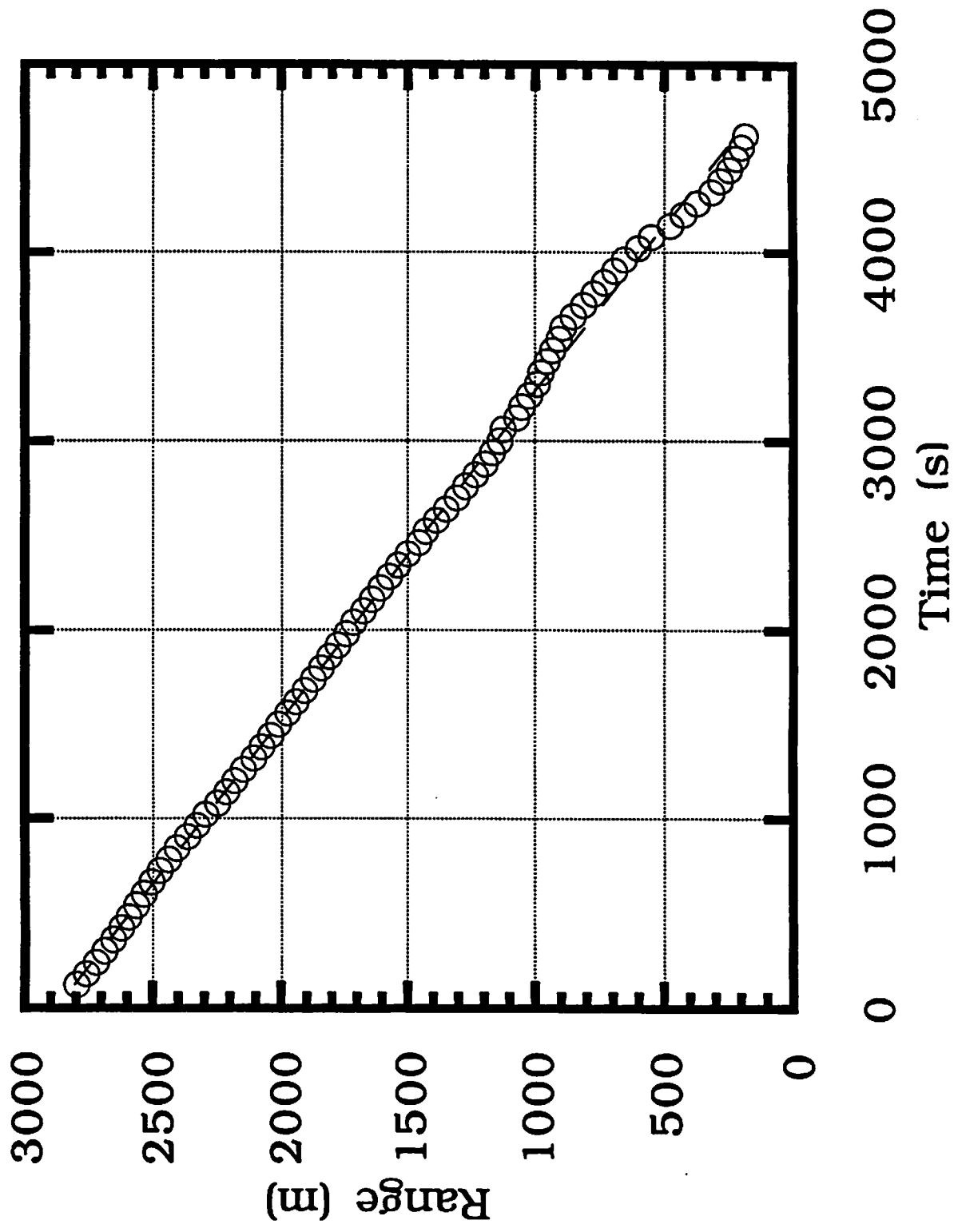
$$--y = 3072.4 + -0.55884x \quad R= 0.99735$$

Karen Drop #1



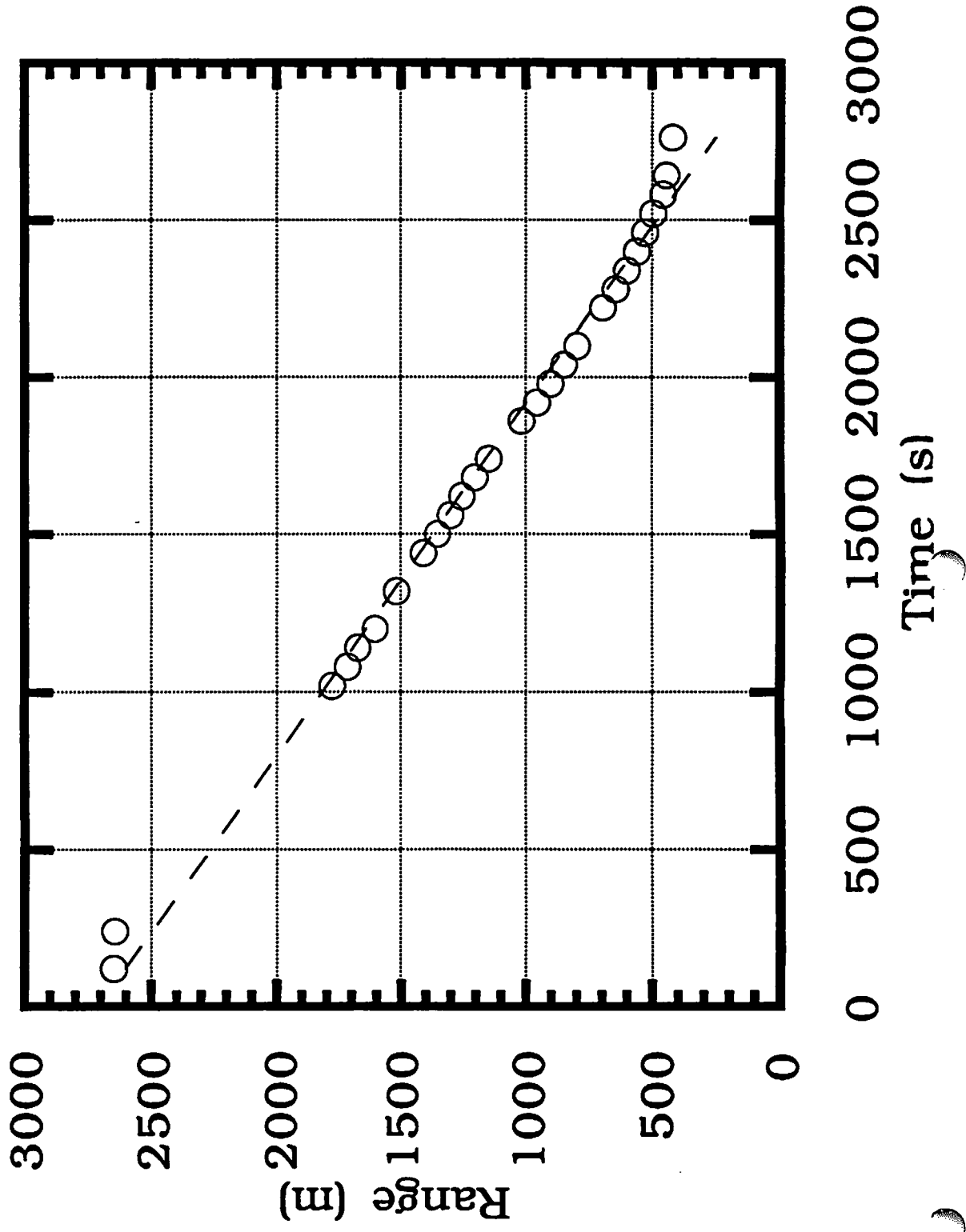
--- $-y = 2876 + -0.574x$ $R = 0.99905$

Opus Drop #1



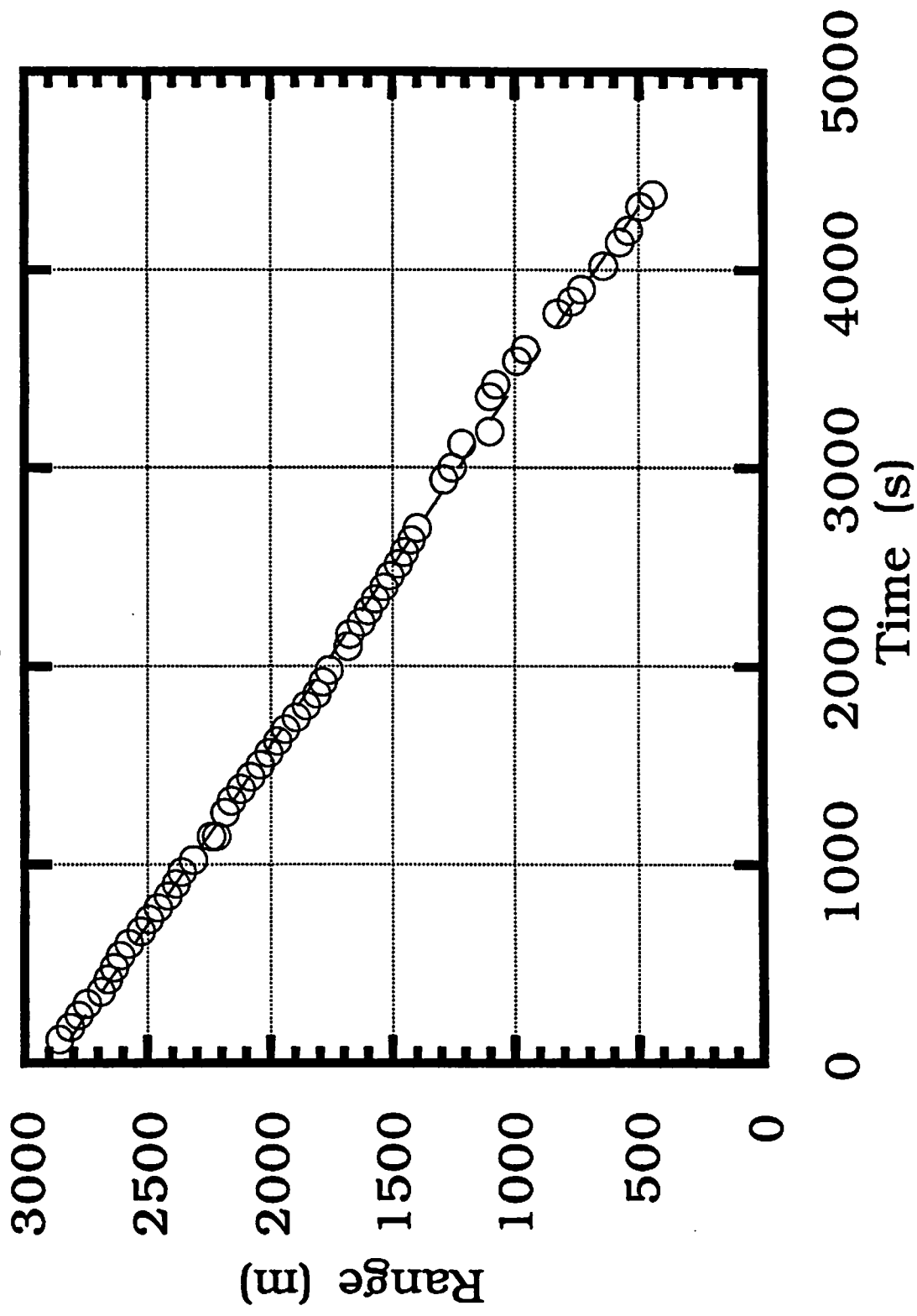
$$---y = 2709 + -0.89032x \quad R= 0.9959$$

Phred Drop #1

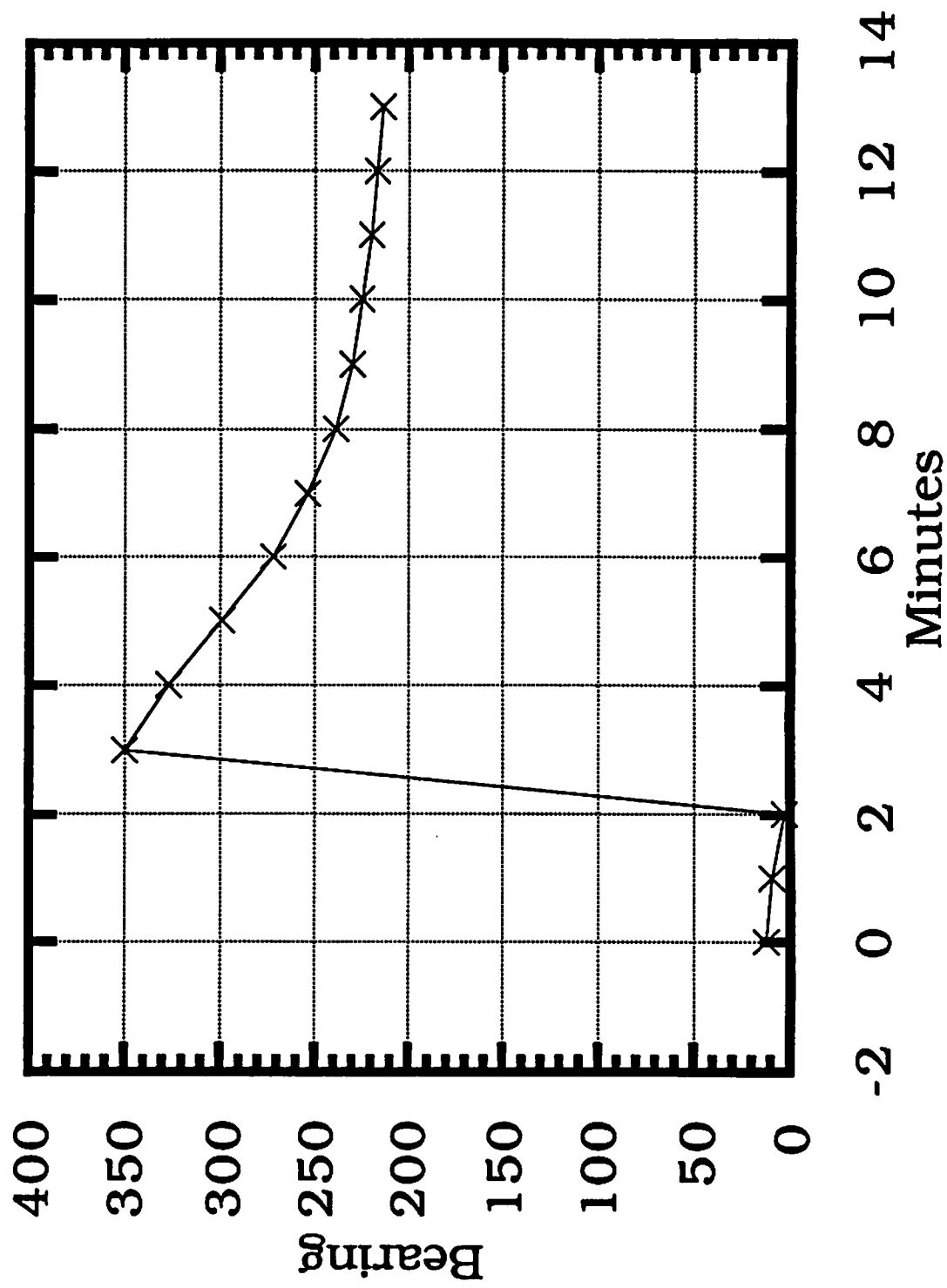


-- $-y = 2884.8 + -0.55219x$ $R = 0.99914$

Sharyn Drop #1

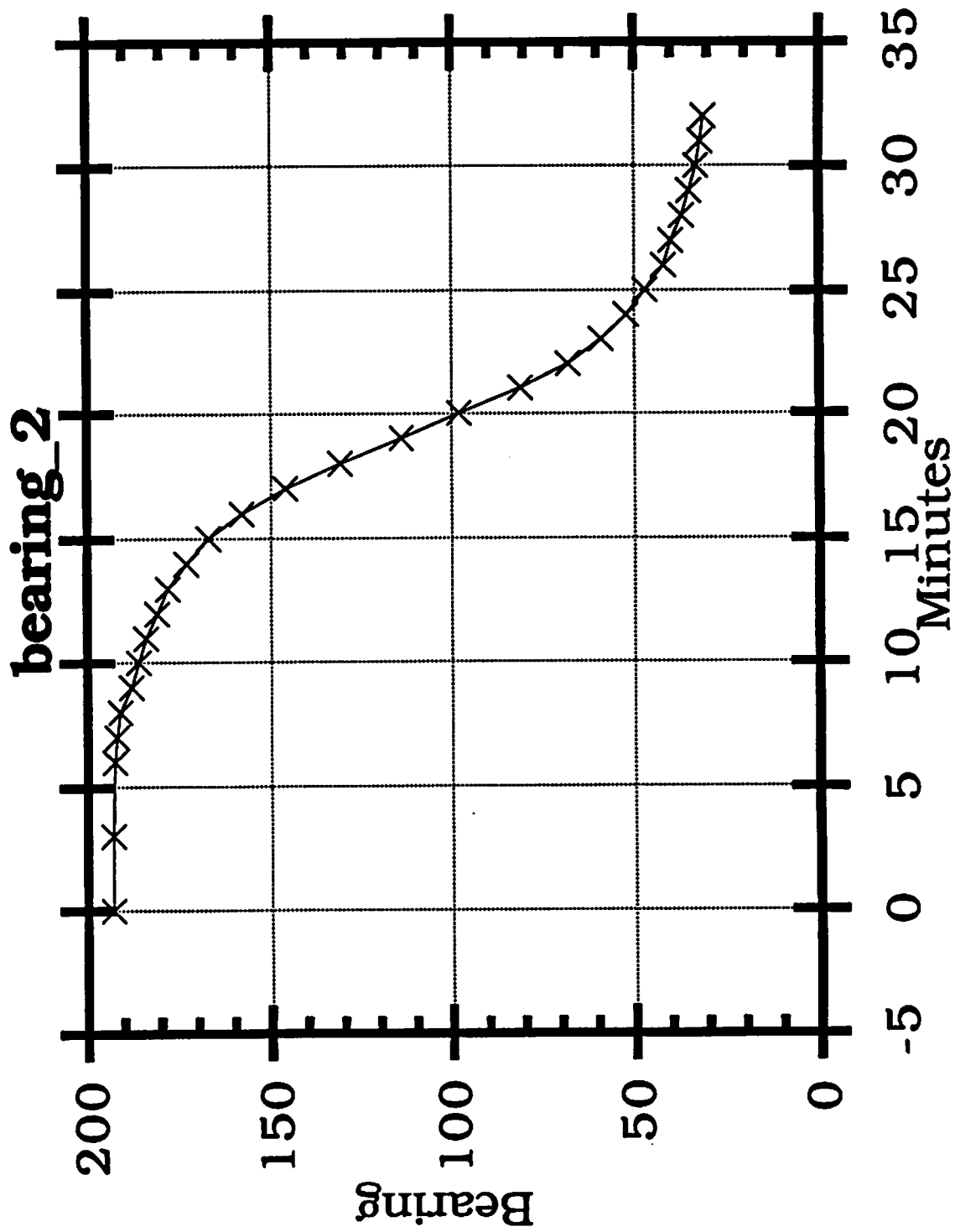


bearing_1



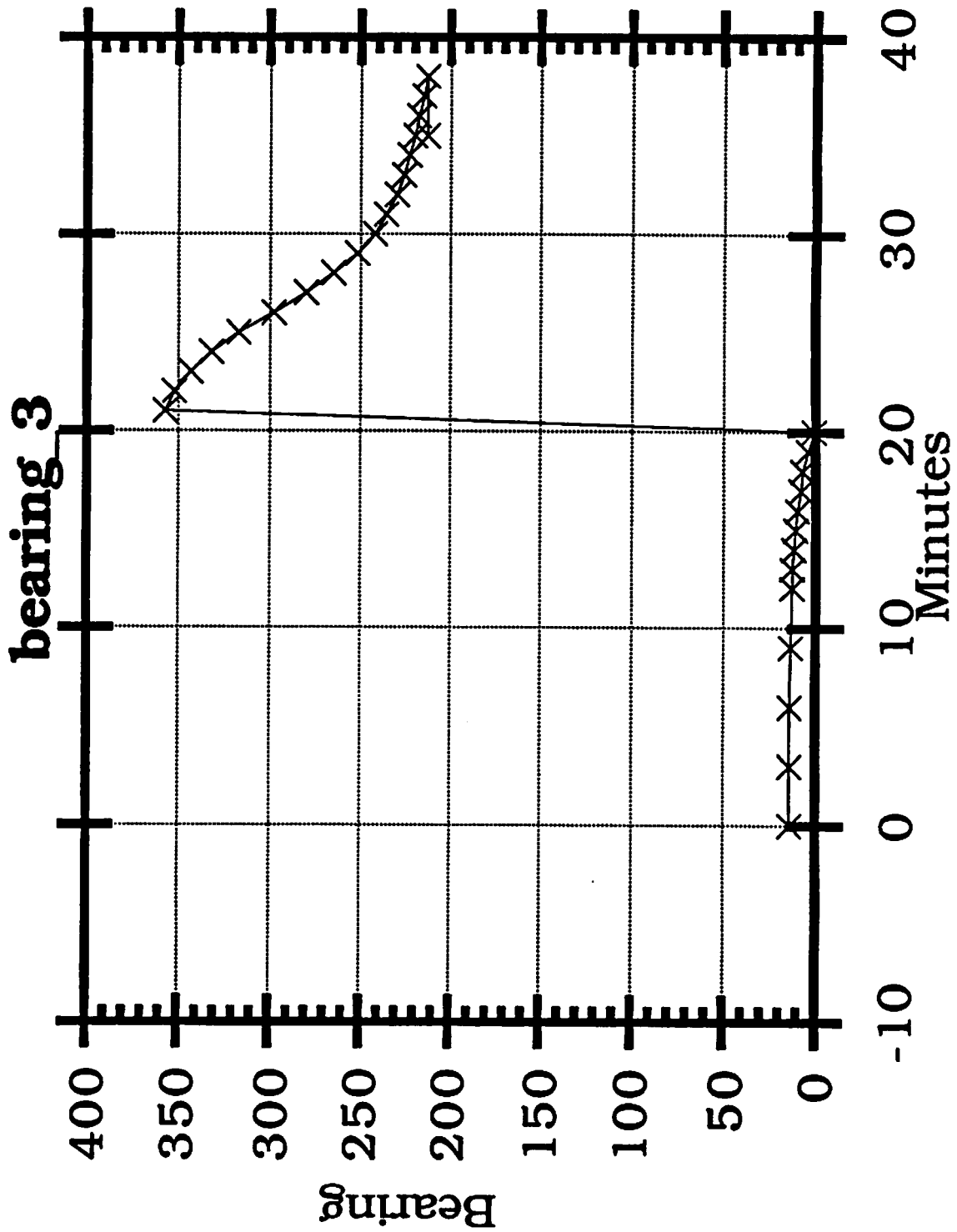
LINE
ESPI SEP 21 09Z

Line 1 Bearings	
GMT (10 Apr)	Bearing
16:43	12.5
16:44	9.5
16:45	3
16:46	350
16:47	327
16:48	299
16:49	272
16:50	254
16:51	239
16:52	230
16:53	225
16:54	220
16:55	217
16:56	214



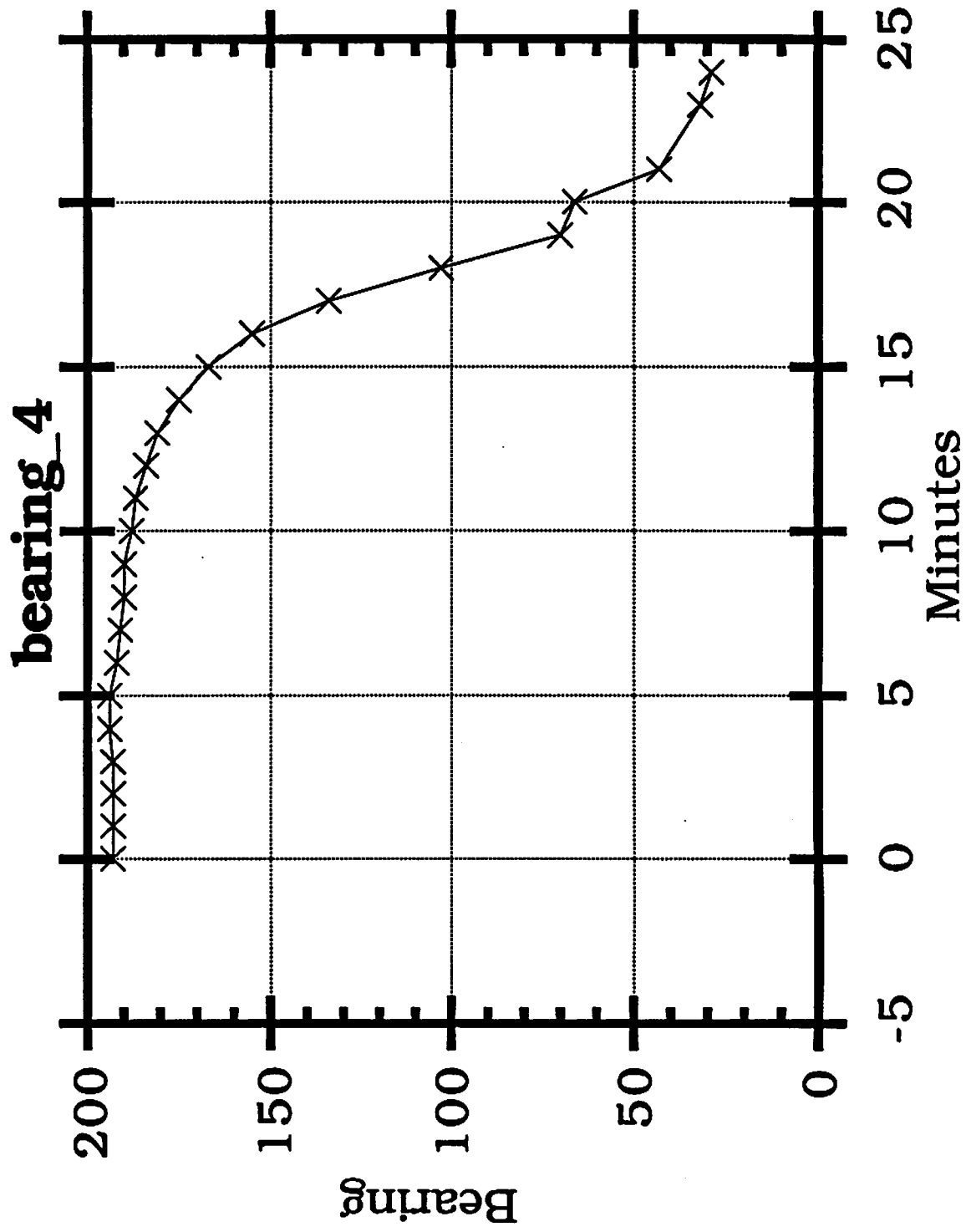
ESPL SEPR 13 LINE 1093

Line 2 Bearings	
GMT (11Apr)	Bearing
0:07	193
0:10	193
0:13	192.5
0:14	192
0:15	191
0:16	188
0:17	186
0:18	184
0:19	181
0:20	178
0:21	173
0:22	167
0:23	158
0:24	146
0:25	131
0:26	114
0:27	98
0:28	81
0:29	68
0:30	59
0:31	52
0:32	47
0:33	42
0:34	40
0:35	37
0:36	35
0:37	33
0:38	32
0:39	31



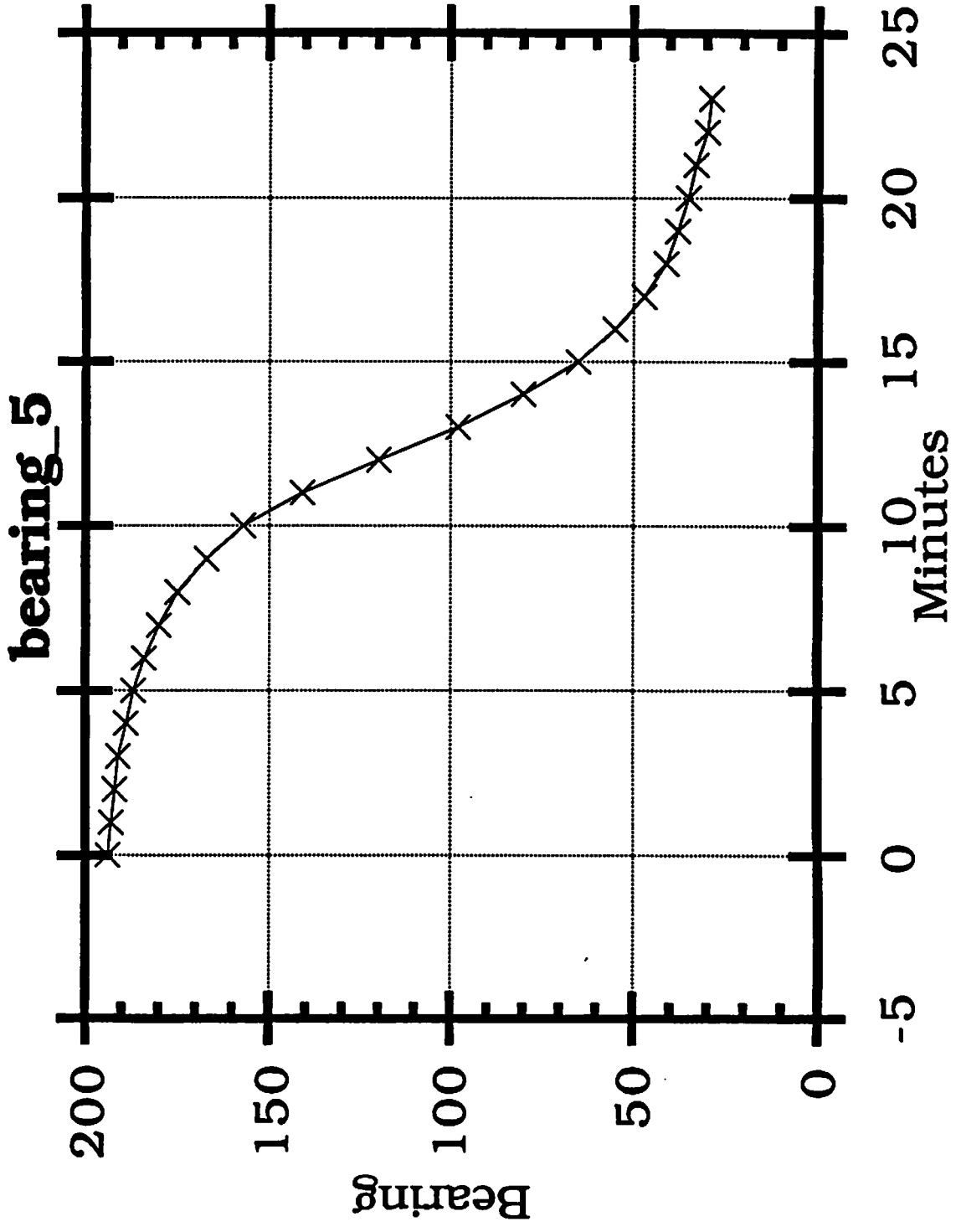
ESP 3 SEPR 14 LINE 1094

Line 3 Bearings	
GMT (11 Apr)	Bearing
6:38	14
6:41	14
6:44	14
6:47	13.5
6:50	13
6:51	13
6:52	12
6:53	11
6:54	10
6:55	8
6:56	7
6:57	4
6:58	1
6:59	357
7:00	352
7:01	343
7:02	332
7:03	317
7:04	298
7:05	280
7:06	265
7:07	252
7:08	242
7:09	236
7:10	230
7:11	226
7:12	223
7:13	220
7:14	218
7:15	215
7:16	213
7:13	213

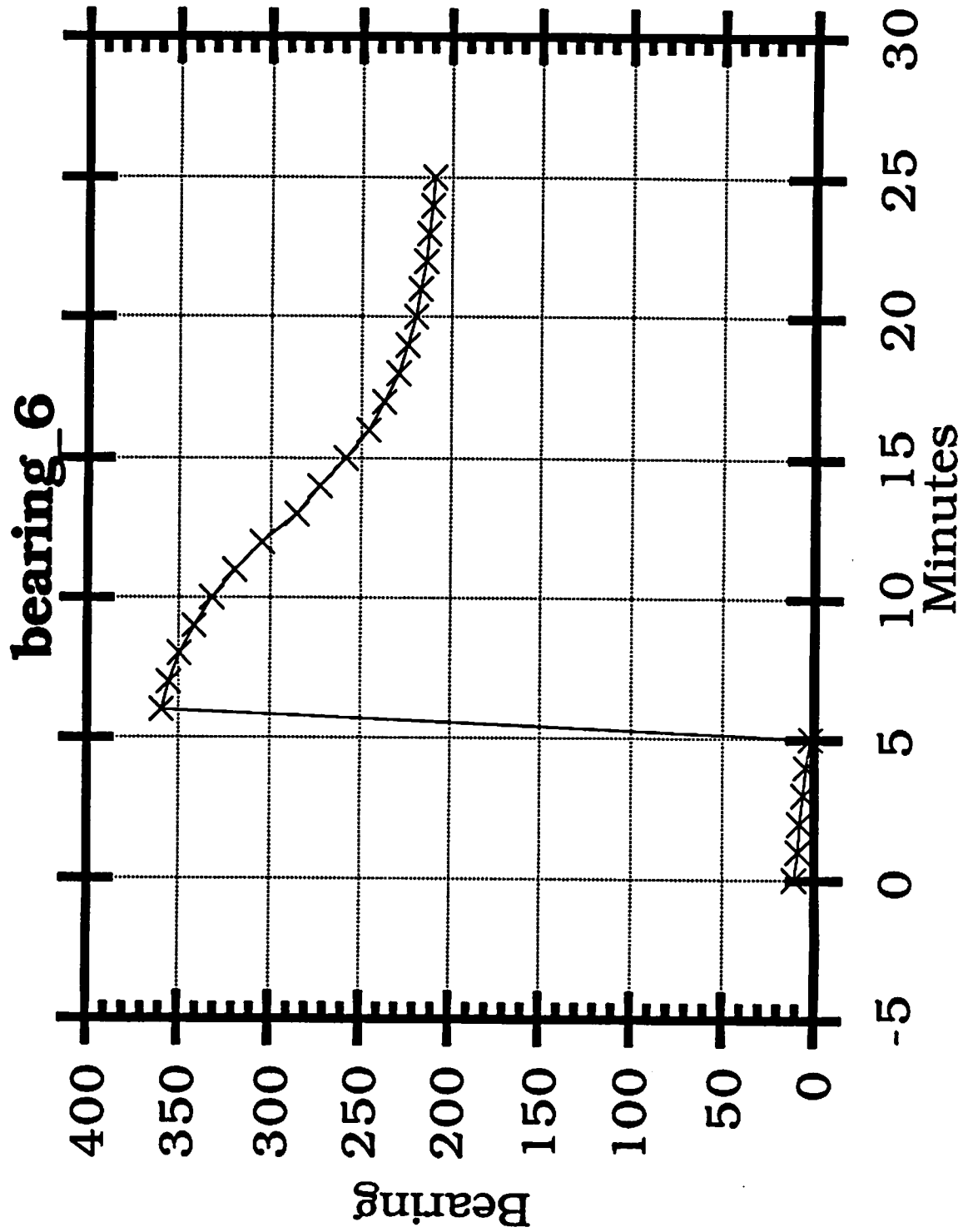


ESP4

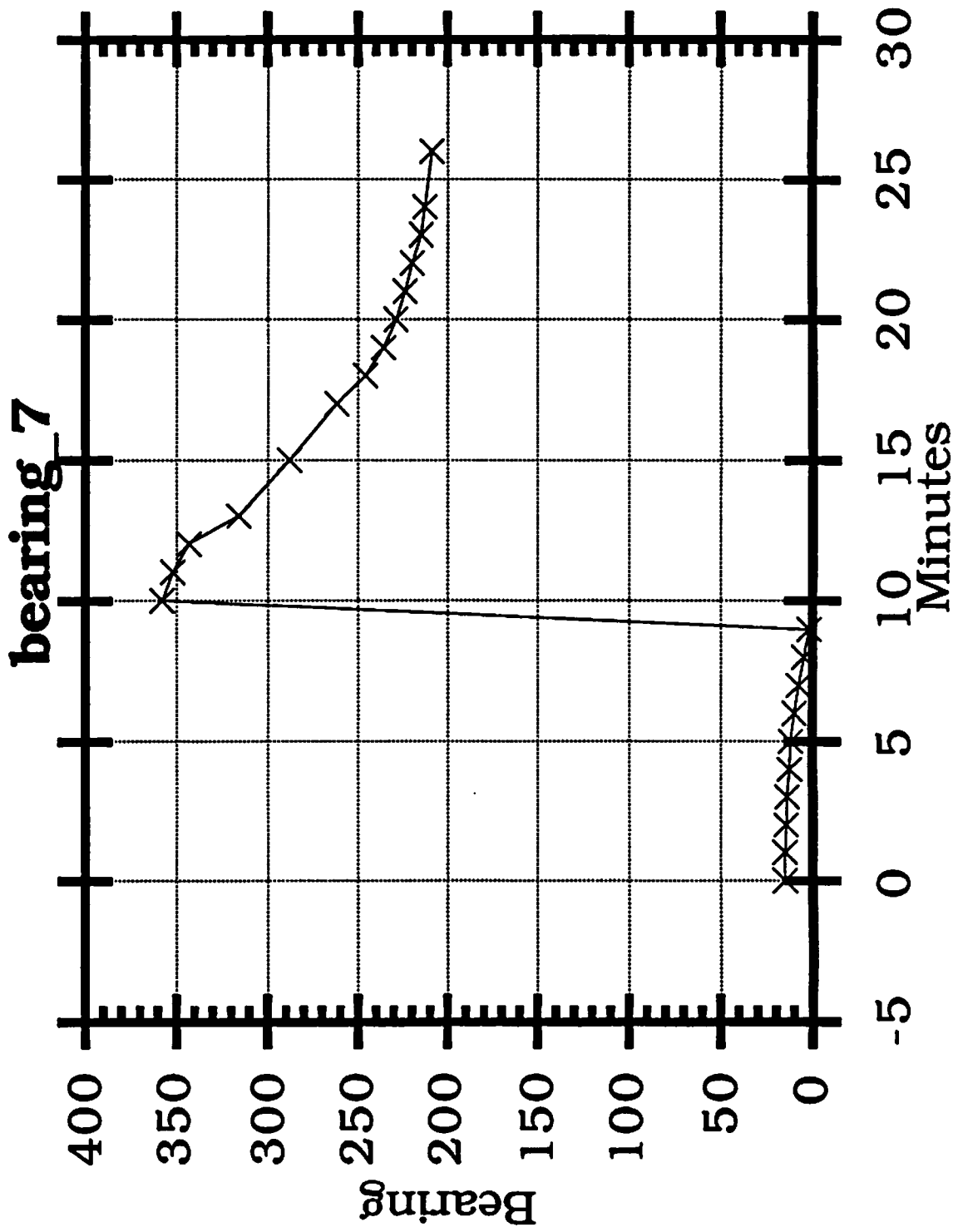
Line 4 Bearings	
GMT (11 April)	Bearings
20:08	193
20:09	193
20:10	193
20:11	193
20:12	194
20:13	194
20:14	192
20:15	191
20:16	190
20:17	190
20:18	188
20:19	187
20:20	184
20:21	181
20:22	175
20:23	167
20:24	155
20:25	134
20:26	103
20:27	70
20:28	66
20:29:14	43
20:30	
20:31:08	32
20:32:29	29
20:33	
20:34:15	25



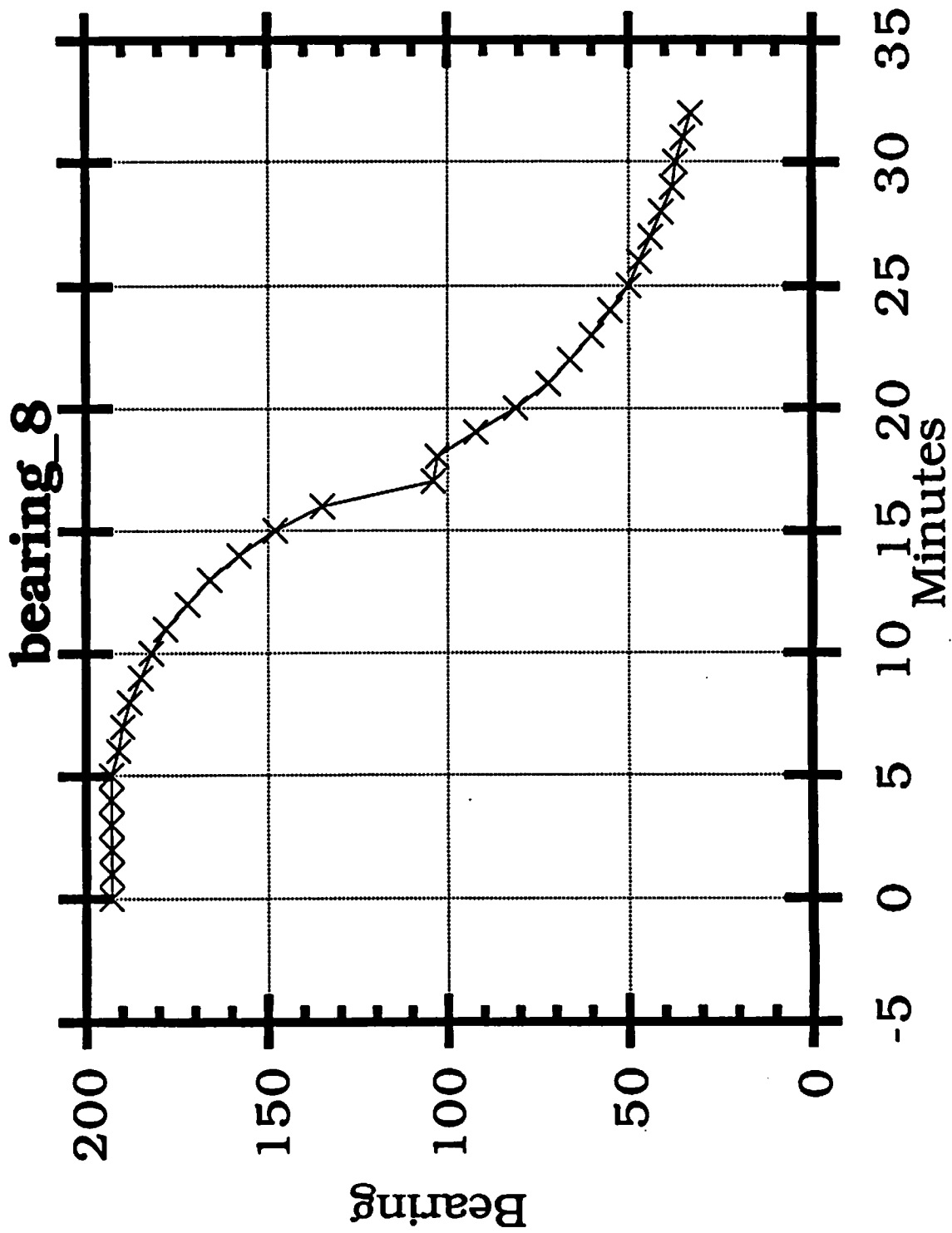
Line 5 Bearings	
GMT (11 Apr)	Bearing
15:05	194
15:06	193
15:07	192
15:08	191
15:09	189
15:10	187
15:11	184
15:12	180
15:13	175
15:14	167
15:15	157
15:16	141
15:17	120
15:18	98
15:19	80
15:20	65
15:21	55
15:22	47
15:23	41
15:24	38
15:25	35
15:26	33
15:27	30
15:28	29



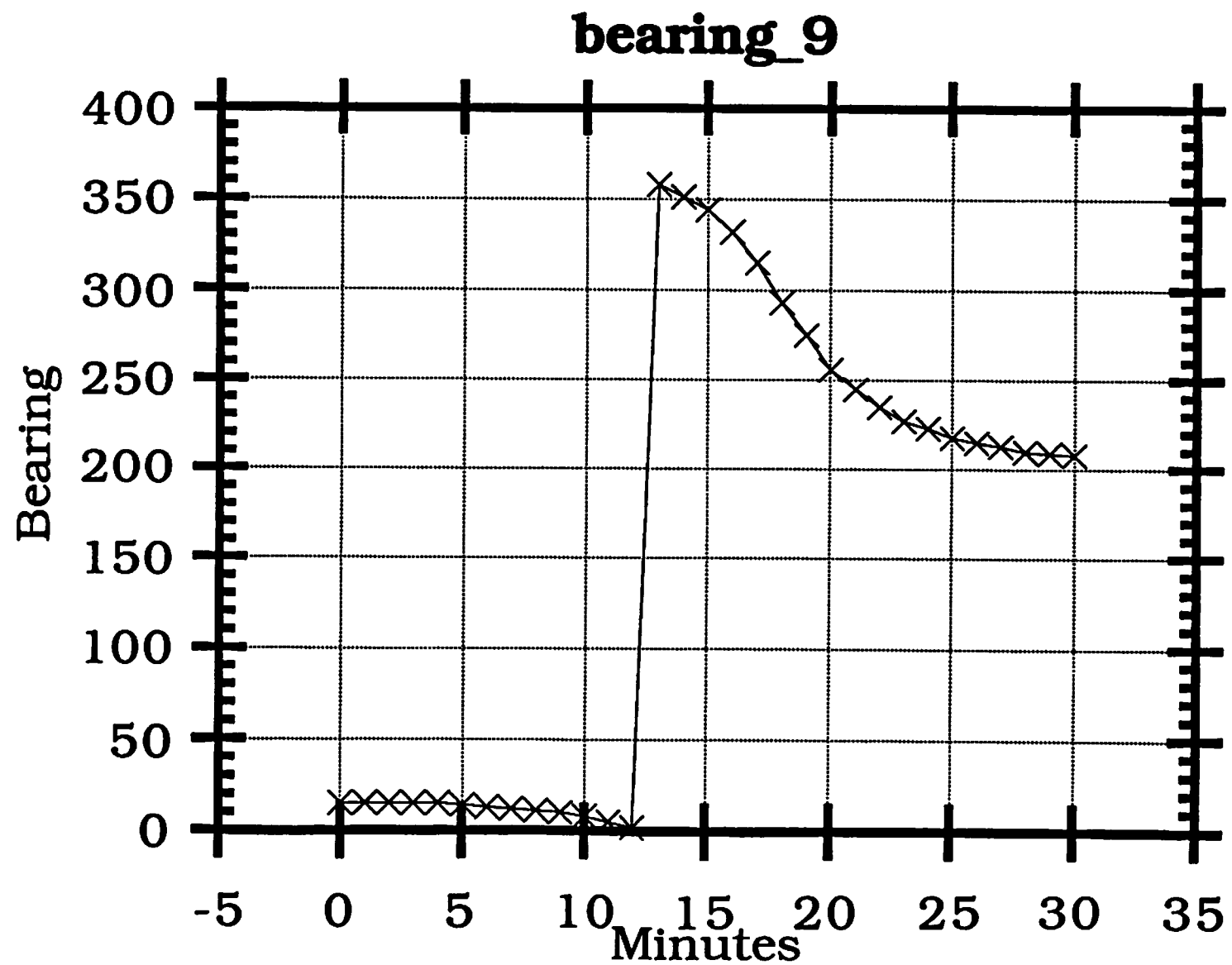
Line 6 Bearings	
GMT (11 Apr)	Bearing
18:33	11
18:34	9
18:35	8
18:36	6
18:37	4.5
18:38	2
18:39	359
18:40	355
18:41	349.5
18:42	341.5
18:43	332
18:44	319.5
18:45	304.5
18:46	285.5
18:47	273
18:48	258.5
18:49	246
18:50	237.5
18:51	229.5
18:52	224.5
18:53	220
18:54	217.5
18:55	214.5
18:56	213
18:57	211
18:58	210



Line 7 Bearings	
GMT (12 Apr)	Bearing
12:34	15
12:35	15
12:36	14.5
12:37	14
12:38	12.5
12:39	12
12:40	10
12:41	7.5
12:42	5
12:43	2
12:44	358
12:45	352
12:46	343
12:47	
12:48	316
12:49:30	288
12:50:50	262
12:52:00	246
12:53	236
12:54	229
12:55	224
12:56	220
12:57	215
12:58	213
13:00	209



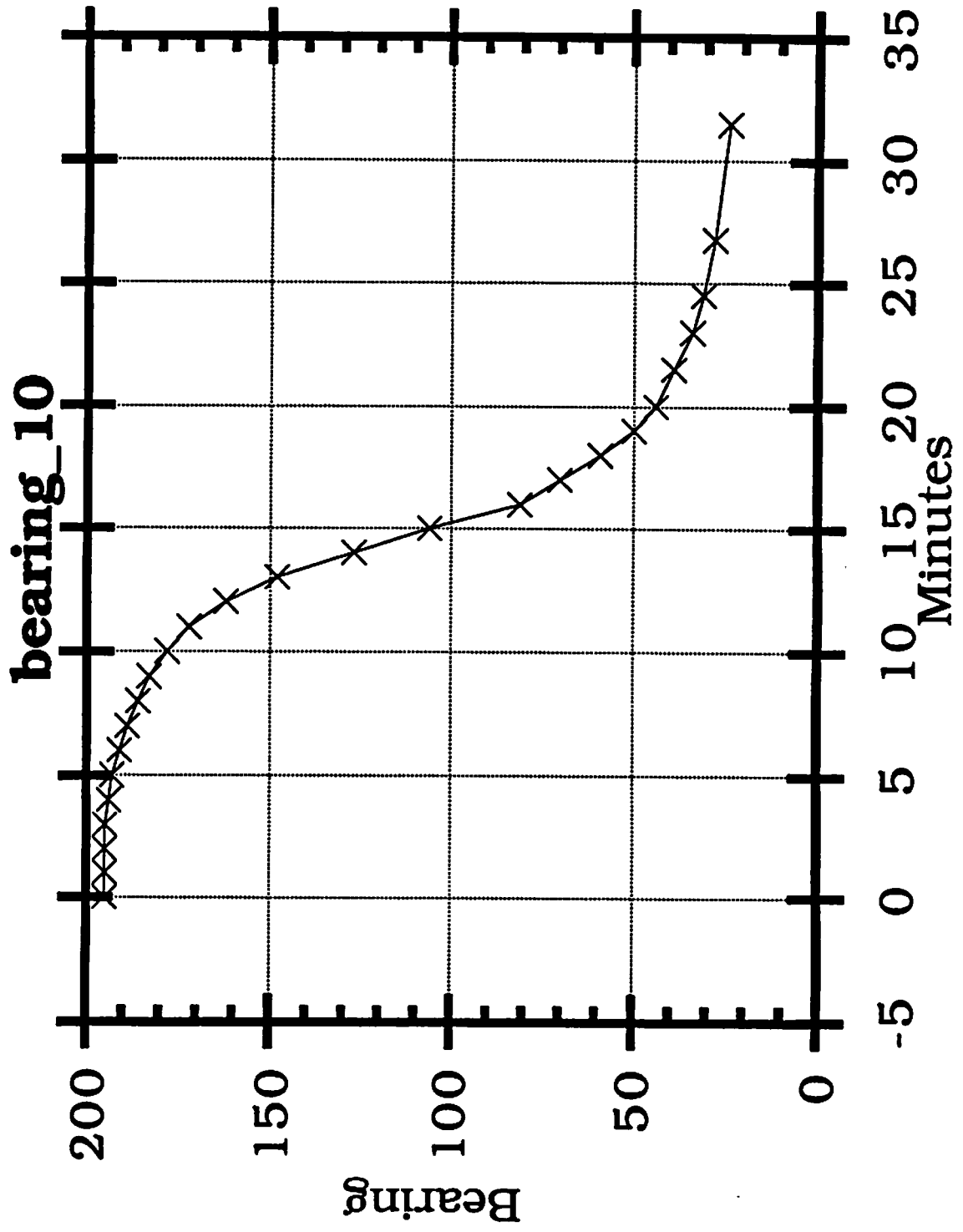
Line 8 Bearings	
GMT (12 Apr)	Bearing
21:34	193
21:35	193
21:36	193
21:37	193
21:38	193
21:39	193
21:40	191
21:41	190
21:42	188
21:43	185
21:44	182
21:45	178
21:46	172
21:47	166
21:48	158
21:49	148
21:50	135
21:51	104
21:52	103
21:53	92
21:54	81
21:55	72
21:56	66
21:57	60
21:58	55
21:59	50
22:00	47
22:01	44
22:02	41
22:03	38
22:04	37
22:05	35
22:06	33



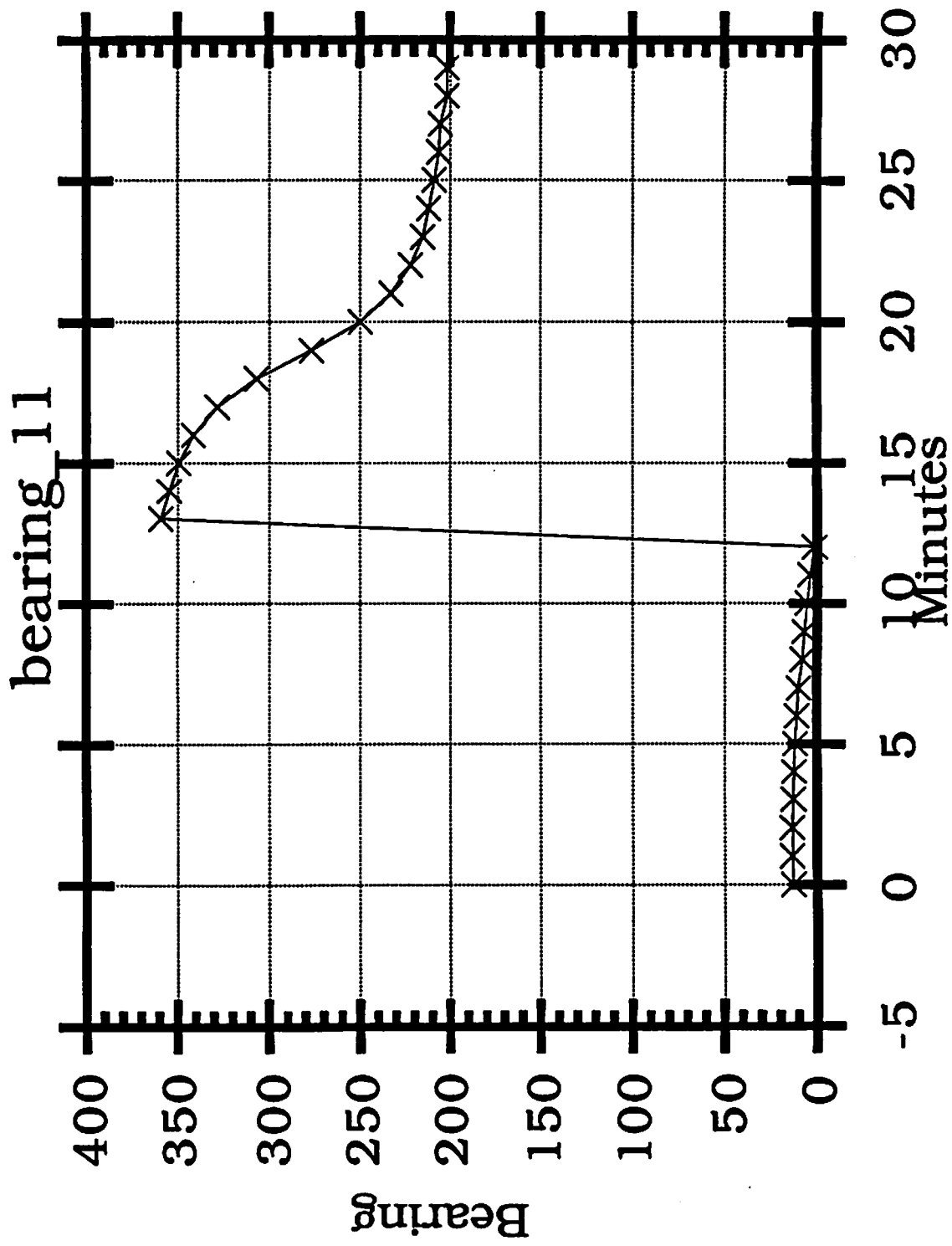
TIME 1> 0500 NDR 0100

P.D.

Line 9 Bearings	
GMT (13 Apr)	Bearing
1:00	15
1:01	15
1:02	15
1:03	15
1:04	15
1:05	14
1:06	13
1:07	12
1:08	11
1:09	10
1:10	8
1:11	5
1:12	2
1:13	358
1:14	351
1:15	344
1:16	332
1:17	315
1:18	293
1:19	275
1:20	256
1:21	245
1:22	235
1:23	227
1:24	223
1:25	218
1:26	215
1:27	213
1:28	210
1:29	209
1:30	208

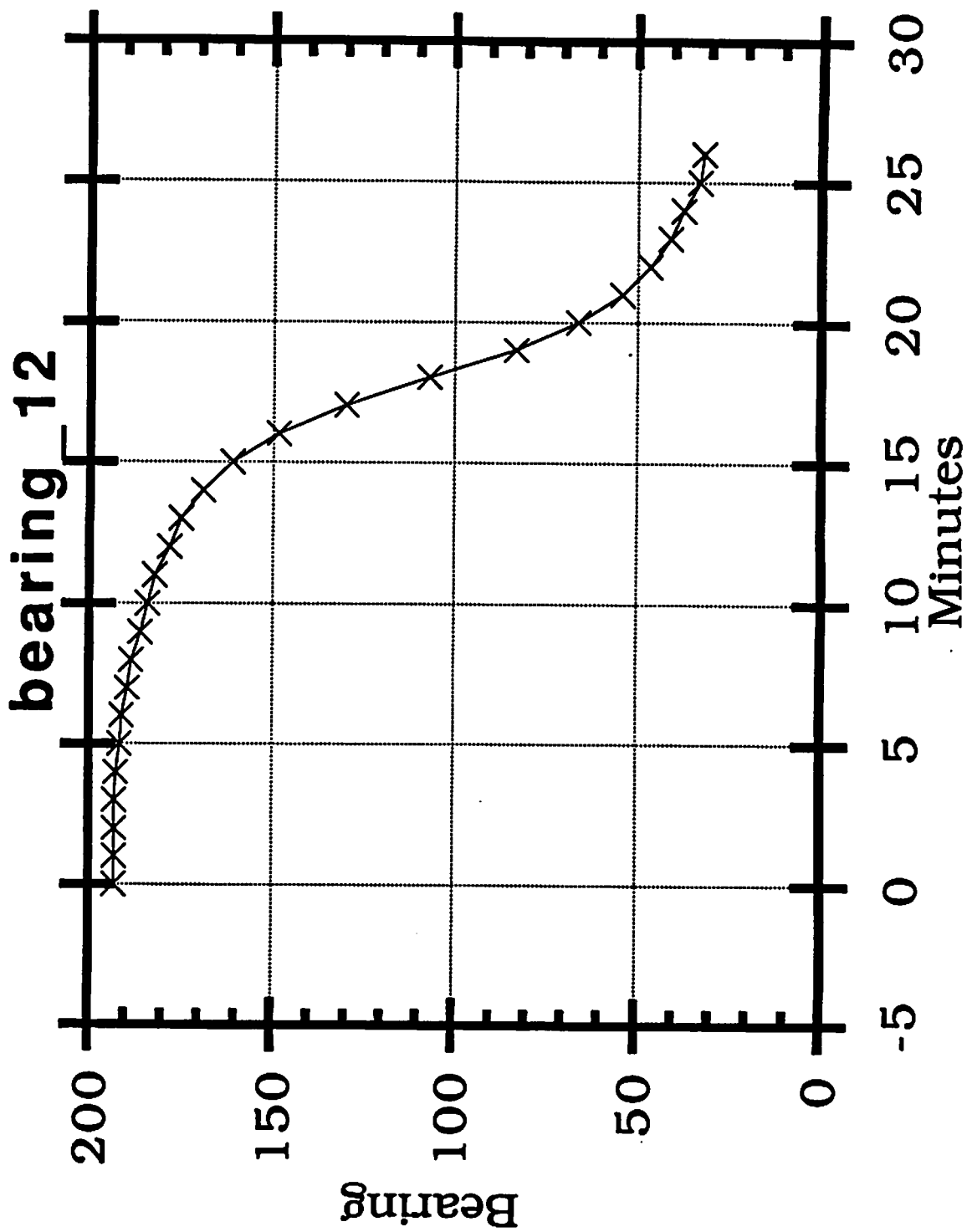


Line 10 Bearings	
GMT (13 Apr)	Bearings
13:13	195
13:14	195
13:15	195
13:16	195
13:17	194
13:18	193
13:19	191
13:20	189
13:21	186
13:22	183
13:23	178
13:24	172
13:25	162
13:26	148
13:27	127
13:28	106
13:29	81
13:30	70
13:31	59
13:32	50
13:33	44
13:34:30	39
13:36	34
13:37:30	31
13:39:45	28
13:44:30	24



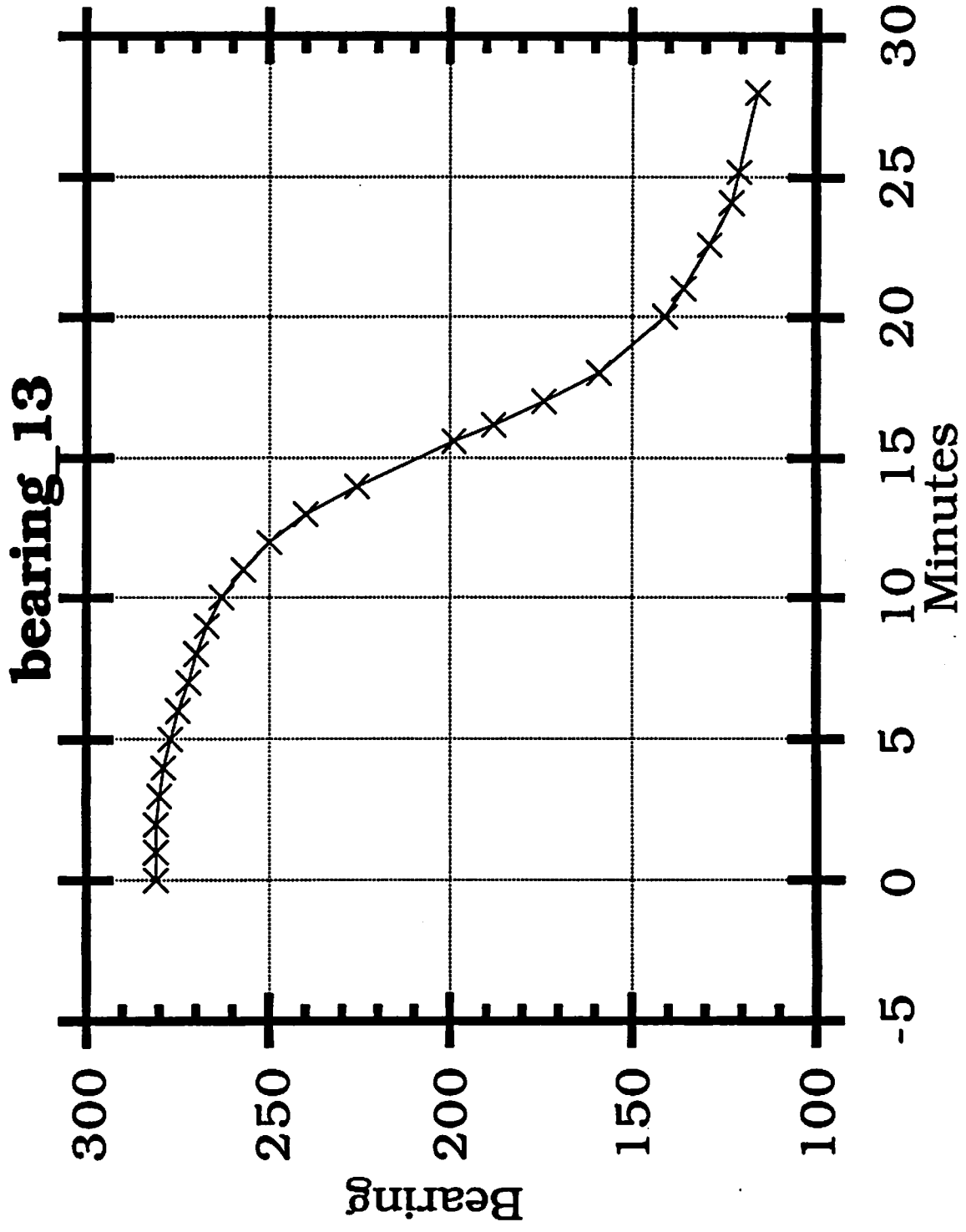
ESP 11
SUPR 22 LINE 1102

Line 11 Bearings	
GMT (13 Apr)	Bearings
22:06	13
22:07	13.5
22:08	13.5
22:09	13
22:10	12.5
22:11	12
22:12	11
22:13	10
22:14	8
22:15	7
22:16	5.5
22:17	4
22:18	1.5
22:19	359
22:20	354.5
22:21	349.5
22:22	341.5
22:23	328.5
22:24	307
22:25	277
22:26	250
22:27	233
22:28	222
22:29	215.5
22:30	212
22:31	209
22:32	206.5
22:33	205.5
22:34	202
22:35	202

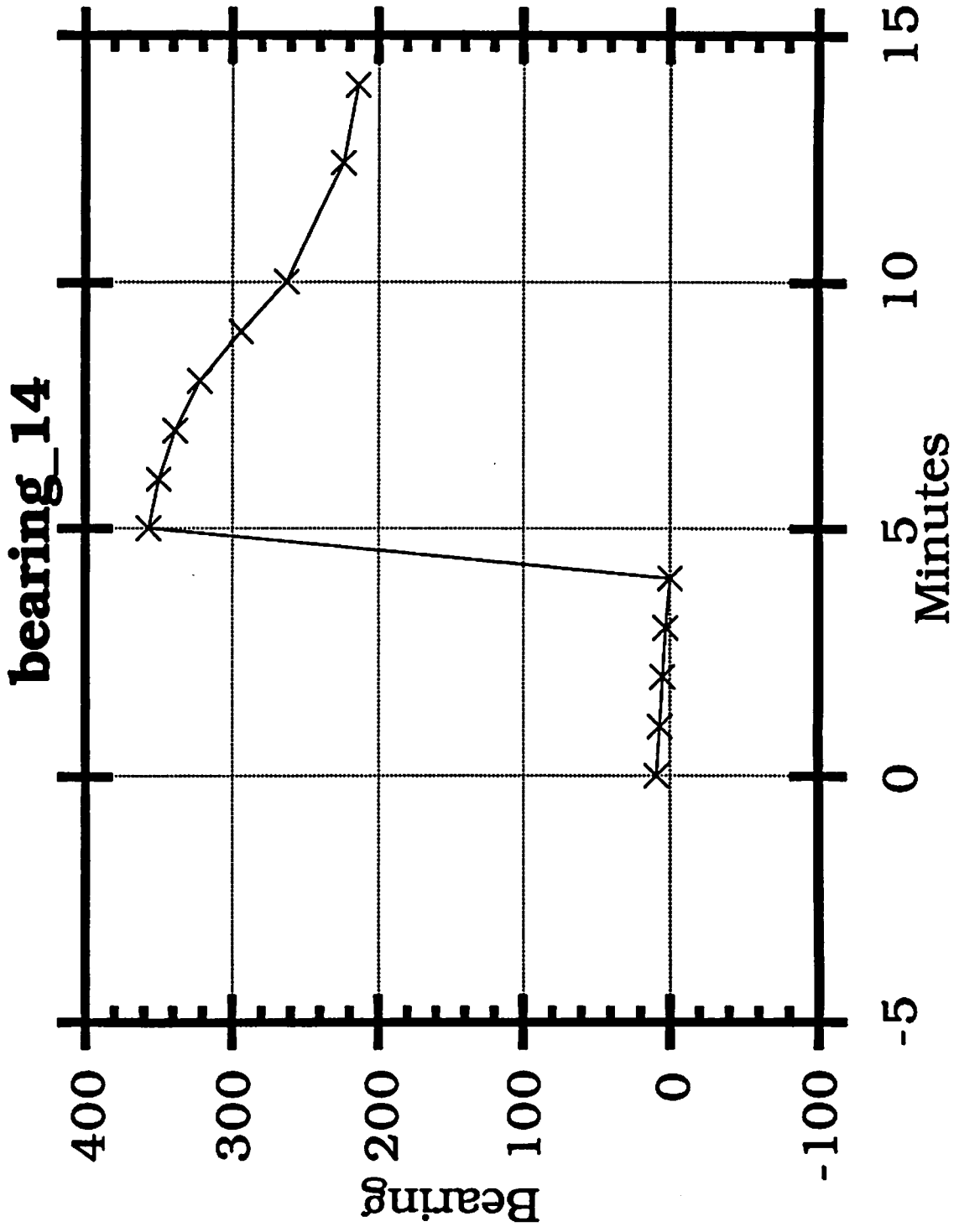


SEPR 23
ESP12 LINE 103

Line 12 Bearings	
GMT (14 April)	Bearings
2:29	193
2:30	193
2:31	193
2:32	193
2:33	192.5
2:34	191.5
2:35	191
2:36	189.5
2:37	188.5
2:38	186
2:39	184
2:40	182
2:41	178
2:42	175
2:43	169
2:44	161
2:45	148.5
2:46	130
2:47	107
2:48	83
2:49	66
2:50	54
2:51	46.5
2:52	41
2:53	37.5
2:54	33
2:55	32



Line 13 Bearings	
GMT (14 April)	Bearings
8:40	281
8:41	281
8:42	281
8:43	280
8:44	279
8:45	277
8:46	275
8:47	272
8:48	270
8:49	267
8:50	263
8:51	257
8:52	250
8:53	240
8:54	226
8:55:35	199
9:56:10	188
8:57	174
8:58	159
9:00	141
9:01	136
9:02:35	129
9:04:05	123
9:05:10	121
9:08	116



ESP 14 SEPR 25 LINE 1105

no S/H or T/m
in report

Line 14 Bearings	
GMT (14 April)	Bearings
15:41	9
15:42	7
15:43	5
15:44	3
15:45	0
15:46	357
15:47	350
15:48	339
15:49	322
15:50	294
15:51	263
15:53:25	224
15:55	214

ESP 1 Airgun Shots

15:59		16:46		17:33	
16:00		16:47		17:34	
43121-2	16:01	16:00:59	16:48	17:35	
	16:02		16:49	17:36	
	16:03		16:50	17:37	
43130-1	16:04	16:03:59	16:51	17:38	
43133-4	16:05	16:04:59	16:52	17:39	
	16:06		16:53	17:40	
	16:07		16:54	17:41	
	16:08		16:55	17:42	
	16:09		16:56	17:43	
	16:10		16:57	17:44	
	16:11		16:58	17:45	
	16:12		16:59	17:46	
	16:13		17:00	17:47	
	16:14		17:01	17:48	
	16:15		17:02	17:49	
	16:16		17:03	17:50	
	16:17		17:04	17:51	
	16:18		17:05	17:52	
	16:19		17:06	17:53	
	16:20		17:07	17:54	
	16:21		17:08	17:55	
	16:22		17:09	17:56	
	16:23		17:10	17:57	
	16:24		17:11	17:58	
	16:25		17:12	17:59	
	16:26		17:13	18:00	
	16:27		17:14	18:01	
	16:28		17:15	18:02	
	16:29		17:16	18:03	
	16:30		17:17	18:04	
	16:31		17:18	18:05	
	16:32		17:19	18:06	
	16:33	43358-9	17:20	No shot	18:07
	16:34	43361-2	17:21	No shot	18:08
	16:35	43364-5	17:22	No shot	18:09
	16:36	43367-8	17:23	No shot	18:10
	16:37		17:24		18:11
	16:38		17:25		18:12
	16:39		17:26		18:13
	16:40		17:27		18:14
	16:41		17:28		18:15
	16:42		17:29		18:16
	16:43		17:30		18:17
	16:44		17:31		18:18
	16:45		17:32		18:19

ESP 1 Airgun Shots

18:20		19:07	?	19:54	
18:21		19:08	?	19:55	
18:22		19:09	?	19:56	
18:23		19:10	?	19:57	
18:24		19:11	?	19:58	
18:25		19:12	?	19:59	
18:26		19:13	?	20:00	
18:27		19:14		43841-2 20:01	Xtra @ 01:10
18:28		19:15		20:02	
18:29		19:16		20:03	
18:30		19:17	?	20:04	
18:31		19:18	?	20:05	
18:32		19:19	?	20:06	
18:33		19:20		20:07	
18:34		19:21		20:08	
18:35		19:22		20:09	
18:36		19:23		20:10	
18:37		19:24		20:11	
18:38		19:25	?	20:12	
18:39		19:26		20:13	
18:40		19:27		20:14	
18:41		19:28			
18:42		19:29			
18:43		19:30			
18:44	?	19:31			
18:45		19:32			
18:46		19:33			
18:47		19:34			
18:48		19:35			
18:49		19:36			
18:50		19:37			
18:51		19:38			
43634-5 18:52	Xtra @ 52:27	19:39			
18:53		19:40			
18:54		19:41			
18:55		19:42			
18:56		19:43			
18:57		19:44			
18:58		19:45			
18:59		19:46			
19:00		19:47			
19:01		19:48			
19:02	?	19:49			
19:03		19:50			
19:04	?	19:51			
19:05		19:52			
19:06	?	19:53			

ESP 2 Airgun Shots

44195-6	21:59	14.5ms early	22:46		23:33
44198-9	22:00	14.5ms early	22:47		23:34
44201-2	22:01	14.5ms early	22:48		23:35
44204-5	22:02	14.5ms early	22:49		23:36
	22:03		22:50		23:37
	22:04		22:51		23:38
	22:05		22:52		23:39
	22:06		22:53		23:40
	22:07		22:54		23:41
	22:08		22:55		23:42
	22:09		22:56		23:43
	22:10		22:57		23:44
	22:11		22:58		23:45
	22:12		22:59		23:46
	22:13		23:00		23:47
	22:14		23:01		23:48
	22:15		23:02		23:49
	22:16		23:03		23:50
	22:17		23:04		23:51
	22:18		23:05		23:52
	22:19		23:06		23:53
	22:20		23:07		23:54
	22:21		23:08		23:55
	22:22		23:09		23:56
	22:23		23:10		23:57
	22:24		23:11		23:58
	22:25		23:12		23:59
	22:26		23:13		0:00
	22:27		23:14		0:01
	22:28		23:15		0:02
	22:29		23:16		0:03
	22:30		23:17		0:04
	22:31		23:18		0:05
	22:32		23:19		0:06
	22:33		23:20		0:07
	22:34		23:21		0:08
	22:35		23:22		0:09
	22:36		23:23		0:10
	22:37		23:24		0:11
	22:38		23:25		0:12
	22:39		23:26		0:13
	22:40		23:27		0:14
	22:41		23:28		0:15
	22:42		23:29		0:16
	22:43		23:30		0:17
	22:44		23:31		0:18
	22:45		23:32		0:19

ESP 2 Airgun Shots

0:20		1:07	1:54
0:21		1:08	1:55
0:22		1:09	1:56
0:23		1:10	1:57
0:24		1:11	1:58
0:25		1:12	1:59
0:26		1:13	2:00
0:27		1:14	2:01
0:28		1:15	2:02
0:29		1:16	2:03
44, 48-9 0:30	Xtra @ 30:30	1:17	2:04
0:31		1:18	2:05
0:32		1:19	2:06
0:33		1:20	2:07
0:34		1:21	2:08
0:35		1:22	2:09
0:36		1:23	2:10
0:37		1:24	2:11
0:38		1:25	2:12
0:39		1:26	2:13
0:40		1:27	2:14
0:41		1:28	2:15
0:42		1:29	2:16
0:43		1:30	2:17
0:44		1:31	2:18
0:45		1:32	2:19
0:46		1:33	2:20
0:47		1:34	2:21
0:48		1:35	2:22
0:49		1:36	2:23
0:50		1:37	2:24
0:51		1:38	2:25
0:52		1:39	2:26
0:53		1:40	2:27
0:54		1:41	2:28
0:55		1:42	2:29
0:56		1:43	2:30
0:57		1:44	2:31
0:58		1:45	2:32
0:59		1:46	2:33
1:00		1:47	2:34
1:01		1:48	2:35
1:02		1:49	2:36
1:03		1:50	2:37
1:04		1:51	2:38
1:05		1:52	2:39
1:06		1:53	2:40

ESP 2 Airgun Shots

2:41	
2:42	
2:43	
2:44	
2:45	
2:46	
2:47	
2:48	
2:49	
2:50	
2:51	
2:52	
2:53	
2:54	
2:55	
2:56	
2:57	
2:58	
2:59	
3:00	
45101-2	3:01 19.5ms late
45104-5	3:02 19.5ms late
45107-8	3:03 7ms late
45100-1	3:04 7ms late
3:05	
3:06	
3:07	
3:08	
3:09	
3:10	
3:11	
3:12	
3:13	
3:14	
3:15	
3:16	
3:17	
3:18	
3:19	
3:20	

ESP 4 Airgun Shots

1:51		2:39		3:27	
1:52		2:40		3:28	
1:53		2:41		3:29	
1:54		2:42		3:30	
1:55		2:43		3:31	
1:56		2:44		3:32	
1:57		2:45		3:33	
1:58		2:46		3:34	
1:59		2:47		3:35	
2:00		2:48		3:36	
2:01		2:49		3:37	
2:02		2:50		3:38	
2:03		2:51		3:39	
2:04		2:52		3:40	
2:05		2:53		3:41	
2:06		2:54		3:42	
2:07		2:55		3:43	
2:08		2:56		3:44	
2:09		2:57		3:45	
2:10		2:58		3:46	
2:11		2:59		3:47	
2:12		3:00		3:48	
2:13		3:01		3:49	
2:14		3:02		3:50	
2:15		3:03		3:51	
2:16		3:04		3:52	
2:17		3:05		3:53	
2:18		3:06		3:54	
2:19		3:07		3:55	
2:20		3:08		3:56	
2:21		3:09		3:57	
2:22		3:10		3:58	
2:23		3:11		3:59	
2:24		3:12		4:00	
2:25		3:13		4:01	
2:26		3:14		4:02	
2:27		3:15		4:03	
2:28		3:16		4:04	
2:29		3:17		4:05	
2:30		3:18		4:06	
2:31		3:19		4:07	
2:32		3:20		4:08	
2:33		3:21		4:09	
2:34		3:22		4:10	
2:35		3:23		4:11	
2:36		3:24		4:12	
2:37		3:25		4:13	
2:38		3:26		4:14	

ESP 4 Airgun Shots

4:15		5:03		5:51	
4:16		5:04		5:52	
4:17		5:05		5:53	
4:18		5:06		5:54	
4:19		5:07		5:55	
4:20		5:08		5:56	
4:21		5:09		5:57	
4:22		49777-8 5:10	5ms late	5:58	
4:23		49780-1 5:11	5ms late	5:59	
49639-40 4:24	5ms late	49783-4 5:12	5ms late	6:00	
42-43 4:25	5ms late	5:13		6:01	
4:26		5:14		6:02	
4:27		5:15		6:03	weak
4:28		5:16		6:04	weak
4:29		5:17		6:05	weak
4:30		5:18		6:06	weak
4:31		5:19		6:07	weak
4:32		5:20		6:08	
4:33		5:21		6:09	
4:34		49813-4 5:22	5ms late	6:10	
4:35		49816-7 5:23	5ms late	6:11	
4:36		49819-20 5:24	5ms late	6:12	
4:37		5:25		6:13	
4:38		5:26		6:14	
4:39		5:27		6:15	
4:40		5:28		6:16	
4:41		5:29		6:17	
4:42		5:30		49981-2 6:18	5ms late
4:43		5:31		49984-5 6:19	5ms late
4:44		5:32		6:20	
4:45		5:33		6:21	
4:46	Xtra @ 46:49	5:34		6:22	
49709-9 4:47	5ms late	5:35		6:23	
49711-2 4:48	5ms late	5:36		6:24	
4:49		5:37		6:25	
4:50		5:38		6:26	
4:51		5:39		6:27	
4:52		5:40		6:28	
4:53		5:41		6:29	
4:54		5:42		6:30	
4:55		5:43		6:31	
4:56		5:44		50023-4 6:32	7.5ms late
4:57		5:45		50026-7 6:33	7.5ms late
4:58		5:46		6:34	
4:59		5:47		6:35	
5:00		5:48		6:36	
5:01		5:49		6:37	
5:02		5:50		6:38	

ESP 4 Airgun Shots

	6:39	
	6:40	
	6:41	
	6:42	
50056-7	6:43	5ms late
50059-60	6:44	5ms late
50062-3	6:45	2.5ms late
50065-6	6:46	2.5ms late
	6:47	
	6:48	
	6:49	
	6:50	
	6:51	
	6:52	
	6:53	
	6:54	
	6:55	
	6:56	
	6:57	
	6:58	
	6:59	
50107-8	7:00	5ms late
50110-1	7:01	5ms late
	7:02	
	7:03	
	7:04	
	7:05	
	7:06	
	7:07	
	7:08	
	7:09	
	7:10	
	7:11	
	7:12	
	7:13	
	7:14	
	7:15	5ms late
	7:16	5ms late
	7:17	
	7:18	
	7:19	
	7:20	
	7:21	

EOL

ESP 5 Airgun Shots

14:22		15:10		15:58	
14:23		15:11		15:59	
14:24		15:12		16:00	
14:25		15:13		16:01	
14:26		15:14		16:02	
14:27		15:15		16:03	
14:28		15:16		16:04	
14:29		15:17		16:05	
14:30		15:18		16:06	
47140-14:31	No shot	15:19		16:07	
47143-14:32	5ms late	15:20		16:08	
47146-14:33	5ms late	15:21		16:09	
14:34		15:22		16:10	
14:35		15:23		16:11	
14:36		15:24		16:12	
14:37		15:25		16:13	
14:38		15:26		16:14	
14:39		15:27		16:15	
14:40		15:28		16:16	
14:41		15:29		16:17	
14:42		15:30		16:18	
14:43		15:31		16:19	
14:44		15:32		16:20	
14:45		15:33		16:21	
14:46		15:34		16:22	
14:47		15:35		16:23	
14:48		15:36		16:24	
14:49		15:37		16:25	
14:50		15:38		16:26	
14:51		15:39		16:27	
14:52		15:40		16:28	
14:53		15:41		16:29	
14:54		15:42		16:30	
14:55		15:43		16:31	
14:56		15:44		16:32	
14:57		47362-15:45	20ms late	16:33	
14:58		47365-6 15:46	5ms late	16:34	
14:59		47368-9 15:47	5ms late	16:35	
15:00		15:48		16:36	
15:01		15:49		16:37	
15:02		15:50		16:38	
15:03		15:51		16:39	
15:04		15:52		16:40	
15:05		15:53		16:41	
15:06		15:54		16:42	
15:07		15:55		16:43	
15:08		15:56		16:44	
15:09		15:57		16:45	

ESP 5 Airgun Shots

16:46		17:34	
16:47		17:35	
16:48		17:36	
16:49		17:37	
16:50			
16:51			
16:52			
16:53			
16:54			
16:55			
16:56			
16:57			
16:58			
16:59			
17:00			
17:01			
17:02			
17:03			
17:04			
17:05			
17:06			
17:07			
17:08			
17:09			
17:10			
17:11			
17:12			
17:13			
17:14			
17:15			
17:16			
17:17			
17:18			
17:19			
17:20			
17:21			
17:22			
17:23			
17:24			
17:25			
17:26			
17:27			
17:28			
17:29			
17:30			
17:31			
17:32			
17:33			

ESP 6 Airgun Shots

47988-7	19:14	5ms late	20:02	20:50	
47991-2	19:15	5ms late	20:03	20:51	
	19:16		20:04	20:52	
	19:17		20:05	20:53	
	19:18		20:06	20:54	
	19:19		20:07	20:55	Xtra @ 55:09
	19:20		20:08	20:56	
	19:21		20:09	20:57	
	19:22		20:10	20:58	
	19:23		20:11	20:59	
	19:24		20:12	21:00	
	19:25		20:13	21:01	
	19:26		20:14	21:02	
	19:27		20:15	21:03	
	19:28		20:16	21:04	
	19:29		20:17	21:05	
	19:30		20:18	21:06	
	19:31		20:19	21:07	
	19:32		20:20	21:08	
	19:33		20:21	21:09	
	19:34		20:22	21:10	
	19:35		20:23	21:11	
	19:36		20:24	21:12	
	19:37		20:25	21:13	
	19:38		20:26	21:14	
	19:39		20:27	21:15	
	19:40		20:28	21:16	
	19:41		20:29	21:17	
	19:42		20:30	21:18	
	19:43		20:31	21:19	
	19:44		20:32	21:20	
	19:45		20:33	21:21	
	19:46		20:34	21:22	
	19:47		20:35	21:23	
	19:48		20:36	21:24	
	19:49		20:37	21:25	
	19:50		20:38	21:26	
	19:51		20:39	21:27	
	19:52		20:40	21:28	
	19:53		20:41	21:29	
	19:54		20:42	21:30	
	19:55		20:43	21:31	
	19:56		20:44	21:32	
	19:57		20:45	21:33	
	19:58		20:46	21:34	
	19:59		20:47	21:35	
	20:00		20:48	21:36	
	20:01		20:49	21:37	

ESP 6 Airgun Shots

20:38		21:26		48528-9 22:14	22:13:35
20:39		21:27		48531-2 22:15	22:14:35
20:40		21:28		48534-5 22:16	22:15:35
20:41		21:29			22:17
20:42		21:30			22:18
20:43		21:31			22:19
20:44		21:32			22:20
20:45		21:33			22:21
20:46		21:34			22:22
20:47		21:35			22:23
20:48		21:36			22:24
20:49		21:37			22:25
20:50		21:38			22:26
20:51		21:39			22:27
20:52		21:40			22:28
20:53		21:41			22:29
20:54		21:42			22:30
20:55		21:43			22:31
20:56		21:44			22:32
20:57		21:45			22:33
20:58		21:46			22:34
20:59		21:47			22:35
21:00		21:48			22:36
21:01		21:49			22:37
21:02		21:50			22:38
21:03		21:51			22:39
21:04		21:52			22:40
21:05		21:53			22:41
21:06		21:54			22:42
21:07		21:55			22:43
21:08		21:56			22:44
21:09		21:57			22:45
21:10		21:58			22:46
21:11		21:59			22:47
21:12		22:00			22:48
21:13		22:01			22:49
21:14		48492-3 22:02	22:01:56		22:50
21:15		48505-6 22:03	No Shot		22:51
21:16		48508-9 22:04	22:03:51		22:52
21:17		48501-2 22:05	22:04:51		22:53
21:18		48504-5 22:06	22:05:51		22:54
21:19		48507-8 22:07	22:06:51		22:55
21:20		48510-1 22:08	22:07:50		22:56
21:21		48513-4 22:09	No Shot		22:57
21:22		48516-7 22:10	22:09:43		22:58
21:23		48519-20 22:11	22:10:43		22:59
21:24		48522-3 22:12	22:11:35		23:00
21:25		48525-6 22:13	22:12:35		23:01

ESP 6 Airgun Shots

23:02		23:50	
23:03		23:51	
23:04		23:52	
23:05		23:53	
23:06		23:54	
23:07		23:55	
23:08		23:56	
23:09		23:57	
23:10		23:58	
23:11		23:59	
23:12		0:00	
23:13		0:01	
23:14		0:02	
23:15		0:03	
23:16		0:04	
23:17		0:05	
23:18		0:06	
23:19		0:07	
23:20		0:08	
23:21		0:09	
23:22		0:10	
23:23		0:11	
23:24		0:12	
23:25		0:13	
23:26		0:14	
23:27		0:15	
23:28		0:16	
23:29		0:17	
23:30		0:18	
23:31		0:19	
23:32		0:20	
23:33		0:21	
23:34		0:22	
23:35		0:23	
23:36		0:24	
23:37		0:25	
23:38		0:26	
23:39		0:27	
23:40		0:28	
23:41		0:29	
23:42		0:30	
23:43		0:31	
23:44		0:32	
23:45		0:33	
23:46			
23:47			
23:48			
23:49			

ESP 7 Airgun Shots

50566-7	9:33	2.5ms late	10:21		11:09	No Shot
50569-70	9:34	2.5ms late	10:22		11:10	No Shot
	9:35		10:23		11:11	No Shot
	9:36		10:24		11:12	
	9:37		10:25		11:13	
	9:38		10:26		11:14	
	9:39		10:27		11:15	
50587-8	9:40	5ms late	10:28		11:16	
50590-1	9:41	5ms late	10:29		50878-9 11:17	5ms late
50593-4	9:42	5ms late	10:30		81-82 11:18	5ms late
	9:43		10:31		11:19	
	9:44		10:32		11:20	
	9:45		10:33		11:21	
	9:46		10:34		11:22	
	9:47		10:35		11:23	
	9:48		10:36		11:24	
	9:49		10:37		11:25	
	9:50		10:38		50905-6 11:26	5ms late
	9:51		10:39		50908-9 11:27	5ms late
	9:52		10:40		50911-2 11:28	2.5ms late
	9:53		10:41		11:29	
	9:54		10:42		11:30	
	9:55		50776-7 10:43	5ms late	11:31	
50635-6	9:56	5ms late	50779-80 10:44	5ms late	11:32	
8-9	9:57	5ms late	507782-3 10:45	2.5ms late	11:33	
41-2	9:58	5ms late	10:46		50929-30 11:34	No Shot
	9:59		10:47		11:35	
	10:00		10:48		11:36	
	10:01		10:49		11:37	
	10:02		10:50		11:38	
	10:03		10:51		11:39	
	10:04		10:52		11:40	
	10:05		10:53		11:41	
	10:06		10:54		50453-4 11:42	5ms late
	10:07		10:55		6-7 11:43	5ms late
	10:08		50815-6 10:56	5ms late	11:44	
	10:09		50818-9 10:57	5ms late	11:45	
	10:10		10:58		11:46	
50680-1	10:11	5ms late	10:59		11:47	
3-4	10:12	5ms late	11:00		11:48	
	10:13		11:01		11:49	
	10:14		11:02		11:50	
	10:15		11:03		11:51	
	10:16		11:04		11:52	
	10:17		11:05		11:53	
	10:18		11:06		11:54	
	10:19		11:07	No Shot	11:55	
	10:20		11:08	No Shot	11:56	

ESP 7 Airgun Shots

11:57		12:45		51286-7 13:33	2.5ms early
11:58		12:46		9-90 13:34	2.5ms early
11:59		12:47		13:35	
12:00		12:48		13:36	
12:01		12:49		51298-9 13:37	No Shot
12:02		12:50		13:38	No Shot
12:03		12:51		13:39	No Shot
12:04		12:52		13:40	No Shot
12:05		12:53		13:41	No Record
12:06		12:54		13:42	No Record
12:07		12:55		13:43	No Record
12:08		12:56		13:44	No Record
12:09		12:57		13:45	No Record
12:10		51181-2 12:58	5ms late	13:46	No Record
12:11		4-5 12:59	5ms late	13:47	No Record
12:12		13:00		13:48	No Record
12:13		13:01		13:49	No Record
12:14		13:02		13:50	No Record
51052-3 12:15	No Shot	13:03		13:51	No Record
5-6 12:16	5ms late	13:04		51343-4 13:52	No Record
12:17		13:05		51346-7 13:53	10ms late
12:18		13:06		9-50 13:54	10ms late
12:19		13:07		51352-3 13:55	2.5ms early
12:20		13:08		13:56	
12:21		51214-5 13:09	5ms late	13:57	
12:22		7-8 13:10	5ms late	13:58	
12:23		13:11		13:59	
51079-80 12:24	No Shot	13:12		14:00	
51082-3 12:25	10ms late	13:13		14:01	
51085-6 12:26	10ms late	13:14		14:02	
12:27		13:15		14:03	
12:28		13:16		51379-80 14:04	5ms late
12:29		51238-9 13:17	No Record	51381-3 14:05	5ms late
12:30		13:18	No Record	14:06	
12:31		13:19	No Record	14:07	
12:32		13:20	No Record	14:08	
12:33		13:21	No Record	14:09	
12:34		13:22	No Record	14:10	
12:35		51256-7 13:23	No Record	14:11	
12:36		13:24		14:12	
12:37		13:25		14:13	
12:38		51265-6 13:26	No Shot	14:14	
12:39		13:27	No Shot		
12:40		13:28	No Record		
12:41		13:29	No Record		
12:42		13:30	No Shot		
12:43		51280-1 13:31	No Shot		
12:44		13:32			

ESP 8 Airgun Shots

52228-9	18:47	11ms late	19:35	20:23
	18:48		19:36	20:24
52234-5	18:49	2.5ms early	19:37	20:25
	18:50		19:38	20:26
	18:51		19:39	20:27
52243-4	18:52	No Shot	19:40	20:28
	18:53		19:41	20:29
	18:54		19:42	20:30
	18:55		19:43	20:31
	18:56		19:44	20:32
	18:57		19:45	20:33
	18:58		19:46	20:34
	18:59		19:47	20:35
	19:00		19:48	20:36
	19:01		19:49	20:37
	19:02		19:50	20:38
	19:03		19:51	20:39
	19:04		19:52	20:40
	19:05		19:53	20:41
	19:06		19:54	20:42
	19:07		19:55	20:43
	19:08		19:56	20:44
	19:09		19:57	20:45
	19:10		19:58	20:46
	19:11		19:59	20:47
	19:12		20:00	20:48
	19:13		20:01	20:49
	19:14		20:02	20:50
	19:15		20:03	20:51
	19:16		20:04	20:52
	19:17		20:05	20:53
	19:18		20:06	20:54
	19:19		20:07	20:55
	19:20		20:08	20:56
	19:21		20:09	20:57
	19:22		20:10	20:58
	19:23		20:11	20:59
	19:24		20:12	21:00
	19:25		20:13	21:01
	19:26		20:14	21:02
	19:27		20:15	21:03
	19:28		20:16	21:04
	19:29		20:17	21:05
	19:30		20:18	21:06
	19:31		20:19	21:07
	19:32		20:20	21:08
	19:33		20:21	21:09
	19:34		20:22	21:10

ESP 8 Airgun Shots

23:35	
23:36	
23:37	
23:38	
23:39	
23:40	
23:41	
23:42	
23:43	
23:44	
23:45	
23:46	
23:47	
23:48	
23:49	
23:50	
23:51	
23:52	
23:53	
23:54	
23:55	
23:56	
23:57	
23:58	
23:59	
0:00	
0:01	

ESP 9 Airgun Shots

45-6 5954-3	2:06	4ms late	2:54	3:42
8-9 5-6	2:07	4ms late	2:55	3:43
	2:08		2:56	3:44
	2:09		2:57	3:45
	2:10		2:58	3:46
	2:11		2:59	3:47
6-7	2:12		3:00	3:48
5356 7-4	2:13	1 s late	3:01	3:49
	2:14		3:02	3:50
	2:15		3:03	3:51
	2:16		3:04	3:52
	2:17		3:05	3:53
	2:18		3:06	3:54
	2:19		3:07	3:55
	2:20		3:08	3:56
	2:21		3:09	3:57
	2:22		3:10	3:58
	2:23		3:11	3:59
	2:24		3:12	4:00
	2:25		3:13	4:01
	2:26		3:14	4:02
	2:27		3:15	4:03
	2:28		3:16	4:04
	2:29		3:17	4:05
	2:30		3:18	4:06
	2:31		3:19	4:07
	2:32		3:20	4:08
	2:33		3:21	4:09
	2:34		3:22	4:10
	2:35		3:23	4:11
	2:36		3:24	4:12
	2:37		3:25	4:13
	2:38		3:26	4:14
	2:39		3:27	4:15
	2:40		3:28	4:16
	2:41		3:29	4:17
	2:42		3:30	4:18
	2:43		3:31	4:19
	2:44		3:32	4:20
	2:45		3:33	4:21
	2:46		3:34	4:22
	2:47		3:35	4:23
	2:48		3:36	4:24
	2:49		3:37	4:25
	2:50		3:38	4:26
	2:51		3:39	4:27
	2:52		3:40	4:28
	2:53		3:41	4:29

ESP 9 Airgun Shots

4:30		5:18		6:06	
4:31		5:19		6:07	
4:32		5:20		6:08	
4:33		5:21		6:09	
4:34		5:22		6:10	
4:35		5:23		6:11	
4:36		5:24		6:12	
4:37		5:25		6:13	
4:38		5:26		6:14	
4:39		5:27		6:15	
4:40		5:28		6:16	
4:41		5:29		6:17	
4:42		5:30		6:18	
4:43	60-61 54157-8	5:31	Xtra @ 31:38	6:19	
4:44	6-7	5:32		6:20	
4:45	54167-4	5:33	5ms late	6:21	
4:46	9-706-7	5:34	5ms late	6:22	
4:47		5:35		6:23	
4:48		5:36		6:24	
4:49		5:37		6:25	
4:50		5:38		6:26	
4:51		5:39		6:27	
4:52		5:40		6:28	
4:53		5:41		6:29	
4:54		5:42		6:30	Xtra @ 30:35
4:55		5:43		6:31	
4:56		5:44		6:32	
4:57		5:45		6:33	
4:58	5-6 54202-3	5:46	Xtra @ 46:59	6:34	
4:59	8-9 5-6	5:47	No Shot	6:35	
5:00	54208-4	5:48	5ms late	6:36	
5:01	11-12	5:49		6:37	
5:02		5:50		6:38	
5:03		5:51		6:39	
5:04		5:52		6:40	
5:05		5:53		6:41	
5:06		5:54		6:42	
5:07		5:55	Xtra43:44->	6:43	Xtra @ 43:35
5:08		5:56		6:44	5ms late
5:09		5:57		6:45	5ms late
5:10		5:58		6:46	2.5ms late
5:11		5:59		6:47	
5:12		6:00		6:48	
5:13		6:01		6:49	
5:14		6:02		6:50	
5:15		6:03		6:51	
5:16		6:04		6:52	
5:17		6:05		6:53	

ESP 9 Airgun Shots

12-13 6:54		54550-1 7:42	4ms late	54694-5 8:30	3ms early
54409-10 6:55	Xtra @ 55:35	7:43		54720-12 8:31	Xtra @ 32:31
54418-18 6:56	5ms late	7:44		54 723-1 8:32	Xtra @ 32:44
54418-19 6:57	5ms late	7:45		6-7 3-4 8:33	5ms late
6:58		7:46		9-10 6-7 8:34	5ms late
6:59		7:47		12-13 54720-10 8:35	No Shot
7:00		7:48		15-16 12-13 8:36	10ms late
7:01		7:49		18-19 15-16 8:37	10ms late
7:02		7:50		21-22 18-19 8:38	3ms early
7:03		54537-8 7:51	Xtra @ 51:35	24-25 21-22 8:39	4ms early
42-43 7:04		54586-84 7:52	5ms late		8:40
54439-40 7:05	Xtra @ 6:51	54588-4 7:53	5ms late		8:41
45-64 7:06	Xtra @ 6:59	6-7 7:54		37-8 8:42	
48-9 45-46 7:07	No Shot	7:55		54734-5 8:43	Xtra @ 43:57
54248-49 7:08	5ms late	7:56			8:44
54451-2 7:09	2.5ms late	7:57			8:45
7:10		7:58			8:46
7:11		7:59			5ms early
7:12		54604-5 8:00	Xtra @ 1:35		5ms early
7:13		10-17-8 8:01	Xtra @ 1:44		
7:14		54618-11 8:02	5ms late		
7:15		54618-11 8:03	5ms late		
7:16		6-7 8:04			
81-2 7:17		8:05			4ms early
54478-9 7:18	Xtra @ 18:43	8:06			4ms early
54481-2 7:19	No Shot	8:07			
94-5 7:20	No Shot	8:08			
7:21	No Shot	8:09			5ms late
7:22	No Shot	8:10			
7:23	No Shot	73-11 8:11			
7:24	No Shot	54640-1 8:12	Xtra @ 12:22		
5-6 7:25	No Shot	6-7 2-4 8:13	5ms late		
54522-3 7:26	No Shot	9-50 6-7 8:14	5ms late		
7:27		8:15			
544-5 7:28		8:16			
54514-2 7:29	4ms early	8:17			
17-84-5 7:30	4ms early	8:18			
20-217-8 7:31	No Shot	8:19			
54520-1 7:32	No Shot	70-1 8:20			
6-7 3-4 7:33	No Shot	54667-8 8:21	Xtra @ 21:44		
9-30 15-7 7:34	9ms late	54673-4 8:22	11ms late		
54529-30 7:35	9ms late	54676-4 8:23	9ms late		
54532-3 7:36	4ms early	9-80 6-7 8:24	5ms late		
8-9 5-6 7:37	4ms early	54682-80 8:25	5ms late		
7:38		85-62-83 8:26	No Shot		
7:39		88-9 85-86 8:27	11ms late		
50-1 7:40		91-288-84 8:28	11ms late		
54542-8 7:41	4ms late	54691-92 8:29	3ms early		

last recorded

ESP 10 Airgun Shots

ESP 10 Airgun Shots

	10:25		11:13		12:01	
	10:26		11:14		12:02	
✓	55048-9	10:27	4ms early	11:15	12:03	
✓	55051-2	10:28	4ms early	11:16	12:04	
	10:29		11:17		12:05	
	10:30		11:18		12:06	
	10:31		11:19		12:07	
	10:32		11:20		12:08	
	10:33		11:21		12:09	
	10:34		11:22		12:10	
	10:35		11:23		12:11	
	10:36		11:24		12:12	
	10:37		11:25		12:13	
	10:38		11:26		12:14	
	10:39		11:27		12:15	
	10:40		11:28		12:16	
	10:41		11:29		12:17	
	10:42		11:30		12:18	
	10:43		11:31		12:19	
	10:44		11:32		12:20	
	10:45		11:33		12:21	
	10:46		11:34		12:22	
	10:47		11:35	55396-7	12:23	Xtra @ 24:06
	10:48		11:36	55399-400	12:24	Xtra @ 24:15
	10:49		11:37	✓55402-3	12:25	5ms large
	10:50		11:38	✓55405-6	12:26	5ms late
	10:51		11:39		12:27	
	10:52		11:40	55411-12	12:28	Xtra @ 28:30
	10:53		11:41		12:29	
	10:54		11:42	55417-8	12:30	Xtra @ 31:23
✓	55132-3	10:55	Xtra @ 56:35	55420-1	12:31	No Shot
✓	55135-6	10:56	Xtra @ 56:44	55423-4	12:32	?
✓	55138-9	10:57	5ms late		12:33	
✓	55141-2	10:58	5ms late	✓55429-30	12:34	3ms early
	10:59		11:47	✓55432-3	12:35	3ms early
	11:00		11:48		12:36	
	11:01		11:49		12:37	
	11:02		11:50		12:38	
	11:03		11:51		12:39	
	11:04		55303-4	11:52	Xtra @ 53:34	
	11:05		55306-7	11:53	Xtra @ 53:42	
	11:06		✓55309-10	11:54	5ms late	
	11:07		✓55312-3	11:55	2.5ms late	
	11:08		✓55315-6	11:56	2.5ms late	
	11:09		11:57		12:45	
	11:10		11:58	55465-6	12:46	No Shot
	11:11		11:59	✓55468-9	12:47	10ms late
	11:12		12:00		12:48	

ESP 10 Airgun Shots

12:49		13:37		14:25	
✓ 55477-8 12:50	3ms early	13:38		14:26	
✓ 55480-1 12:51	4ms early	13:39		14:27	
12:52		13:40		14:28	
12:53		13:41		14:29	
12:54		13:42		14:30	
12:55		13:43		14:31	
12:56		13:44		14:32	
12:57		13:45		14:33	
12:58		13:46		14:34	
12:59		13:47		14:35	
13:00		13:48		14:36	
13:01		13:49		14:37	
13:02		13:50		14:38	
13:03		13:51		14:39	
13:04		13:52		14:40	
13:05		13:53		14:41	
13:06		13:54		14:42	
13:07		13:55		14:43	
13:08		13:56		14:44	
13:09		13:57		14:45	
13:10		13:58		14:46	
13:11		13:59		14:47	
13:12		14:00		14:48	
13:13		14:01		14:49	
13:14		14:02		14:50	
13:15		14:03	55840-1	14:51	Xtra @ 51:45
13:16		14:04		14:52	
13:17		14:05	55846-7	14:53	5ms late
13:18		14:06	55849-50	14:54	5ms late
13:19		14:07		14:55	
13:20		14:08		14:56	
13:21		14:09		14:57	
13:22		14:10		14:58	
13:23		14:11		14:59	
13:24		14:12		15:00	
13:25		14:13		15:01	
55585-6 13:26	Xtra @ 27:16	14:14		15:02	
55588-9 13:27	Xtra @ 27:24	14:15		15:03	
✓ 55591-2 13:28	5ms slow	14:16		15:04	
✓ 55594-5 13:29	5ms slow	14:17		15:05	
13:30		14:18		15:06	
13:31		14:19		15:07	
13:32		14:20		15:08	
13:33		14:21		15:09	
13:34		14:22		15:10	
13:35		14:23		15:11	
13:36		14:24		15:12	

} not recorded

ESP 10 Airgun Shots

15:13		16:01	16:49
15:14		16:02	16:50
15:15		16:03	16:51
15:16		16:04	16:52
15:17		16:05	
15:18		16:06	
15:19		16:07	
15:20		16:08	
15:21		16:09	
15:22		16:10	
✓ 55936-7	15:23 Xtra @ 23:12	16:11	
✓ 55939-40	15:24 5ms late	16:12	
✓ 55942-3	15:25 5ms late	16:13	
	15:26	16:14	
	15:27	16:15	
	15:28	16:16	
	15:29	16:17	
	15:30	16:18	
	15:31	16:19	
	15:32	16:20	
	15:33	16:21	
	15:34	16:22	
	15:35	16:23	
	15:36	16:24	
	15:37	16:25	
	15:38	16:26	
	15:39	16:27	
	15:40	16:28	
	15:41	16:29	
	15:42	16:30	
	15:43	16:31	
	15:44	16:32	
	15:45	16:33	
✓ 56005-6	15:46 Xtra @ 47:35	16:34	
✓ 56008-9	15:47 Xtra @ 47:44	16:35	
✓ 56011-2	15:48 5ms late	16:36	
✓ 56014-5	15:49 5ms late	16:37	
	15:50	16:38	
	15:51	16:39	
	15:52	16:40	
	15:53	16:41	
	15:54	16:42	
	15:55	16:43	
	15:56	16:44	
	15:57	16:45	
	15:58	16:46	
	15:59	16:47	
	16:00	16:48	

ESP 11 Airgun Shots

20:33	3ms late	21:21		22:09	
20:34	3ms late	21:22		22:10	
20:35	No Shot	21:23		22:11	
20:36	No Shot	21:24		22:12	
20:37	No Shot	21:25		22:13	
20:38		1111-2 21:26	1.5ms late	22:14	
20:39		1114-5 21:27	1.5ms late	22:15	
20:40		1117-8 21:28	1.5ms late	22:16	
20:41		21:29		22:17	
20:42		21:30		22:18	
20:43		21:31		22:19	
20:44		21:32		22:20	
20:45		21:33		22:21	
20:46		21:34		22:22	
20:47		21:35		22:23	
20:48		21:36		22:24	
20:49		21:37		22:25	
20:50		21:38		22:26	
20:51		21:39		22:27	
20:52		21:40		22:28	
20:53		21:41		22:29	
20:54		21:42		22:30	
20:55		21:43		22:31	
20:56		21:44		22:32	
20:57		21:45		22:33	
20:58		21:46		22:34	
20:59		21:47		22:35	
21:00		21:48		22:36	
21:01		21:49		22:37	
21:02		21:50		22:38	
21:03		21:51		22:39	
21:04		21:52		22:40	
21:05		21:53		22:41	
21:06		21:54		22:42	
21:07		21:55		22:43	
21:08		21:56		22:44	
21:09		21:57		22:45	
21:10		21:58		22:46	
21:11		21:59		22:47	
21:12		22:00		22:48	
21:13		22:01		22:49	
21:14		22:02		22:50	
21:15		22:03		22:51	
21:16		22:04		22:52	
21:17		22:05		22:53	
21:18		22:06		22:54	
21:19		22:07		22:55	
21:20		22:08		22:56	

ESP 11 Airgun Shots

22:57		
22:58		
22:59		
23:00		
23:01		
23:02		
23:03		
23:04		
23:05		
23:06		
23:07		
23:08		
23:09		
23:10		
23:11		
23:12		
23:13		
23:14		
23:15		
23:16		
23:17		
23:18		
23:19		
23:20		
23:21		
23:22		
23:23		
1465-66	23:24	1s late
1468-69	23:25	1s late
	23:26	
	23:27	
1477-78	23:28	1s late
	23:29	
1483-4	23:30	1s late
	23:31	
	23:32	
	23:33	
	23:34	
	23:35	
1501-2	23:36	1s late
4-5	23:37	1s late
7-8	23:38	1s late
10-11	23:39	1s late
13-14	23:40	1s late

← RESYNC
FIRING TIMER
SEE AREA
AIRGUN RECORD PAGE 7

ESP 12 Airgun Shots

1:45		2:33		3:21	
1:46		2:34		3:22	
1:47		2:35		3:23	
1:48		2:36		3:24	
1:49		2:37		3:25	
1:50		2:38		3:26	
1:51		2:39		3:27	
1:52		2:40		3:28	
1:53		2:41		3:29	
1:54		2:42		3:30	
1:55		2:43		3:31	
1:56		2:44		3:32	
1:57		2:45		3:33	
1:58		2:46		3:34	
1:59		2:47		3:35	
2:00		2:48		3:36	
2:01		2:49		3:37	
2:02		2:50		3:38	
2:03		2:51		3:39	
2:04		2:52		3:40	
2:05		2:53		3:41	
2:06		2:54		3:42	
2:07		2:55		3:43	
2:08		2:56		3:44	
2:09		2:57		3:45	
2:10		2:58		3:46	
2:11		2:59		3:47	
2:12		3:00		3:48	
2:13		3:01		3:49	
2:14		3:02		3:50	
2:15		3:03		3:51	
2:16		3:04		3:52	
2:17		3:05		3:53	
2:18		3:06		3:54	
2:19		3:07		3:55	
2:20		3:08		3:56	
2:21		3:09		3:57	
2:22		3:10		3:58	
2:23		3:11			
2:24		3:12			
2:25		3:13			
2:26		3:14			
2:27		3:15			
2:28		3:16			
2:29		3:17			
2:30		3:18			
2:31		3:19			
2:32		3:20			

ESP 13 Airgun Shots

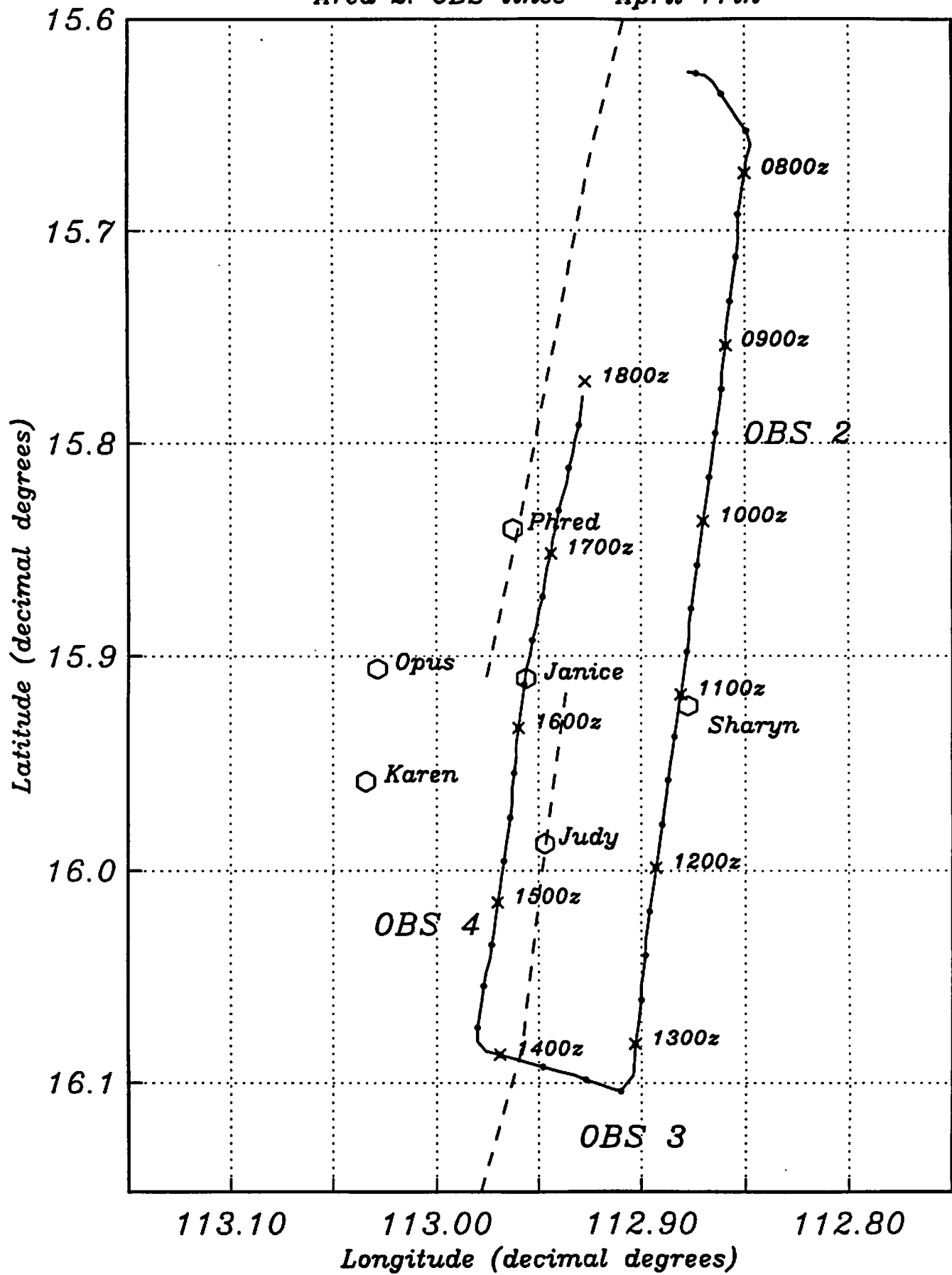
ESP 13 Airgun Shots

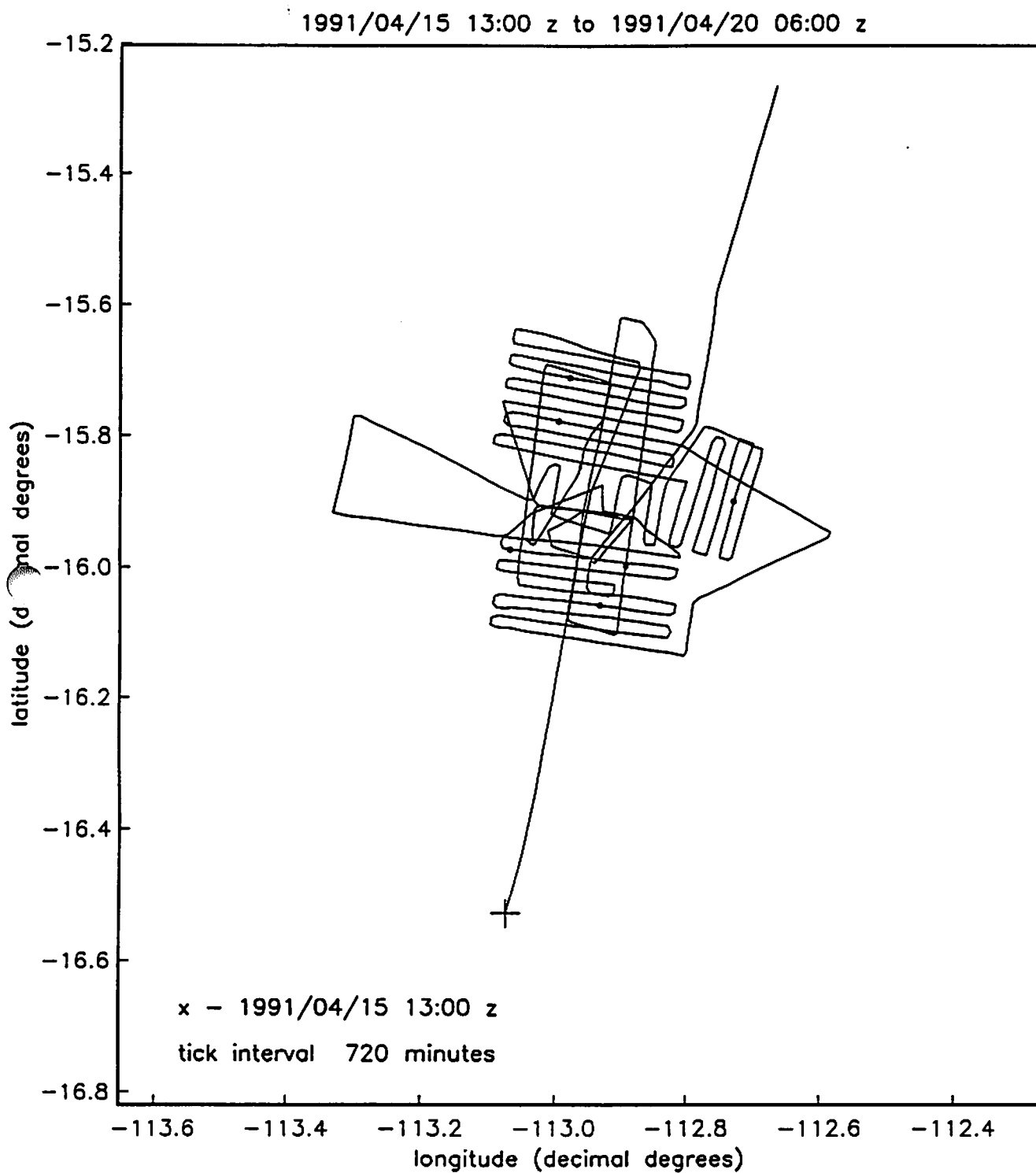
	7:58		849-50 8:46	7.5ms late	9:34	
	7:59		52-3 8:47	7.5ms late	9:35	
	8:00		55-6 8:48	7.5ms early	9:36	
	8:01		858-9 8:49	7.5ms early	9:37	
	8:02		8:50		9:38	
	8:03		8:51		9:39	
	8:04		8:52		9:40	
	8:05		8:53		9:41	
	8:06		8:54		9:42	
	8:07		8:55		9:43	
	8:08		8:56		9:44	
	8:09		8:57		9:45	
	8:10		8:58		9:46	
	8:11		8:59		9:47	
	8:12		9:00		9:48	
	8:13		9:01		1038-9 9:49	Xtra @ 49:08
	8:14		9:02		9:50	
	8:15		9:03		9:51	
	8:16		9:04		9:52	
	8:17		9:05		9:53	
	8:18		9:06		9:54	
	8:19		9:07		9:55	
771-2	8:20	Xtra @ 21:36	9:08		9:56	
4-5	8:21	Xtra @ 21:45	9:09		9:57	
7-8	8:22	5ms late	9:10		9:58	
	8:23		9:11		9:59	
	8:24		9:12		1071-2 10:00	Xtra @ 01:34
	8:25		9:13		4-5 10:01	Xtra @ 01:43
	8:26		9:14		7-8 10:02	5ms late
	8:27		9:15		1080-1 10:03	3ms late
	8:28		9:16		1083-4 10:04	3ms late
	8:29		9:17		10:05	
	8:30		9:18		10:06	
	8:31		9:19		10:07	
	8:32		9:20		10:08	
	8:33		9:21		10:09	
	8:34		9:22		10:10	
	8:35		9:23		10:11	
819-20	8:36	Xtra @ 37:10	9:24		10:12	
22-23	8:37	Xtra @ 37:19	9:25		10:13	
25-26	8:38	5ms late	9:26		10:14	
	8:39		9:27		10:15	
	8:40		9:28		1119-20 10:16	Xtra @ 17:07
	8:41		9:29		22-23 10:17	Xtra @ 17:16
837-8	8:42	7.5ms late	9:30		25-26 10:18	5ms late
840-41	8:43	7.5ms late	9:31		28-29 10:19	2.5ms late
43-4	8:44	7.5ms late	9:32		31-32 10:20	2.5ms late
6-7	8:45	No Shot	9:33		10:21	

ESP 13 Airgun Shots

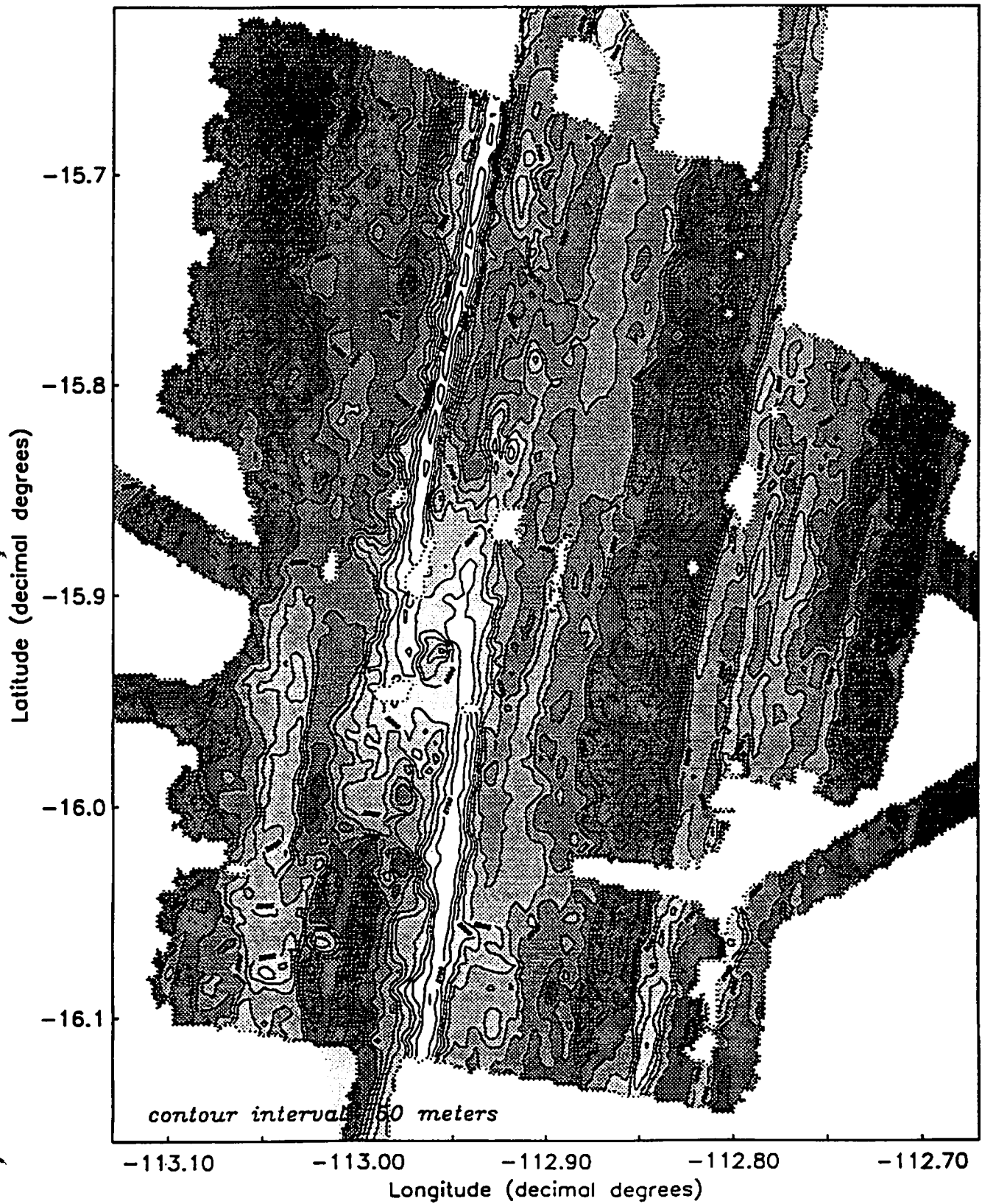
10:22		1281-2 11:10	Xtra @ 10:44
10:23		1284-5 11:11	5ms late
1143-4 10:24	No Shot	1287-8 11:12	2.5ms late
6-7 10:25	No Shot	1290-1 11:13	2.5ms late
1149-50 10:26	8ms late	11:14	
52-3 10:27	8ms late	11:15	
55-6 10:28	4ms early	11:16	
58-9 10:29	4ms early	11:17	
61-2 10:30	Xtra @ 30:35	11:18	
64-5 10:31	5ms late		
67-8 10:32	2.5ms late		
11 70-1 10:33	9ms late		
73-4 10:34	9ms late		
10:35			
10:36			
10:37			
10:38			
10:39			
10:40			
10:41			
10:42			
10:43			
10:44			
10:45			
10:46			
10:47			
10:48			
1218-19 10:49	Xtra @ 50:36		
21-22 10:50	Xtra @ 50:45		
24-25 10:51	5ms late		
10:52			
10:53			
10:54			
10:55			
10:56			
10:57			
10:58			
1218-49 10:59	Xtra @ 59:54		
1257-52 11:00	No Shot		
1254-5 11:01	4ms late		
1257-8 11:02	3ms early		
1250-1 11:03	3ms early		
11:04			
11:05			
11:06			
11:07			
11:08			
1278-9 11:09	Xtra @ 10:35		

Area 2: OBS lines - April 17th





TERA TERA



R/V Washington Airgun Operations in Area 2:
15° 55'S OSC: April 17th 1991

The R/V Washington airgun lines in Area 2 were shot as one continuous line, but have been subdivided into three nearly linear sections, OBS 2-4. OBS 2 & 4 trend approximately north-south parallel to the rise-axis, and OBS 3 is a connecting east-west segment.

OBS 2

	Latitude	Longitude	J.Day	Time(UTC)
Start	15° 37.6' S	112° 52.6' W	107	07:23
End	16° 05.5' S	112° 54.5' W	107	13:15

Line Length: 52 km

Comments

Passed over OBS Sharyn at 11:05z. R/V Washington location: 15° 55.4'S, 112° 52.9' W.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: every 40 secs at 00 on the even minute, 40, & 20.

Report:

07:11 Started airguns at a 60 sec. repetition rate firing at 00.
07:16 Switched to firing at 40 sec. interval.
07:47 Course change to 190°. Position 15° 39.26'S, 112° 50.95'W.
13:15 Course change to 286°; end of OBS 2.

OBS 3

	Latitude	Longitude	J.Day	Time(UTC)
Start	16° 05.5' S	112° 54.5' W	107	13:15
End	16° 05.8' S	112° 58.6' W	107	14:06

Line Length: 7.3 km

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: every 40 secs at 00 on the even minute, 40, & 20.

Report:

14:06 Course change to 008. End of OBS 3.

OBS 4

	Latitude	Longitude	J.Day	Time(UTC)
Start	16° 05.8' S	112° 58.6' W	107	14:06
End	15° 46.8' S	112° 55.7' W	107	17:55

Line Length: 36 km

Comments

Passed over OBS Janice at 16:17z. R/V Washington location 15° 54.7'S 112° 57.4'W.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: every 40 secs at 00 on the even minute, 40, & 20.

Report:

17:55 Airguns turned off.

TERA TIME DRIFT 2

TIME	OFFSET(USEC)	TIME	DELTA T (DAYS)	DELTA T (SEC)	DRIFT (USEC)	INIT. OFFSET (USEC)	DRIFT RATE (USEC/SEC)
DEPLOYMENT 2							
PHRED							
107/0341	1480	4/17/91 3:41				PHRED	
109/1523	-2300	4/19/91 15:23	2.4875	214920	-3780	1480	-0.01758794
KAREN							
107/0141	476	4/17/91 1:41				KAREN	
109/2324	-4520	4/19/91 23:24	2.904861111	250980	-4996	476	-0.019905969
JUDY							
106/1755	455	4/16/91 17:55				JUDY	
110/0136	-6540	4/20/91 1:36	3.320138889	286860	-6995	455	-0.024384717
JANICE							
106/2153	383	4/16/91 21:53				JANICE	
109/2106	6480	4/19/91 21:06	2.967361111	256380	6097	383	0.023781106
SHARYN							
106/2012	314	4/16/91 20:12				SHARYN	
109/1910	-4630	4/19/91 19:10	2.956944444	255480	-4944	314	-0.019351808
OPUS							
106/2352	495	4/16/91 23:52				OPUS	
109/1350	6390	4/19/91 13:50	2.581944444	223080	5895	495	0.026425498

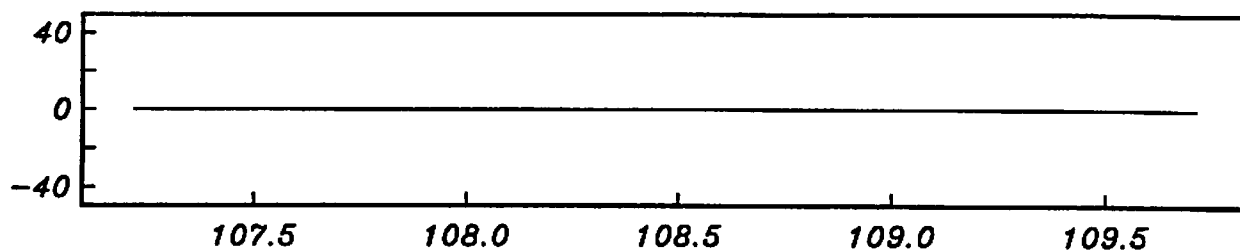
**TERA 01
OBS TIME LOG**

DEPLOYMENT NO. 2

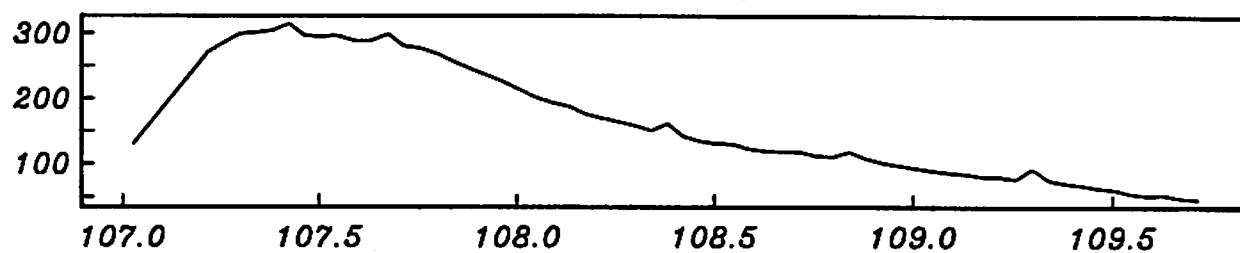
OBS	EVENT	TIME(Z)	OFFSET(μS)
PHRED	Final Clock Set	105/2306	+352
"	Clock Check	107/0234	+1410
"	Clock Check	107/0341	+1480
"	Post Recovery	109/1523	-2300
KAREN	Final Clock Set	106/2249	+310
"	Clock Check	107/0035	+432
"	Clock Check	107/0141	+476
"	Post Recovery	109/2324	-4520
JUDY	Final Clock Set	105/2017	+300
"	Clock Check	106/1711	+475
"	Clock Check	106/1755	+455
"	Post Recovery	110/0136	-6540
"	Post Recovery	110/1347	-7240
"	Post Recovery	110/1510	-7460
JANICE	Final Clock Set	105/2221	+720
"	Clock Check	106/2123	+279
"	Clock Check	106/2153	+383
"	Post Recovery	109/2106	+6480
"	Post Recovery	110/0925	+8270
"	Post Recovery	110/1100	+22700(?)
SHARYN	Final Clock Set	106/0450	+1170
"	Final Clock Set	106/1928	+250
"	Clock Check	106/2012	+314
"	Post Recovery	109/1910	-4630
"	Post Recovery	110/0601	-4020
OPUS	Final Clock Set	106/0209	+500
"	Final Clock Set	106/2322	+405
"	Clock Check	106/2352	+495
"	Post Recovery	109/1350	+6390
"	Post Recovery	110/0319	+8080

Sharyn Deployment 2

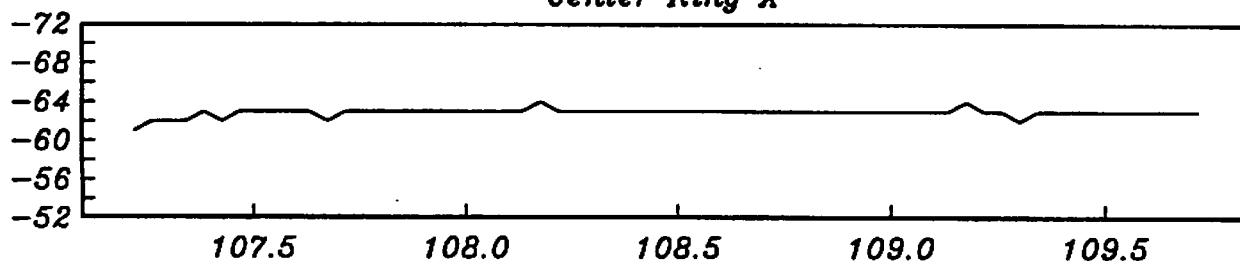
Tiltmeter X



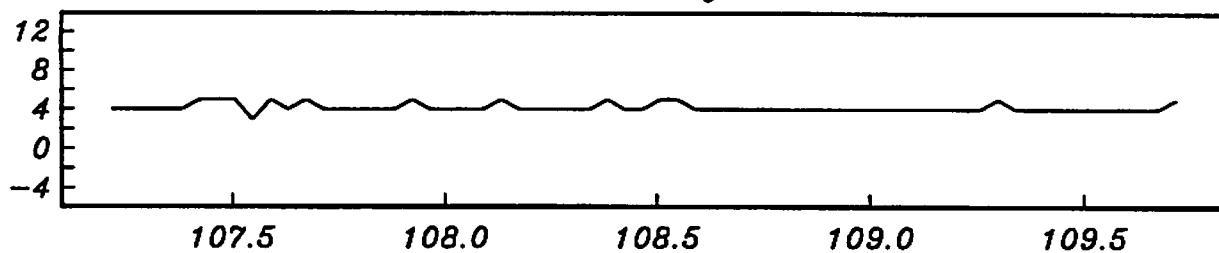
Tiltmeter Y



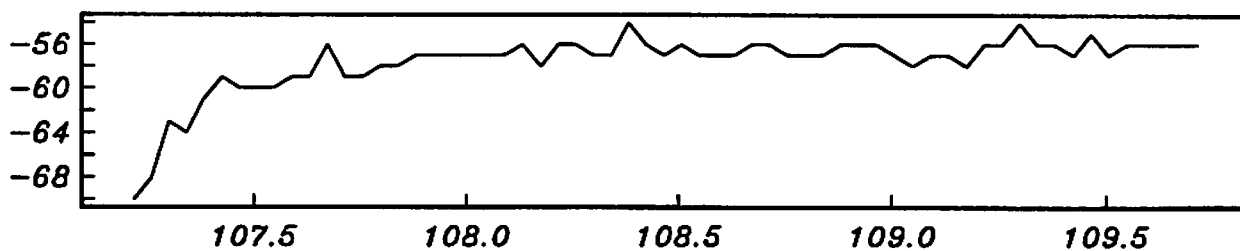
Center Ring X



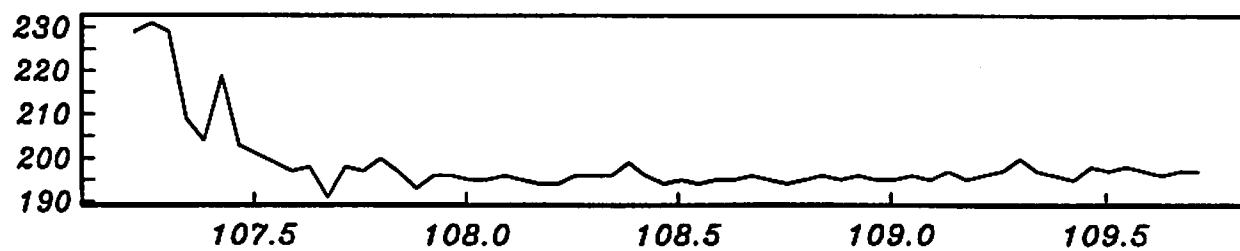
Center Ring Y



Taco Pounder X



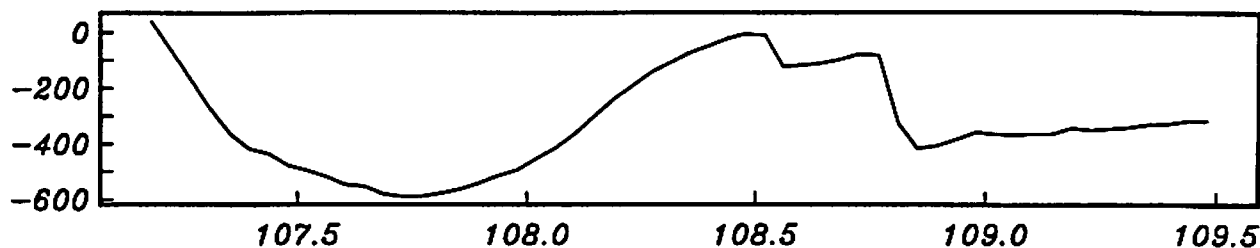
Taco Pounder Y



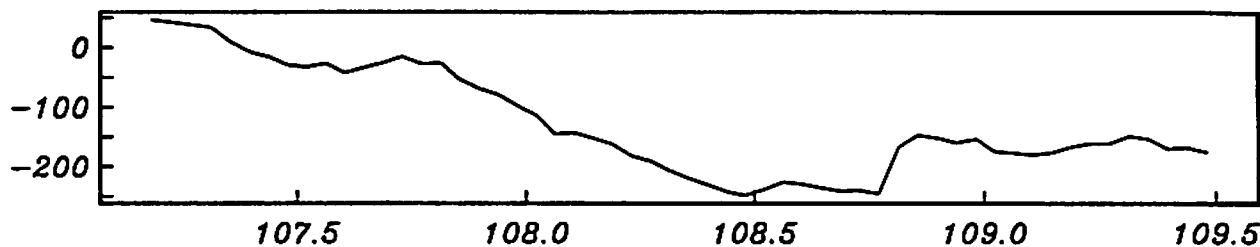
Julian Date

Opus Deployment 2

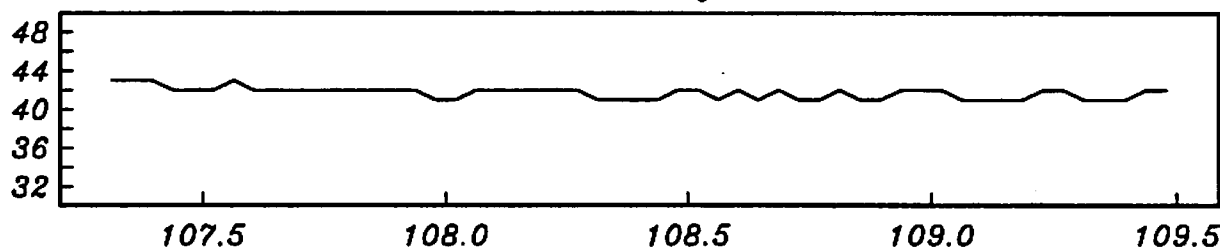
Tiltmeter X



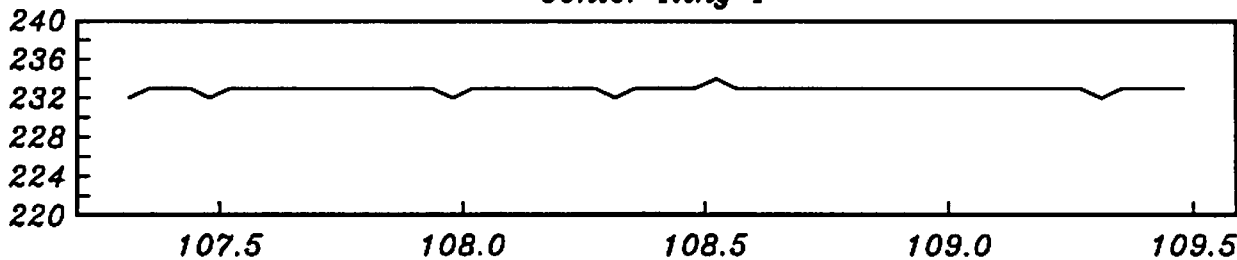
Tiltmeter Y



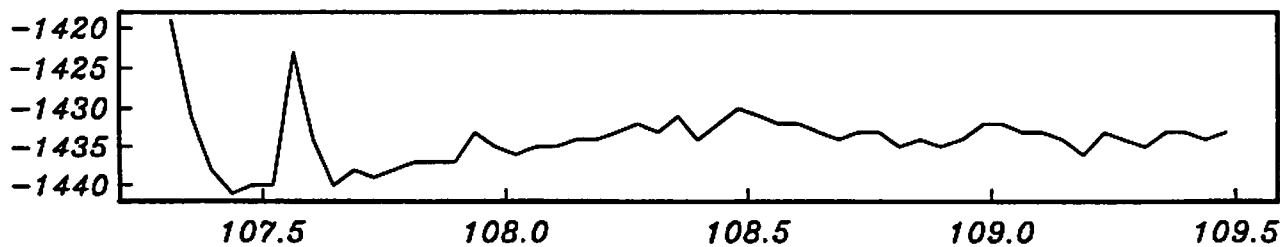
Center Ring X



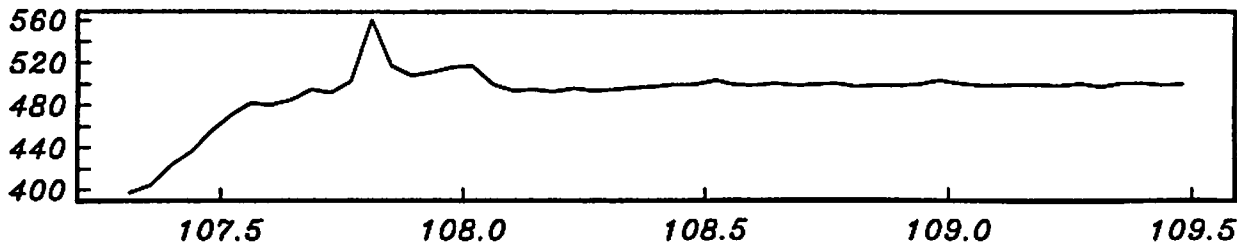
Center Ring Y



Taco Pounder X



Taco Pounder Y



Julian Date

Area 2 Velocity profile

Location: 15° 54.8'S 112° 57.4'W
Date: 16th April 1991 (Julian day 106).

XBT data

Temperature (°C)	Depth (m)
26.0	1.3
25.0	67.6
24.0	77.4
23.0	106.8
22.0	146.8
21.0	168.5
20.0	184.1
19.0	207.0
18.0	221.7
17.0	239.1
16.0	250.0
15.0	263.4
14.0	272.6
13.0	287.9
12.0	298.2
11.0	318.3
10.0	344.7
9.0	382.6
8.0	431.1

XBT selected points

Temperature (°C)	Depth (m)
25.7	2.6
25.5	65.1
23.6	85.1
23.2	100.0
22.4	131.1
21.6	159.2
19.6	192.2
19.2	200.0
16.4	246.6
13.2	284.4
11.9	300.0
10.1	341.1
9.0	384.3
8.8	400.0
7.5	459.7

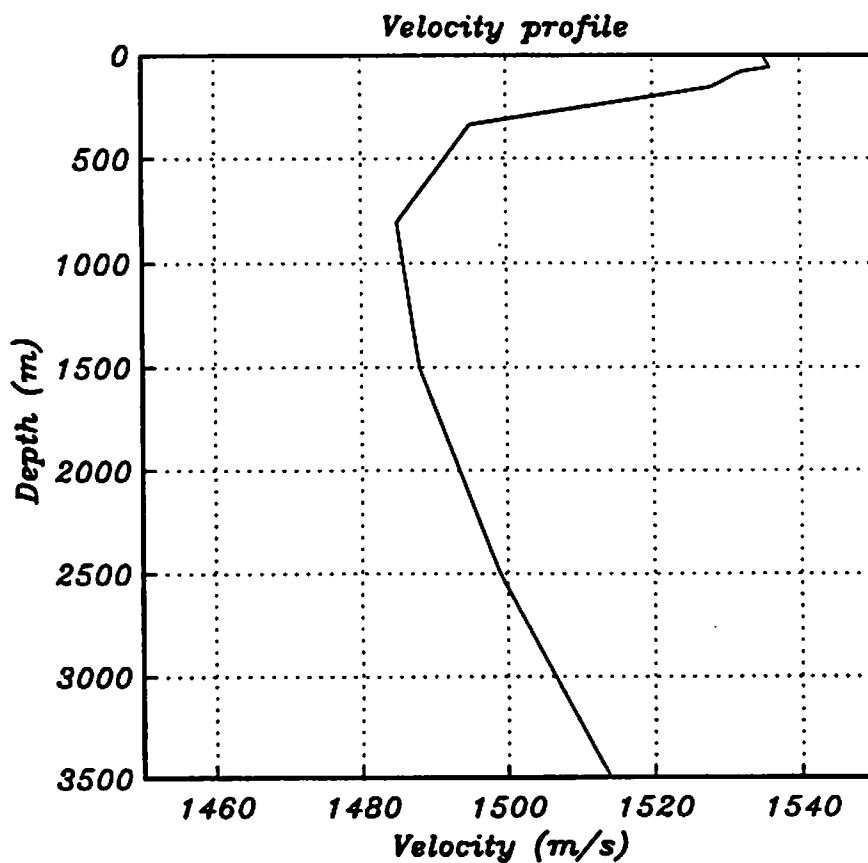
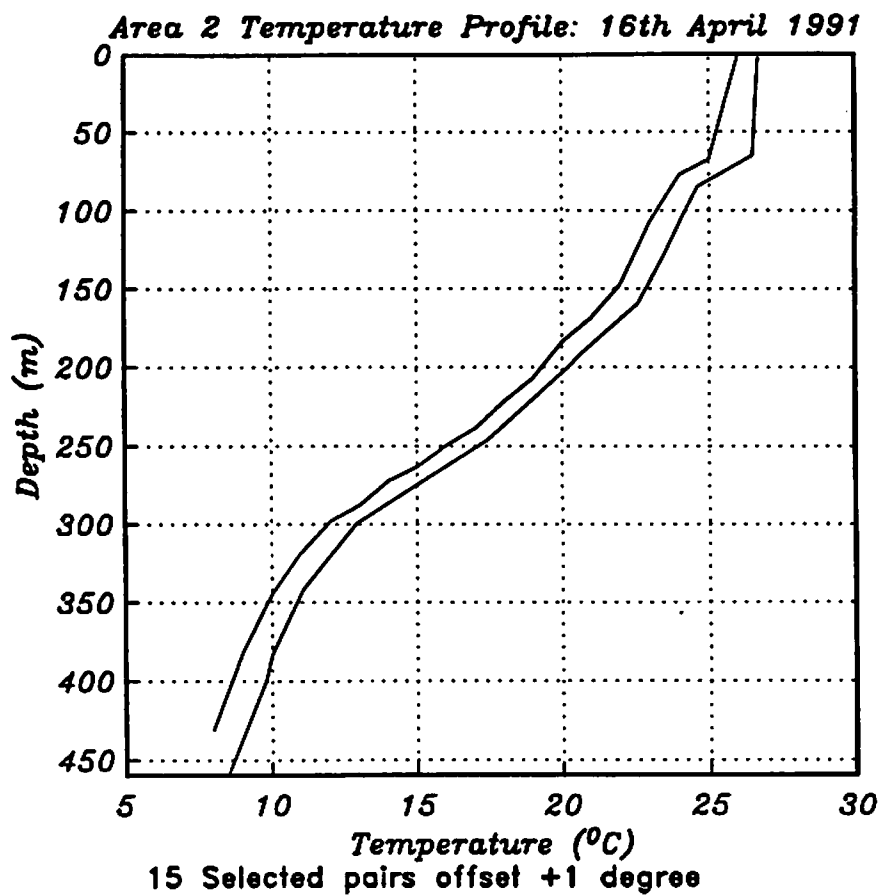
Velocity function

Velocity (m/s)	Depth (m)
1535	3
1536	65
1532	85
1528	159
1495	341
1485	800
1488	1500
1499	2500
1514	3500
1589	7500

Notes:

Velocities as entered into Sea Beam

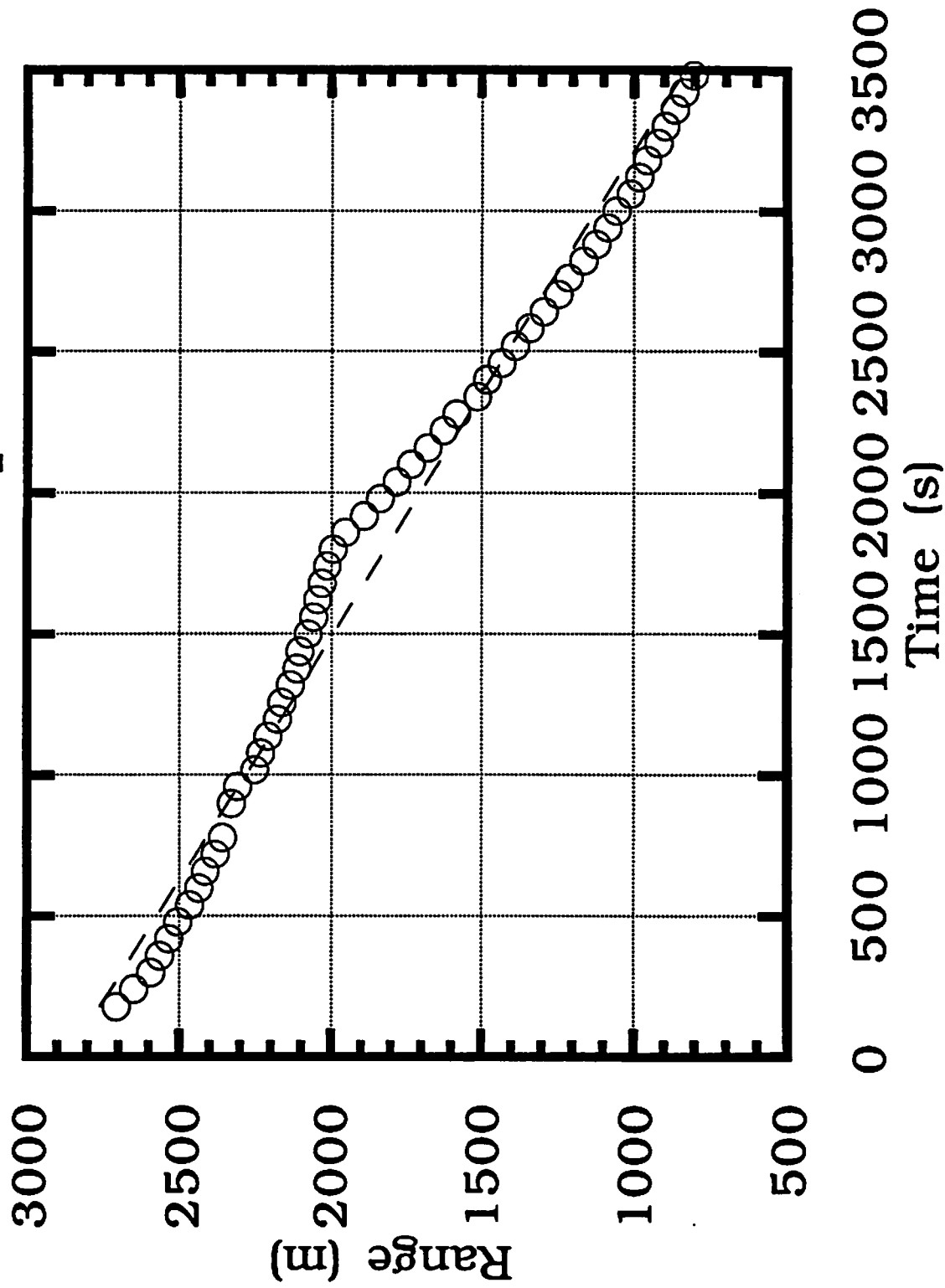
Carter Table Area 57 used at depths of 800m or greater. Carter Table Area 54 applies west of 113° W. See area 1 for table 54 values.



Location: 15° 54.8S 112° 57.4' W

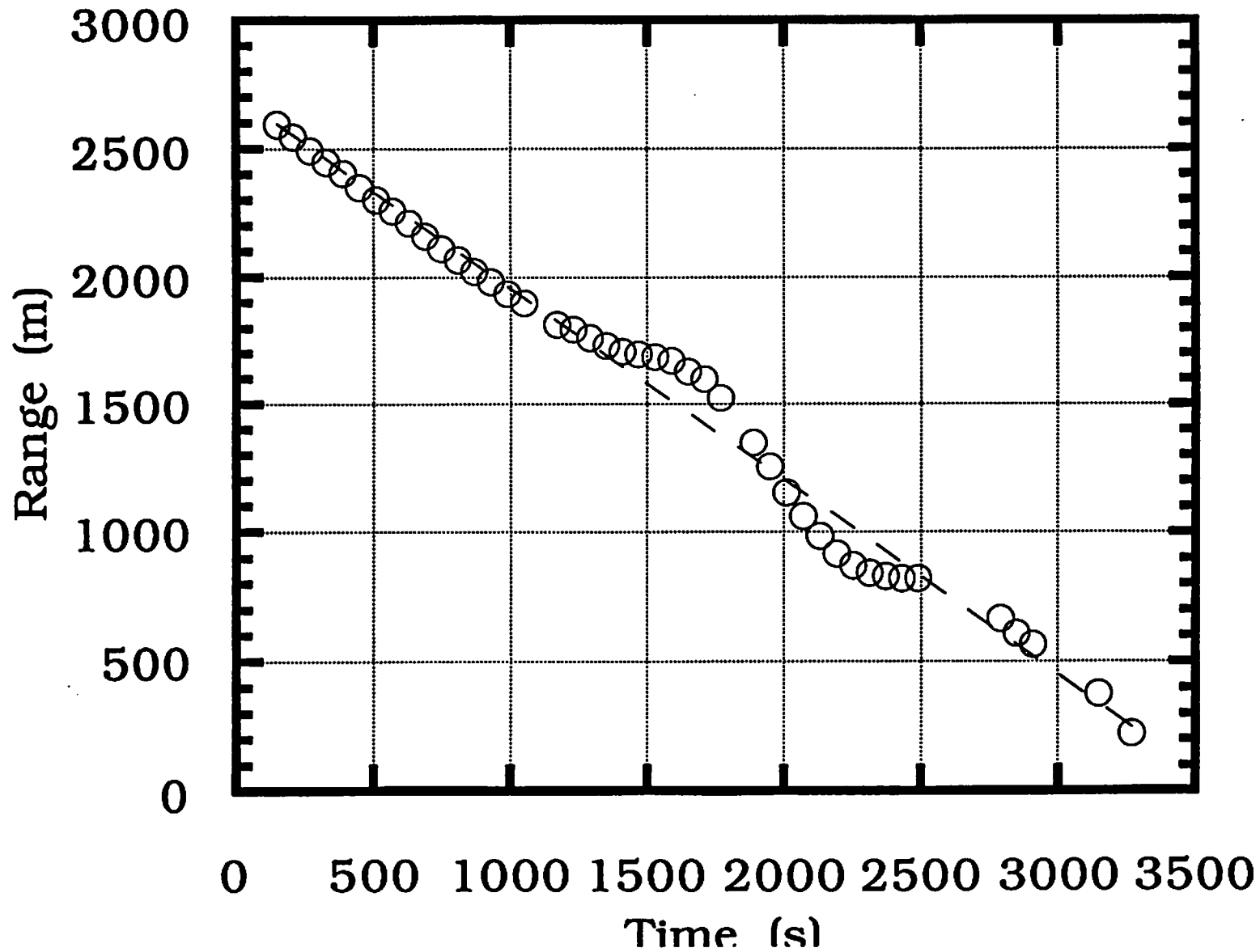
-- $-y = 2864.2 + -0.58023x$ $R = 0.99076$

Janice Drop #2



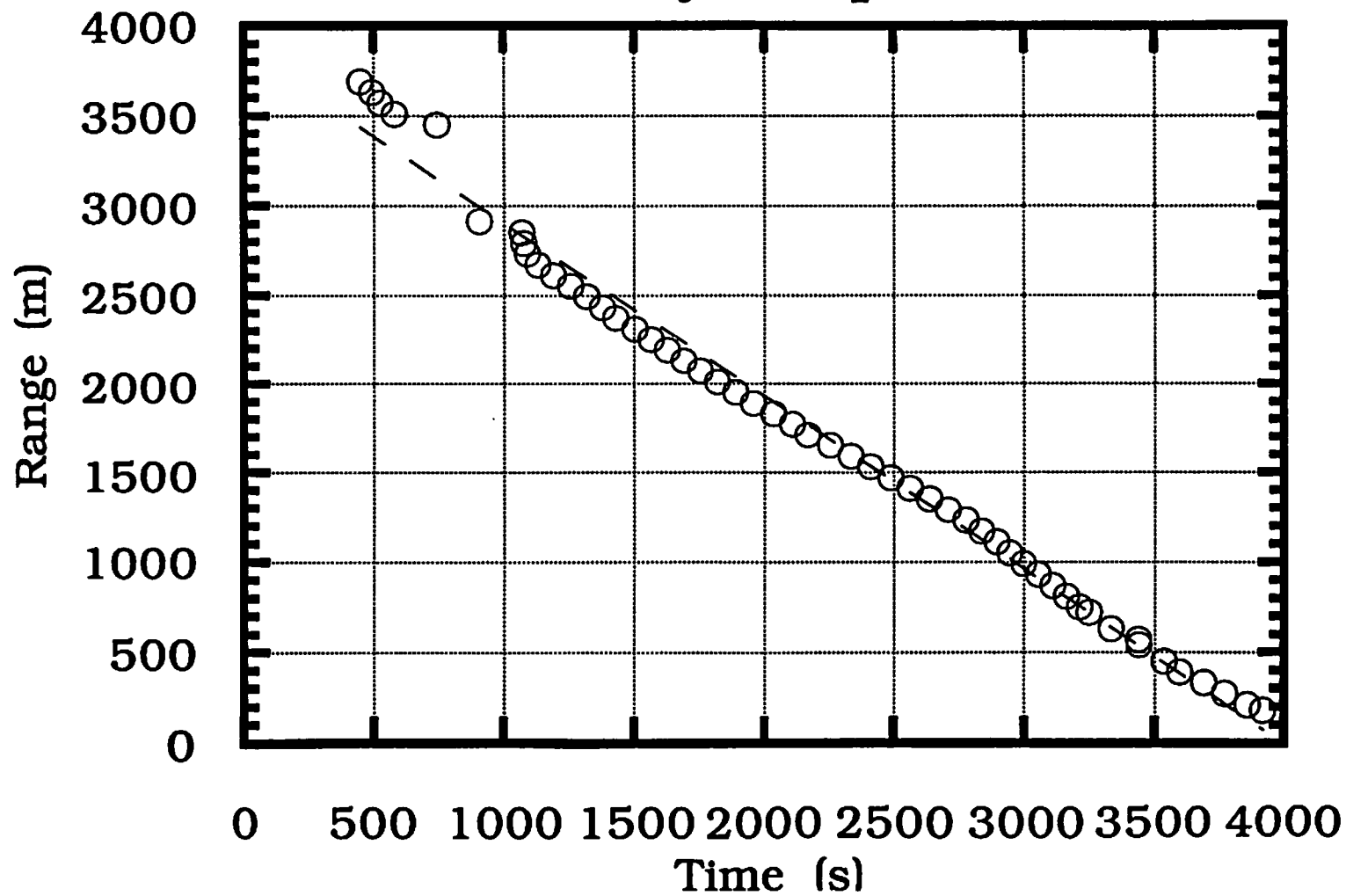
-- $-y = 2709.6 + -0.7527x$ $R = 0.99296$

Phred Drop #2



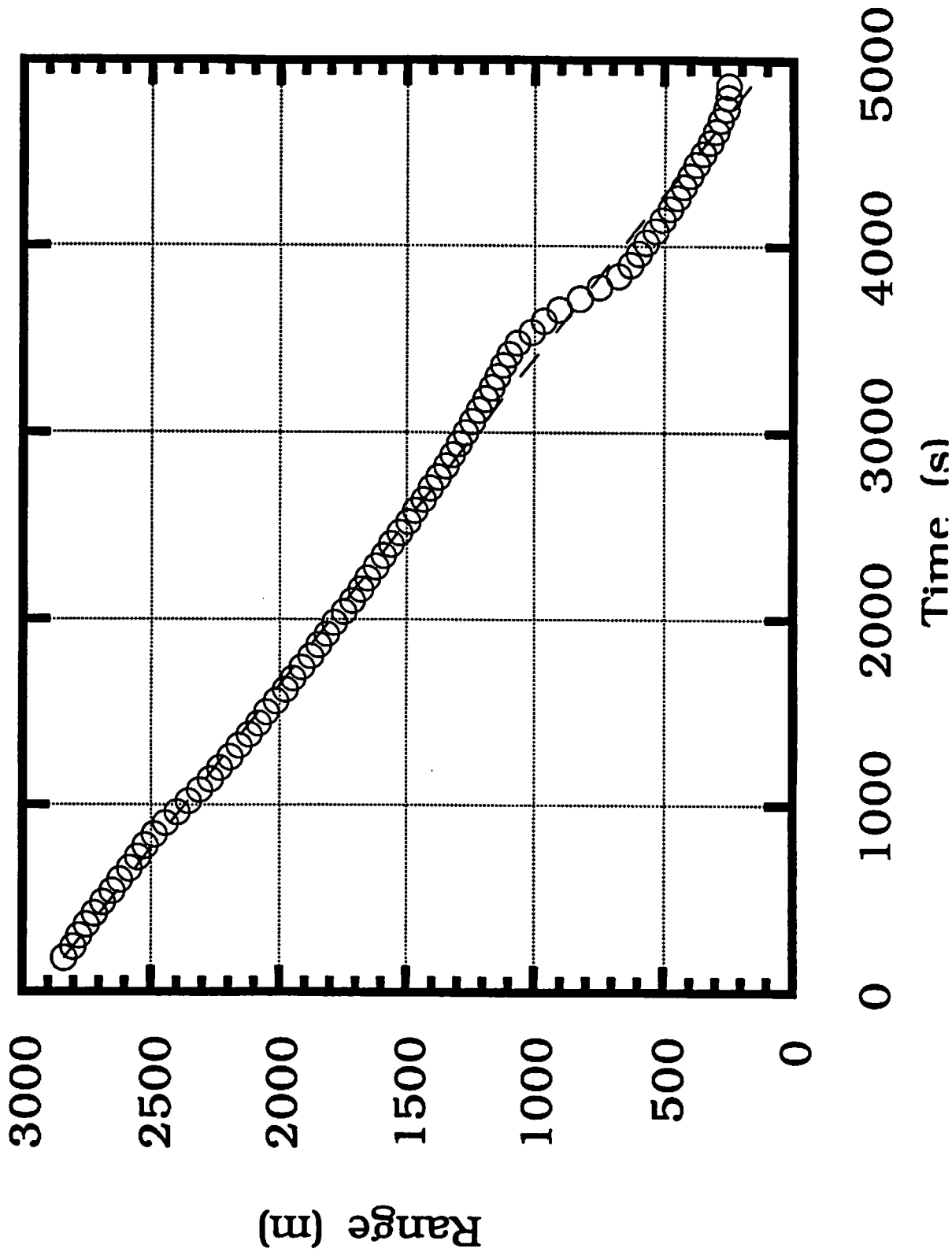
-- $y = 3873.1 + -0.9701x$ $R = 0.99491$

Sharyn Drop #2

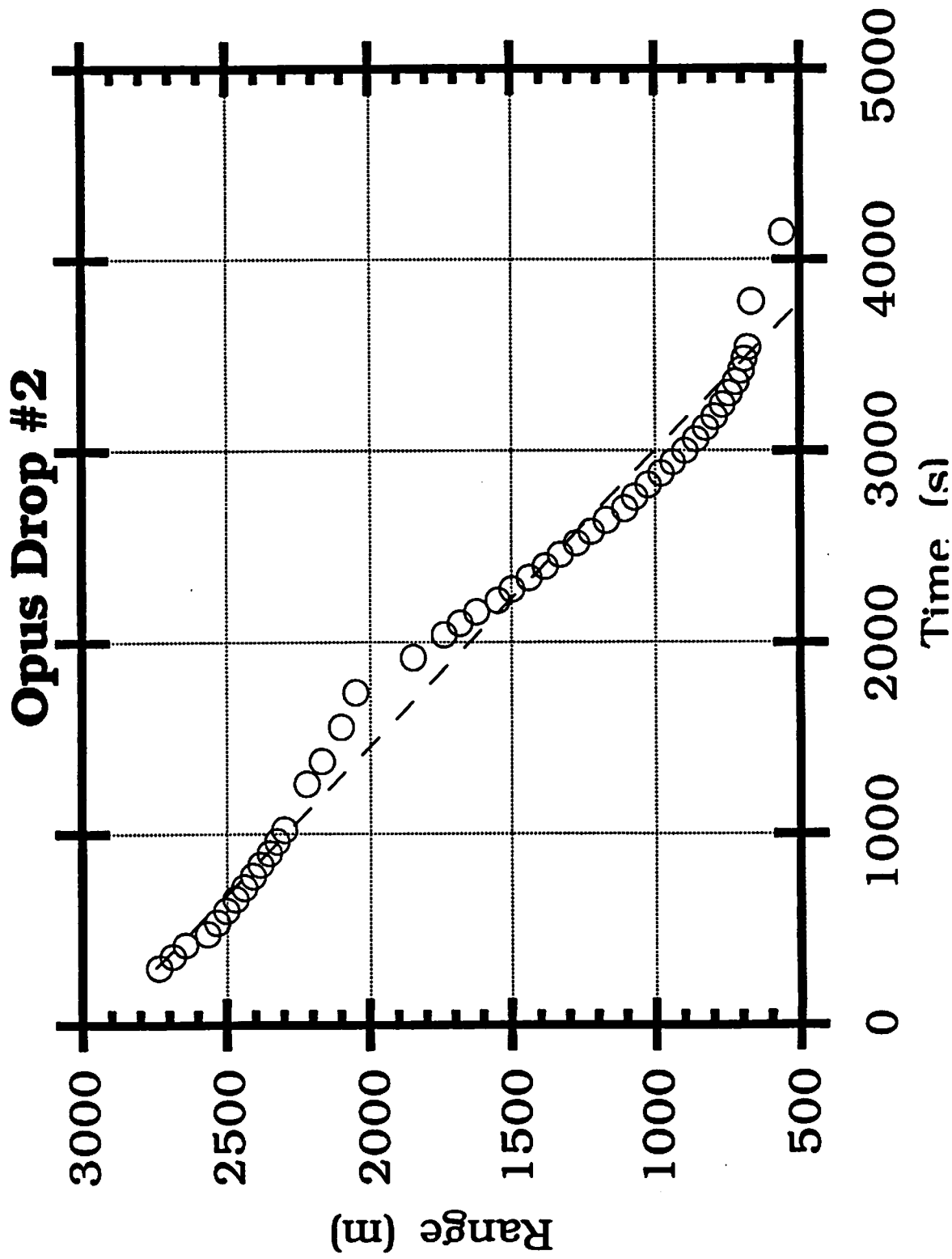


$$---y = 2940 + -0.5705x \quad R = 0.99829$$

Karen Drop #2



--y = 2941.1 + -0.6464x R= 0.99123



Area 2, "Line1" Airgun Shots

Area 2, "Line 1" Airgun Shots

23:13:00	2ms late	23:46:20		0:18:20	
23:14:00	2ms late	23:47:00		0:19:00	
23:15:00		23:47:40		0:19:40	
23:16:00		23:48:20		0:20:20	
23:17:00		23:49:00		0:21:00	
23:17:40		23:49:40		0:21:40	
23:18:20		23:50:20		0:22:20	
23:19:00		23:51:00		0:23:00	
23:19:40	1s late	23:51:40		0:23:40	
23:20:20		23:52:20		0:24:20	
23:21:00		23:53:00		0:25:00	
23:21:40		23:53:40		0:25:40	
23:22:20		23:54:20		0:26:20	
23:23:00		23:55:00		0:27:00	
23:23:40		23:55:40		0:27:40	
23:24:20		23:56:20		0:28:20	
23:25:00		23:57:00		0:29:00	
23:25:40		23:57:40		0:29:40	
23:26:20		23:58:20		0:30:20	
23:27:00		23:59:00		0:31:00	
23:27:40		23:59:40		0:31:40	
23:28:20		0:00:20		0:32:20	
23:29:00		0:01:00		0:33:00	
23:29:40		0:01:40		0:33:40	
23:30:20		0:02:20		0:34:20	
23:31:00		0:03:00		0:35:00	
23:31:40		0:03:40		0:35:40	
23:32:20		0:04:20		0:36:20	
23:33:00		0:05:00		0:37:00	
23:33:40		0:05:40		0:37:40	
23:34:20		0:06:20		0:38:20	
23:35:00		0:07:00		0:39:00	
23:35:40		0:07:40		0:39:40	
23:36:20		0:08:20		0:40:20	
23:37:00		0:09:00		0:41:00	
23:37:40		0:09:40		0:41:40	
23:38:20		0:10:20		0:42:20	
23:39:00		0:11:00		0:43:00	
23:39:40		0:11:40		0:43:40	
23:40:20		0:12:20		0:44:20	
23:41:00		0:13:00		0:45:00	
23:41:40		0:13:40		0:45:40	
23:42:20		0:14:20		0:46:20	
23:43:00		0:15:00		0:47:00	
23:43:40		0:15:40		0:47:40	
23:44:20		0:16:20		0:48:20	
23:45:00		0:17:00		0:49:00	
23:45:40		0:17:40		0:49:40	

Area 2, "Line1" Airgun Shots

0:50:20		1:22:20		1:54:20	
0:51:00		1:23:00		1:55:00	
0:51:40		1:23:40		1:55:40	
0:52:20		1:24:20		1:56:20	
0:53:00		1:25:00		1:57:00	
0:53:40		1:25:40		1:57:40	
0:54:20		1:26:20		1:58:20	
0:55:00		1:27:00		1:59:00	
0:55:40		1:27:40		1:59:40	
0:56:20		1:28:20		2:00:20	
0:57:00		1:29:00		2:01:00	
0:57:40		1:29:40		2:01:40	
0:58:20		1:30:20		2:02:20	
0:59:00		1:31:00		2:03:00	
0:59:40		1:31:40		2:03:40	
1:00:20		1:32:20		2:04:20	
1:01:00		1:33:00		2:05:00	
1:01:40		1:33:40		2:05:40	
1:02:20		1:34:20		2:06:20	
1:03:00		1:35:00		2:07:00	
1:03:40		1:35:40		2:07:40	
1:04:20		1:36:20		2:08:20	
1:05:00		1:37:00		2:09:00	
1:05:40		1:37:40		2:09:40	
1:06:20		1:38:20		2:10:20	
1:07:00	3ms early	1:39:00		2:11:00	
1:07:40		1:39:40		2:11:40	
1:08:20		1:40:20		2:12:20	
1:09:00		1:41:00		2:13:00	
1:09:40		1:41:40		2:13:40	
1:10:20		1:42:20		2:14:20	
1:11:00		1:43:00		2:15:00	
1:11:40		1:43:40		2:15:40	
1:12:20		1:44:20		2:16:20	
1:13:00		1:45:00		2:17:00	
1:13:40		1:45:40		2:17:40	
1:14:20		1:46:20		2:18:20	
1:15:00		1:47:00		2:19:00	
1:15:40		1:47:40		2:19:40	
1:16:20		1:48:20		2:20:20	
1:17:00		1:49:00		2:21:00	
1:17:40		1:49:40		2:21:40	
1:18:20		1:50:20		2:22:20	
1:19:00		1:51:00		2:23:00	
1:19:40		1:51:40		2:23:40	
1:20:20		1:52:20		2:24:20	
1:21:00		1:53:00		2:25:00	
1:21:40		1:53:40		2:25:40	

Area 2, "Line1" Airgun Shots

2:26:20		2:58:20		3:30:20	
2:27:00		2:59:00		3:31:00	
2:27:40		2:59:40		3:31:40	
2:28:20		3:00:20		3:32:20	
2:29:00		3:01:00		3:33:00	
2:29:40		3:01:40		3:33:40	
2:30:20		3:02:20		3:34:20	
2:31:00		3:03:00		3:35:00	
2:31:40		3:03:40		3:35:40	
2:32:20		3:04:20		3:36:20	
2:33:00		3:05:00		3:37:00	
2:33:40		3:05:40		3:37:40	
2:34:20		3:06:20		3:38:20	
2:35:00		3:07:00		3:39:00	
2:35:40		3:07:40		3:39:40	
2:36:20		3:08:20		3:40:20	
2:37:00		3:09:00		3:41:00	
2:37:40		3:09:40		3:41:40	
2:38:20		3:10:20		3:42:20	
2:39:00		3:11:00		3:43:00	
2:39:40		3:11:40		3:43:40	
2:40:20		3:12:20		3:44:20	
2:41:00		3:13:00		3:45:00	
2:41:40		3:13:40		3:45:40	
2:42:20		3:14:20		3:46:20	
2:43:00		3:15:00		3:47:00	
2:43:40		3:15:40		3:47:40	
2:44:20		3:16:20		3:48:20	
2:45:00		3:17:00		3:49:00	
2:45:40		3:17:40		3:49:40	
2:46:20		3:18:20		3:50:20	
2:47:00		3:19:00		3:51:00	
2:47:40		3:19:40		3:51:40	
2:48:20		3:20:20		3:52:20	
2:49:00		3:21:00		3:53:00	
2:49:40		3:21:40		3:53:40	
2:50:20		3:22:20		3:54:20	
2:51:00		3:23:00		3:55:00	
2:51:40		3:23:40		3:55:40	
2:52:20		3:24:20		3:56:20	
2:53:00		3:25:00		3:57:00	
2:53:40		3:25:40		3:57:40	
2:54:20		3:26:20		3:58:20	
2:55:00		3:27:00		3:59:00	
2:55:40		3:27:40		3:59:40	
2:56:20		3:28:20		4:00:20	
2:57:00		3:29:00		4:01:00	
2:57:40		3:29:40		4:01:40	

Area 2, "Line1" Airgun Shots

4:02:20		4:34:20		5:06:20	
4:03:00		4:35:00		5:07:00	
4:03:40		4:35:40		5:07:40	
4:04:20		4:36:20		5:08:20	
4:05:00		4:37:00		5:09:00	
4:05:40		4:37:40		5:09:40	
4:06:20		4:38:20		5:10:20	
4:07:00		4:39:00		5:11:00	
4:07:40		4:39:40		5:11:40	
4:08:20		4:40:20		5:12:20	
4:09:00		4:41:00		5:13:00	
4:09:40		4:41:40		5:13:40	
4:10:20		4:42:20		5:14:20	
4:11:00		4:43:00		5:15:00	
4:11:40		4:43:40		5:15:40	
4:12:20		4:44:20		5:16:20	
4:13:00		4:45:00		5:17:00	
4:13:40		4:45:40		5:17:40	
4:14:20		4:46:20		5:18:20	
4:15:00		4:47:00		5:19:00	
4:15:40		4:47:40		5:19:40	
4:16:20		4:48:20	No Shot	5:20:20	
4:17:00		4:49:00		5:21:00	
4:17:40		4:49:40		5:21:40	
4:18:20		4:50:20		5:22:20	
4:19:00		4:51:00		5:23:00	
4:19:40		4:51:40		5:23:40	
4:20:20		4:52:20		5:24:20	
4:21:00		4:53:00		5:25:00	
4:21:40		4:53:40		5:25:40	
4:22:20		4:54:20		5:26:20	
4:23:00		4:55:00		5:27:00	
4:23:40		4:55:40		5:27:40	
4:24:20		4:56:20		5:28:20	
4:25:00		4:57:00		5:29:00	
4:25:40		4:57:40		5:29:40	
4:26:20		4:58:20		5:30:20	
4:27:00		4:59:00		5:31:00	
4:27:40		4:59:40		5:31:40	
4:28:20		5:00:20		5:32:20	
4:29:00		5:01:00		5:33:00	
4:29:40		5:01:40		5:33:40	
4:30:20		5:02:20		5:34:20	
4:31:00		5:03:00		5:35:00	
4:31:40		5:03:40		5:35:40	
4:32:20		5:04:20		5:36:20	
4:33:00		5:05:00		5:37:00	
4:33:40		5:05:40		5:37:40	

Area 2, "Line1" Airgun Shots

5:38:20		6:10:20		6:42:20	
5:39:00		6:11:00		6:43:00	
5:39:40		6:11:40		6:43:40	
5:40:20		6:12:20		6:44:20	
5:41:00		6:13:00		6:45:00	
5:41:40		6:13:40		6:45:40	
5:42:20		6:14:20		6:46:20	
5:43:00		6:15:00		6:47:00	
5:43:40		6:15:40		6:47:40	
5:44:20		6:16:20		6:48:20	
5:45:00		6:17:00		6:49:00	
5:45:40		6:17:40		6:49:40	
5:46:20		6:18:20		6:50:20	
5:47:00		6:19:00		6:51:00	
5:47:40		6:19:40		6:51:40	
5:48:20		6:20:20		6:52:20	
5:49:00		6:21:00		6:53:00	
5:49:40		6:21:40		6:53:40	
5:50:20		6:22:20		6:54:20	
5:51:00		6:23:00		6:55:00	
5:51:40		6:23:40		6:55:40	
5:52:20		6:24:20		6:56:20	
5:53:00		6:25:00		6:57:00	
5:53:40		6:25:40		6:57:40	
5:54:20		6:26:20		6:58:20	
5:55:00		6:27:00		6:59:00	
5:55:40		6:27:40		6:59:40	
5:56:20		6:28:20		7:00:20	
5:57:00		6:29:00		7:01:00	
5:57:40		6:29:40		7:01:40	
5:58:20		6:30:20		7:02:20	
5:59:00		6:31:00		7:03:00	
5:59:40		6:31:40		7:03:40	
6:00:20		6:32:20		7:04:20	
6:01:00		6:33:00		7:05:00	
6:01:40		6:33:40		7:05:40	
6:02:20		6:34:20		7:06:20	
6:03:00		6:35:00		7:07:00	
6:03:40		6:35:40		7:07:40	
6:04:20		6:36:20		7:08:20	
6:05:00		6:37:00		7:09:00	
6:05:40		6:37:40		7:09:40	
6:06:20		6:38:20		7:10:20	
6:07:00		6:39:00		7:11:00	
6:07:40		6:39:40		7:11:40	
6:08:20		6:40:20		7:12:20	
6:09:00		6:41:00		7:13:00	
6:09:40		6:41:40		7:13:40	

Area 2, "Line1" Airgun Shots

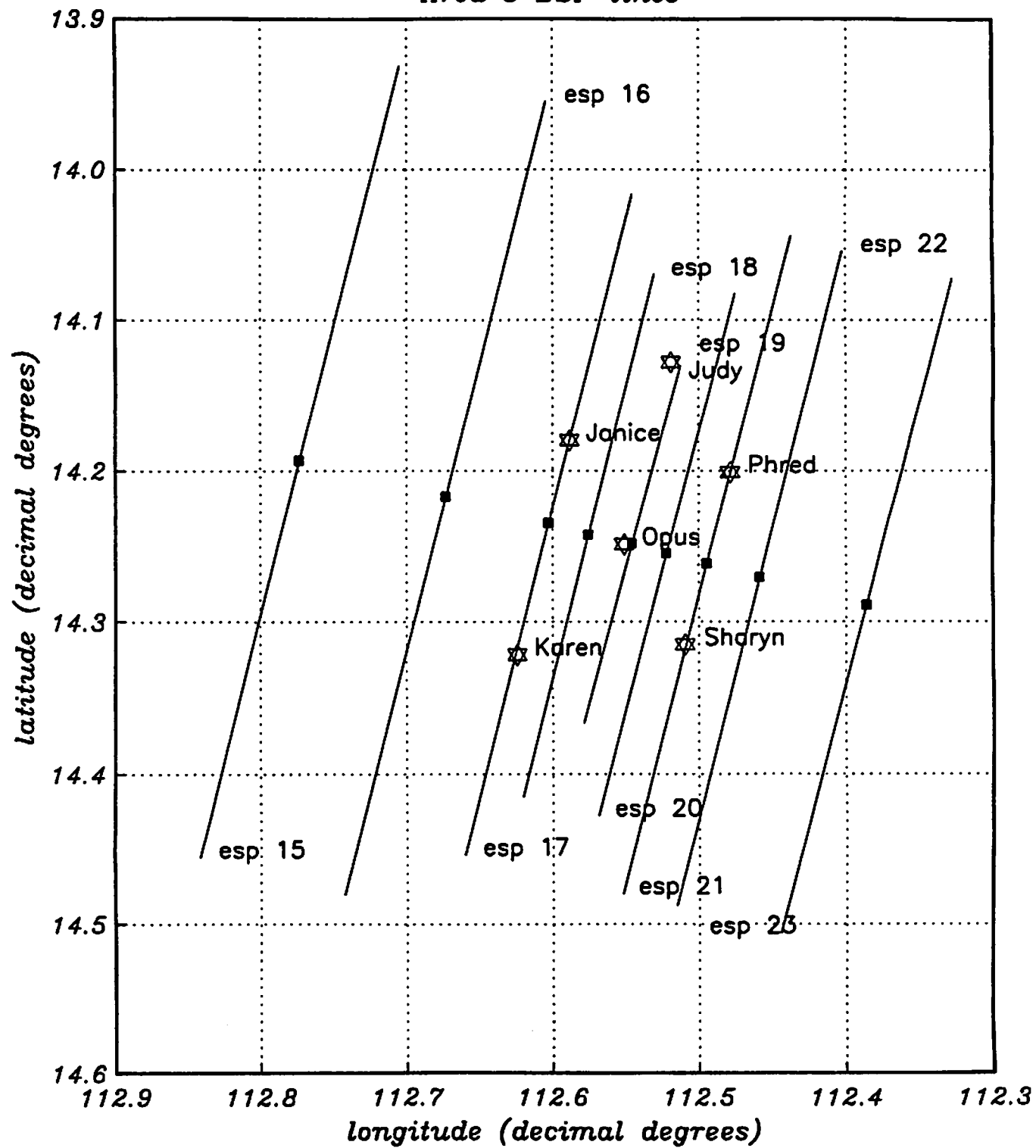
7:14:20		7:46:20	
7:15:00		7:47:00	
7:15:40		7:47:40	
7:16:20		7:48:20	
7:17:00		7:49:00	
7:17:40		7:49:40	
7:18:20		7:50:20	
7:19:00		7:51:00	
7:19:40		7:51:40	
7:20:20		7:52:20	
7:21:00		7:53:00	
7:21:40		7:53:40	
7:22:20		7:54:20	
7:23:00		7:55:00	
7:23:40		7:55:40	
7:24:20		7:56:20	
7:25:00		7:57:00	
7:25:40		7:57:40	
7:26:20		7:58:20	
7:27:00		7:59:00	
7:27:40		7:59:40	
7:28:20		8:00:20	
7:29:00		8:01:00	
7:29:40		8:01:40	
7:30:20		8:02:20	
7:31:00		8:03:00	
7:31:40		8:03:40	
7:32:20		8:04:20	
7:33:00		8:05:00	
7:33:40		8:05:40	
7:34:20		8:06:20	
7:35:00		8:07:00	
7:35:40		8:07:40	
7:36:20		8:08:20	
7:37:00		8:09:00	
7:37:40		8:09:40	
7:38:20		8:10:20	
7:39:00		8:11:00	
7:39:40		8:11:40	
7:40:20		8:12:20	
7:41:00		8:13:00	
7:41:40		8:13:40	
7:42:20		8:14:20	
7:43:00		8:15:00	
7:43:40		8:15:40	
7:44:20		8:16:20	
7:45:00		8:17:00	
7:45:40		8:17:40	

Area 2, "Line2" Airgun Shots

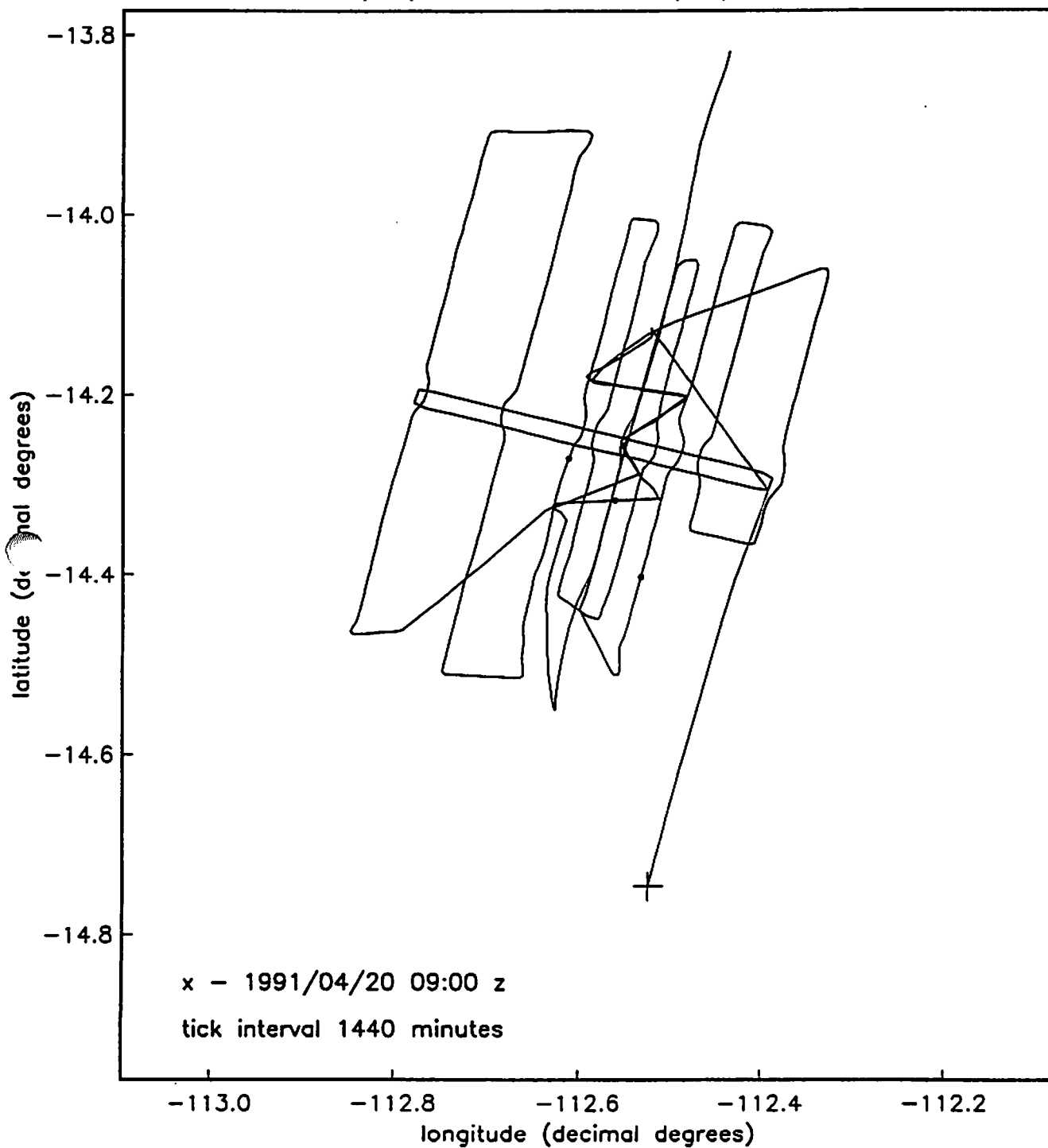
Area 2, "Line 2" Airgun Shots

8:25:40		8:57:40		9:29:40	
8:26:20		8:58:20		9:30:20	
8:27:00		8:59:00		9:31:00	
8:27:40		8:59:40		9:31:40	
8:28:20		9:00:20		9:32:20	
8:29:00		9:01:00		9:33:00	
8:29:40		9:01:40		9:33:40	
8:30:20		9:02:20		9:34:20	
8:31:00		9:03:00		9:35:00	
8:31:40		9:03:40		9:35:40	
8:32:20		9:04:20		9:36:20	
8:33:00		9:05:00		9:37:00	
8:33:40		9:05:40		9:37:40	
8:34:20		9:06:20		9:38:20	
8:35:00		9:07:00		9:39:00	
8:35:40		9:07:40		9:39:40	
8:36:20		9:08:20		9:40:20	
8:37:00		9:09:00		9:41:00	
8:37:40		9:09:40		9:41:40	
8:38:20		9:10:20		9:42:20	
8:39:00		9:11:00		9:43:00	
8:39:40		9:11:40		9:43:40	
8:40:20		9:12:20		9:44:20	
8:41:00		9:13:00		9:45:00	
8:41:40		9:13:40		9:45:40	
8:42:20		9:14:20		9:46:20	
8:43:00		9:15:00		9:47:00	
8:43:40		9:15:40		9:47:40	
8:44:20		9:16:20		9:48:20	
8:45:00		9:17:00		9:49:00	
8:45:40		9:17:40		9:49:40	
8:46:20		9:18:20		9:50:20	
8:47:00		9:19:00		9:51:00	
8:47:40		9:19:40		9:51:40	
8:48:20		9:20:20		9:52:20	
8:49:00		9:21:00		9:53:00	
8:49:40		9:21:40		9:53:40	
8:50:20		9:22:20		9:54:20	
8:51:00		9:23:00		9:55:00	
8:51:40		9:23:40			
8:52:20		9:24:20			
8:53:00		9:25:00			
8:53:40		9:25:40			
8:54:20		9:26:20			
8:55:00		9:27:00			
8:55:40		9:27:40			
8:56:20		9:28:20			
8:57:00		9:29:00			

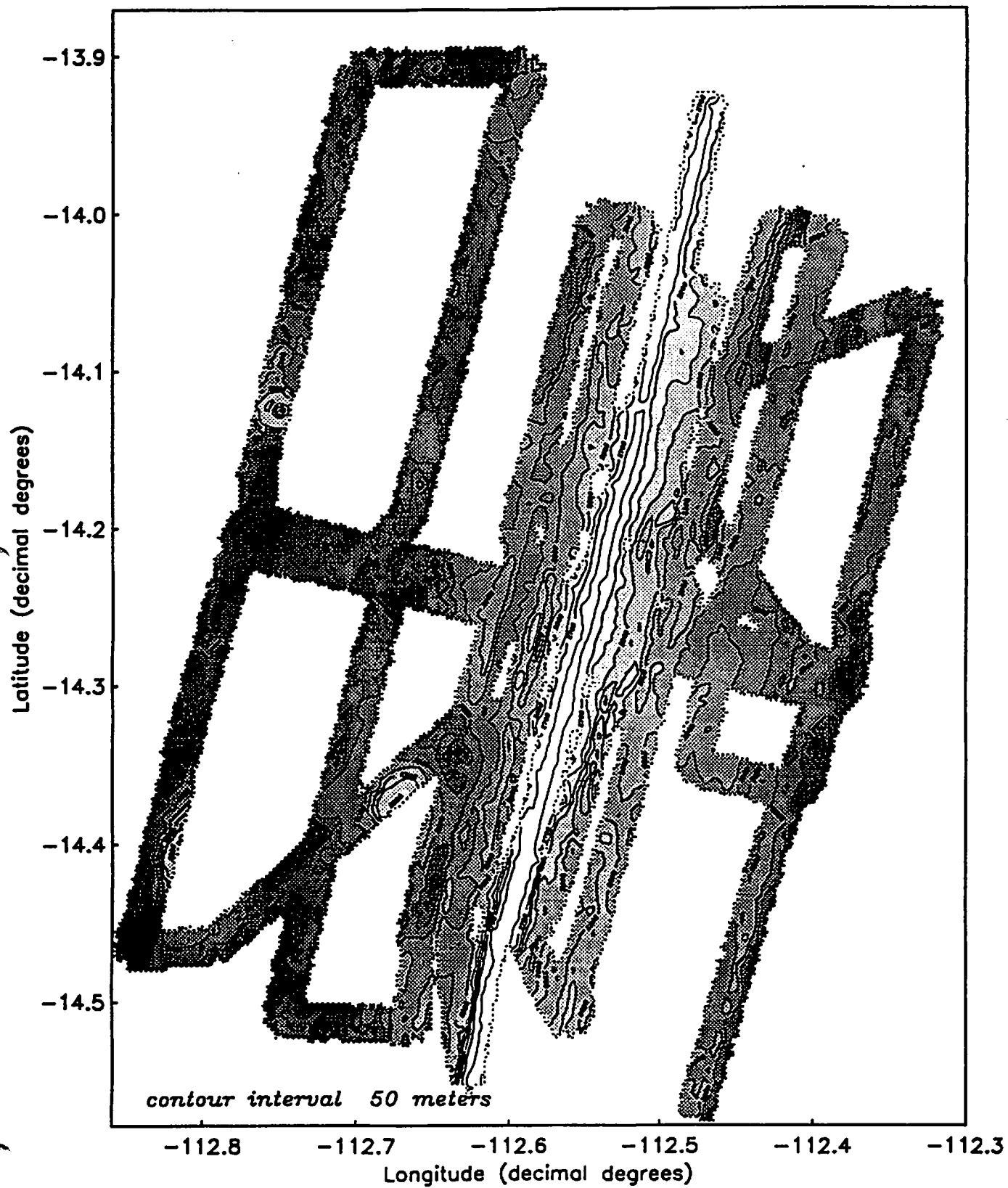
Area 3 ESP lines



1991/04/20 09:00 z to 1991/04/24 16:00 z



TERA TERA TERA!



R/V Washington Airgun Operations in Area 3:
14° 00'S - 14° 30'S; April 21st-24th 1991

ESP 15

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 27.3' S	112° 50.5' W	111	3:13	O
Midpoint	14° 11.65' S	112° 46.4' W	111	6:31	O
End	13° 55.95' S	112° 42.3' W	111	9:45	O

Line Length: 60.0 km
 Offset from Ridge: 24.8 km West
 Approximate age 320 ka

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
 Total Capacity: 2600 cu. in.
 Firing rate: 60 secs on 00

Report:

All guns fired throughout line

ESP 16

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	13° 57.30' S	112° 36.25' W	111	11:54	O
Midpoint	14° 13.05' S	112° 40.40' W	111	15:32	O
End	14° 28.80' S	112° 44.55' W	111	19:17	O

Line Length: 60.0 km
 Offset from Ridge: 13.7 km West
 Approximate age 180 ka

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
 Total Capacity: 2600 cu. in.
 Firing rate: 60 secs on 00

Report:

17:43 Leak in the #6 gun (200 cu. in.). Pressure at 1650 p.s.i.
 18:00 Airgun #6 shut off. O-ring failure.
 18:34 Airgun #6 back on line. All 6 guns firing.

ESP 17

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 27.2' S	112° 39.60' W	111	21:27	O
Midpoint	14° 14.1' S	112° 36.15' W	112	0:25	O
End	14° 01.0' S	112° 32.70' W	112	3:23	O

Line Length: 50.1 km
Offset from Ridge: 5.8 km West
Approximate age 75 ka

Comments:

R/V Ewing delayed the end time of the ESP by 6 minutes during the second half of the ESP, putting the R/V Washington ahead of schedule.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00

Report:

All guns worked throughout the ESP.

ESP 18

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 04.20' S	112° 31.8' W	112	5:00	O
Midpoint	14° 14.55' S	112° 34.5' W	112	7:27	O
End	14° 24.90' S	112° 37.2' W	112	9:49	O

Line Length: 39.5 km
Offset from Ridge: 2.8 km West
Approximate age 35 ka

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00
Target speed 4.5 kts.(139 m/min).

Report:

All guns worked throughout the ESP.

ESP 19

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 07.8' S	112° 30.7' W	112	17:28	G
Midpoint	14° 14.9' S	112° 32.7' W	112	19:01	G
End	14° 22.0' S	112° 34.7' W	112	20:34	G

Line Length: 30.5 km
Offset from Ridge: Rise-axis line
Approximate age 0 ka

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00
Target speed 4.5 kts.(139 m/min).

Report:

All guns worked throughout the ESP.

17:33 First shot of the line.

20:37 Last shot of the line.

ESP 20

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 25.65' S	112° 34.1' W	112	11:09	G
Midpoint	14° 15.30' S	112° 31.3' W	112	13:35	G
End	14° 04.95' S	112° 34.7' W	112	15:45	G

Line Length: 39.6 km

Offset from Ridge: 3.1 km East

Approximate age 40 ka

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.

Total Capacity: 2600 cu. in.

Firing rate: 60 secs on 00

Report:

11:08 First shot of the line.

12:11 Guns fired 7 secs late.

15:53 Last shot of the line.

ESP 21

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 28.75' S	112° 33.10' W	112	22:58	G
Midpoint	14° 15.70' S	112° 29.65' W	113	5:58	O
End	14° 02.65' S	112° 26.20' W	113	4:42	O

Line Length: 49.9 km

Offset from Ridge: 6.2 km East

Approximate age 80 ka

Comments

End time of line at 4.8 kts was 04:38 and the Ewing delayed it by 4 minutes.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.

Total Capacity: 2600 cu. in.

Firing rate: 60 secs on 00

Target speed 4.8 kts (148 m/min).

Report:

22:58 First shot of the line.

00:12 Airgun #4 (760 cu. in.) off.

00:39 Airgun #4 back on.

04:43 Last shot of the line.

ESP 22

Position R/V Washington	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 03.25' S	112° 24.10' W	113	6:10	O
Midpoint	14° 16.25' S	112° 27.50' W	113	8:47	O
End	14° 20.74' S	112° 28.63' W	113	9:51	G

Position R/V Ewing	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 29.25' S	112° 30.9' W	113	6:10	O
Midpoint	14° 16.25' S	112° 27.5' W	113	8:47	O
End	14° 12.00' S	112° 26.4' W	113	9:22	G

Line Length: 49.6km
Offset from Ridge: 10.2 km East
Approximate age: 80 ka

Comments

Only the incoming part of the ESP was officially shot. After the crossing the 2 ships continued along the ESP track before turning to start ESP 23. The end times correspond to when the ship started its turn.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00

Report:

09:51-10:52 The R/V Washington continued to shoot on the minute during the turn to start ESP 23.
10:18-10:28 Low pressure 1600 p.s.i. due to a temporary compressor problem.

ESP 23

Position R/V Washington	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 22.20' S	112° 24.42' W	113	10:52	O
Midpoint	14° 17.35' S	112° 23.15' W	113	11:52	O
End	14° 04.35' S	112° 19.65' W	113	14:41	O

Position R/V Ewing	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 13.60' S	112° 22.00' W	113	10:54	O
Midpoint	14° 17.35' S	112° 23.15' W	113	11:52	O
End	14° 30.35' S	112° 26.90' W	113	14:41	O

Line Length: 49.7km
Offset from Ridge: 18.3 km East
Approximate age: 235 ka

Comments

Only the outgoing part of the ESP was shot. The two ships lined up on the ESP track approximately 5 Nm from the midpoint & 1 hr before starting the ESP at the midpoint.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: 60 secs on 00

Report:

14:48 Airguns turned off. All guns worked throughout ESP.

WAP 1

Position	Latitude	Longitude	J.Day	Time(UTC)	Source
Start	14° 31.62' S	112° 37.42' W	114	6:14	O
End	13° 44.67' S	112° 25.25' W	114	17:00	O

Comments

During the Wide Aperture Profile both the Washington & the Ewing fired every 40 secs with the shot times of the two ships staggered by 20s. The target separation between the ships was set at 4 Nm (7.4 km) and was maintained by the Washington using radar.

Airgun Log

Airguns: 300, 550, 640, 760, 150, 200 cu. in.
Total Capacity: 2600 cu. in.
Firing rate: Every 40 secs on 00 for the even minutes, 40, & 20 sec past.

TERA TIME DRIFT 3

TIME	OFFSET(USEC)	TIME	DELTA T	DELTA T	DRIFT	INIT. OFFSET	DRIFT RATE
			(DAYS)	(SEC)	(USEC)	(USEC)	(USEC/SEC)
DEPLOYMENT 3							
PHRED							
110/2011	1100	4/20/91 20:11				PHRED	
113/2209	-2780	4/23/91 22:09	3.081944444	266280	-3880	1100	-0.014571128
KAREN							
111/0017	1220	4/21/91 0:17				KAREN	
114/0140	-3680	4/24/91 1:40	3.057638889	264180	-4900	1220	-0.01854796
JUDY							
110/1728	920	4/20/91 17:28				JUDY	
113/1745	-5620	4/23/91 17:45	3.011805556	260220	-6540	920	-0.02513258
JANICE							
110/1845	1110	4/20/91 18:45				JANICE	
113/2022	7720	4/23/91 20:22	3.067361111	265020	6610	1110	0.024941514
SHARYN							
110/2252	1150	4/20/91 22:52				SHARYN	
114/0412	-3920	4/24/91 4:12	3.222222222	278400	-5070	1150	-0.018211207
OPUS							
110/2141	1130	4/20/91 21:41				OPUS	
114/0004	9840	4/24/91 0:04	3.099305556	267780	8710	1130	0.032526701

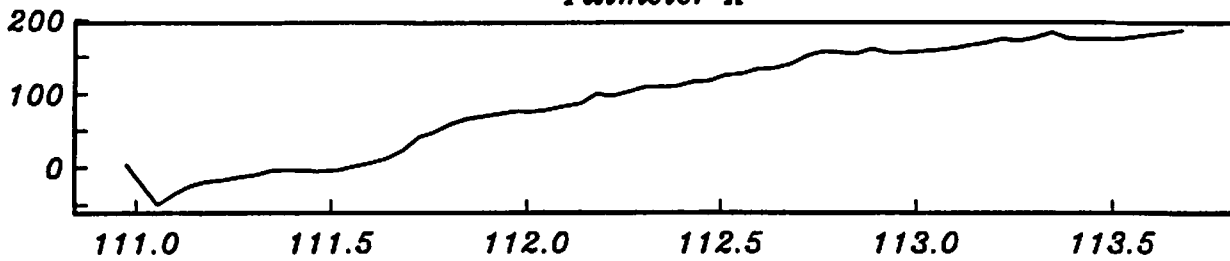
**TERA 01
OBS TIME LOG**

DEPLOYMENT NO. 3

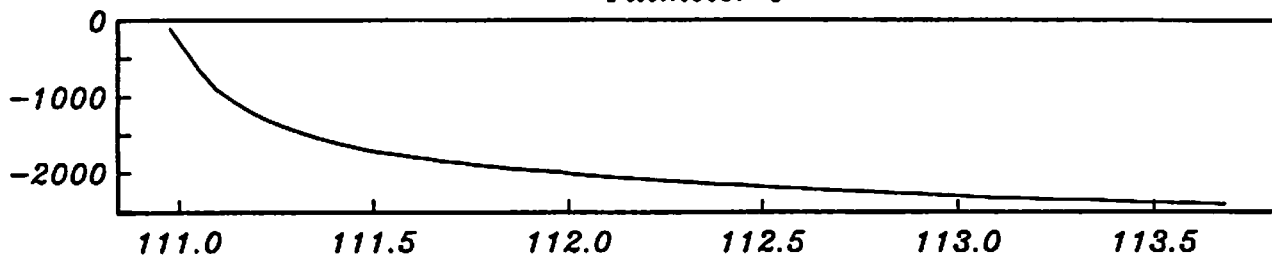
OBS	EVENT	TIME(Z)	OFFSET(μS)
PHRED	Final Clock Set	110/1230	+347
"	Clock Check	110/1932	+1070
"	Clock Check	110/2011	+1100
"	Post Recovery	113/2209	-2780
"	Post Recovery	114/2110	-2790
KAREN	Final Clock Set	110/1804	+1050
"	Clock Check	110/2342	+1140
"	Clock Check	111/0017	+1220
"	Post Recovery	114/0140	-3680
"	Post Recovery	115/1748	-5620
JUDY	Final Clock Set	110/1701	+924
"	Clock Check	110/1728	+920
"	Post Recovery	113/1745	-5620
"	Post Recovery	115/1546	-6860
JANICE	Clock Check	110/1818	+1040
"	Clock Check	110/1845	+1110
"	Post Recovery	113/2022	+7720
"	Post Recovery	114/2155	+10500
SHARYN	Final Clock Set	110/2220	+1130
"	Clock Check	110/2252	+1150
"	Post Recovery	114/0412	-3920
"	Post Recovery	115/1650	-5160
OPUS	Check Clock	110/0418	+8220
"	Final Clock Set	110/2120	+1060
"	Check Clock	110/2141	+1130
"	Post Recovery	114/0004	+9840
"	Post Recovery	114/2020	+11600

Janice Deployment 3

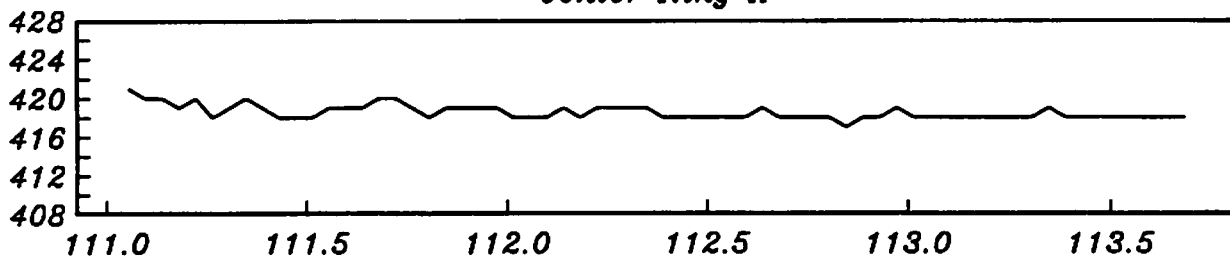
Tiltmeter X



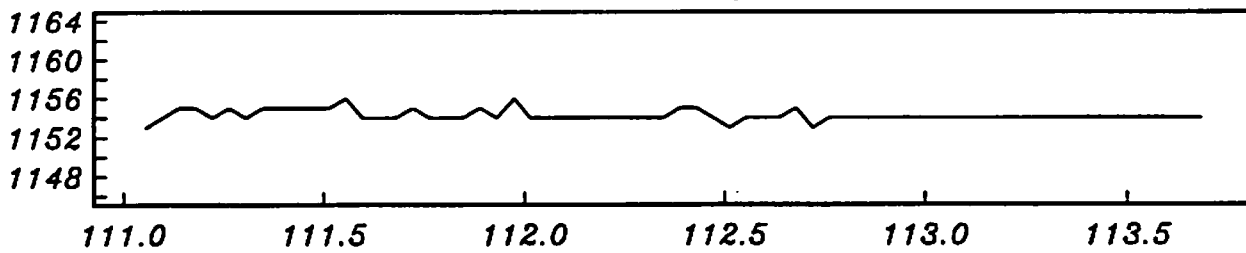
Tiltmeter Y



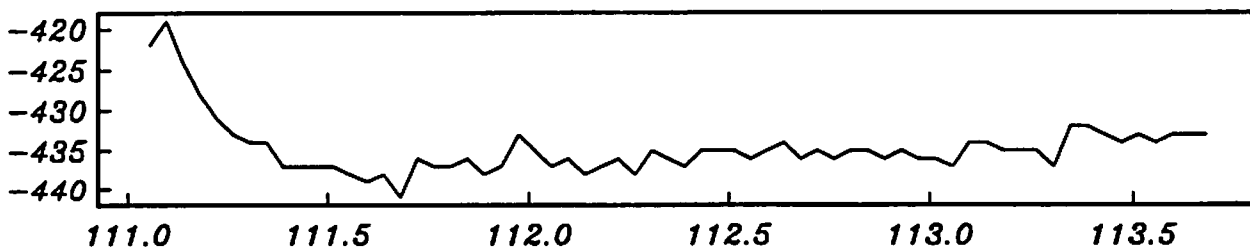
Center Ring X



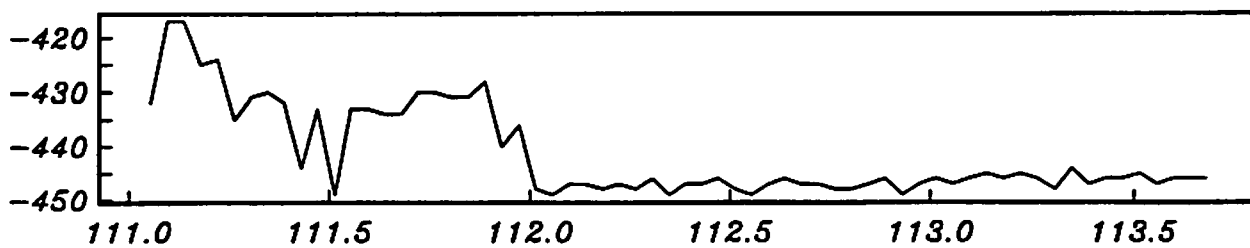
Center Ring Y



Taco Pounder X



Taco Pounder Y



Julian Date

Area 3 Velocity profile

Location: 14° 16.2'S 112° 3.21'W
Date: 20th April 1991 (Julian day 110).

XBT data

Temperature (°C)	Depth (m)
25.0	58.2
24.0	64.8
23.0	89.2
22.0	123.1
21.0	145.9
20.0	163.3
19.0	177.8
18.0	197.8
17.0	209.5
16.0	219.6
15.0	230.3
14.0	245.9
13.0	257.5
12.0	274.6
11.0	293.5
10.0	327.4
9.0	361.6
8.0	429.7

XBT selected points

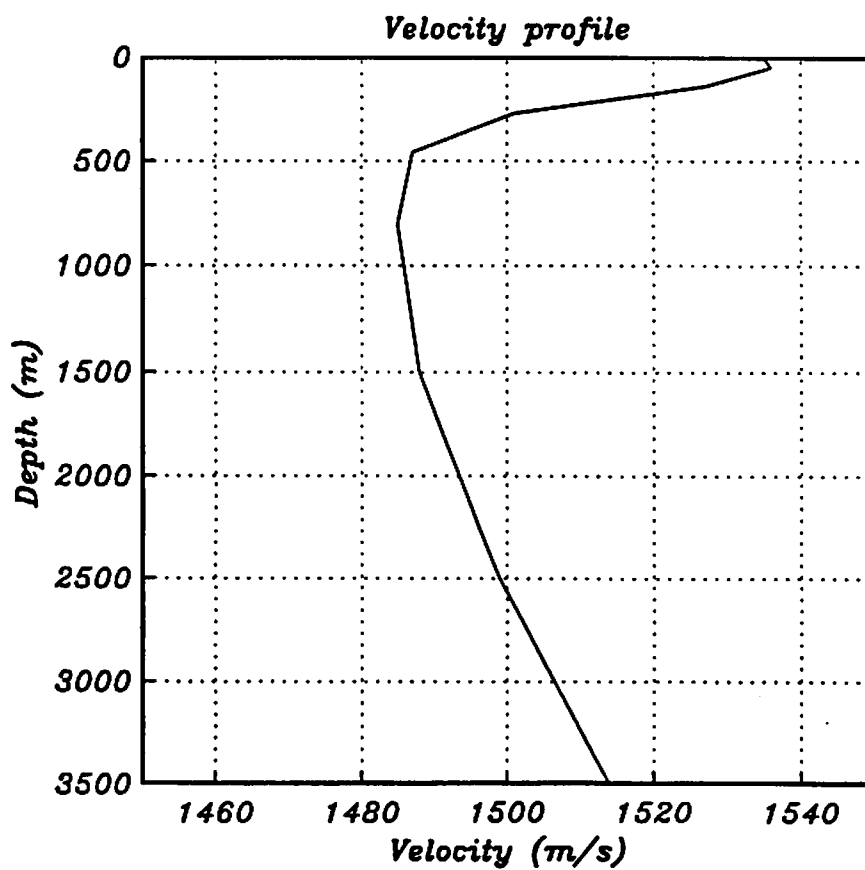
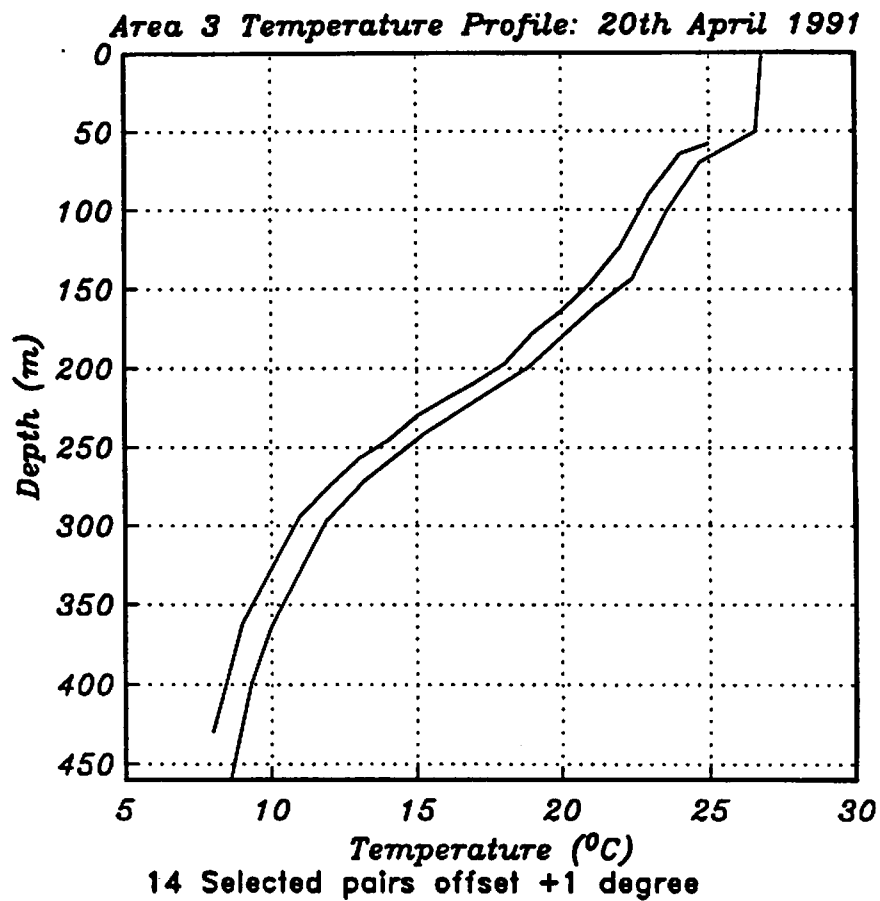
Temperature (°C)	Depth (m)
25.8	2.6
25.6	50.4
23.7	70.3
22.6	100.0
21.4	143.3
20.1	161.7
17.8	200.0
14.2	242.2
12.2	271.2
10.9	296.6
10.8	300.0
9.0	363.8
8.3	400.0
7.6	459.7

Velocity function

Velocity (m/s)	Depth (m)
1535	3
1536	50
1527	143
1501	271
1487	460
1485	800
1488	1500
1499	2500
1514	3500
1589	7500

Notes:

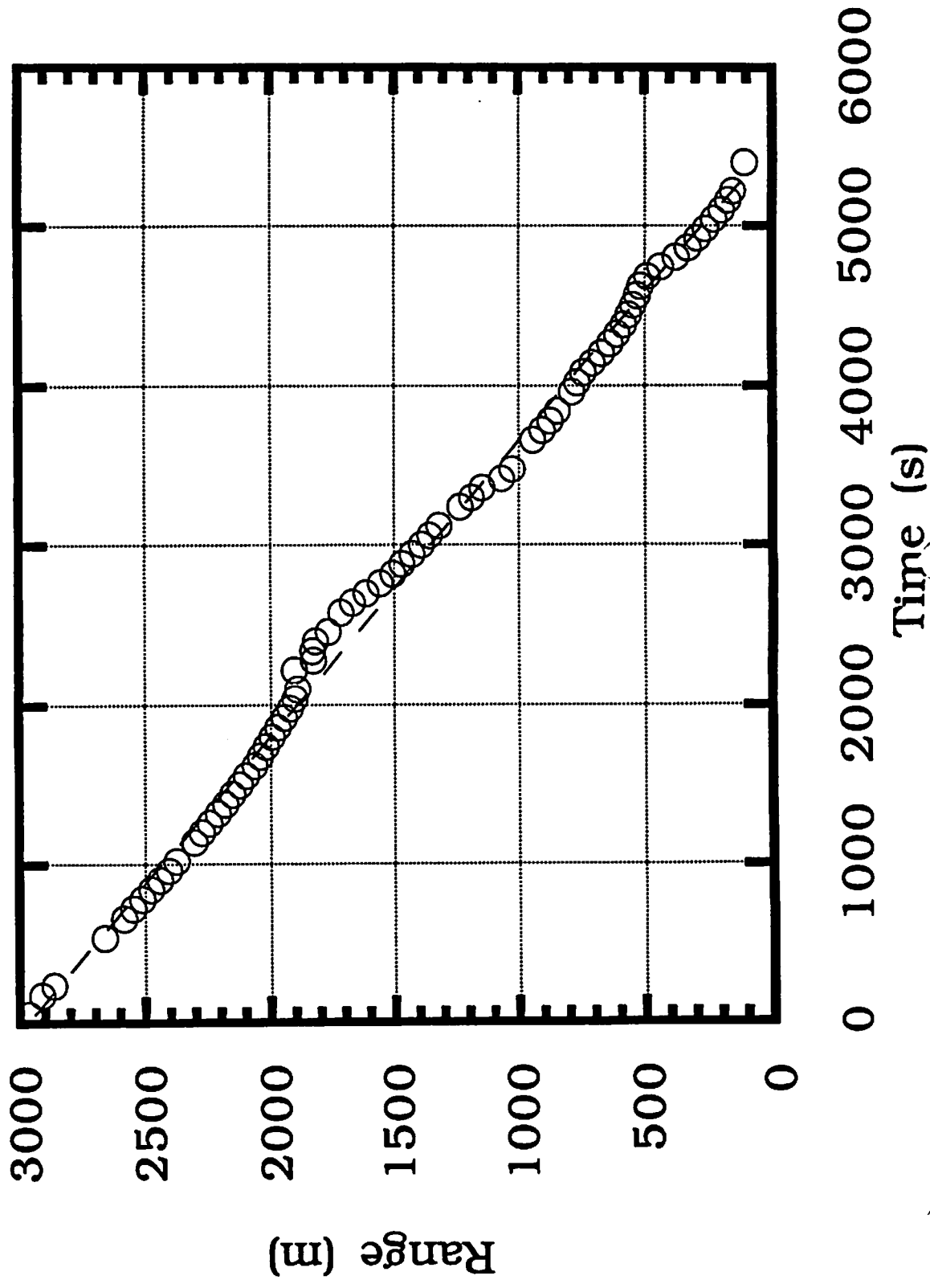
Carter Table Area 57 used at depths of 800m or greater.



Location: 14° 16.25 112° 32.1' W

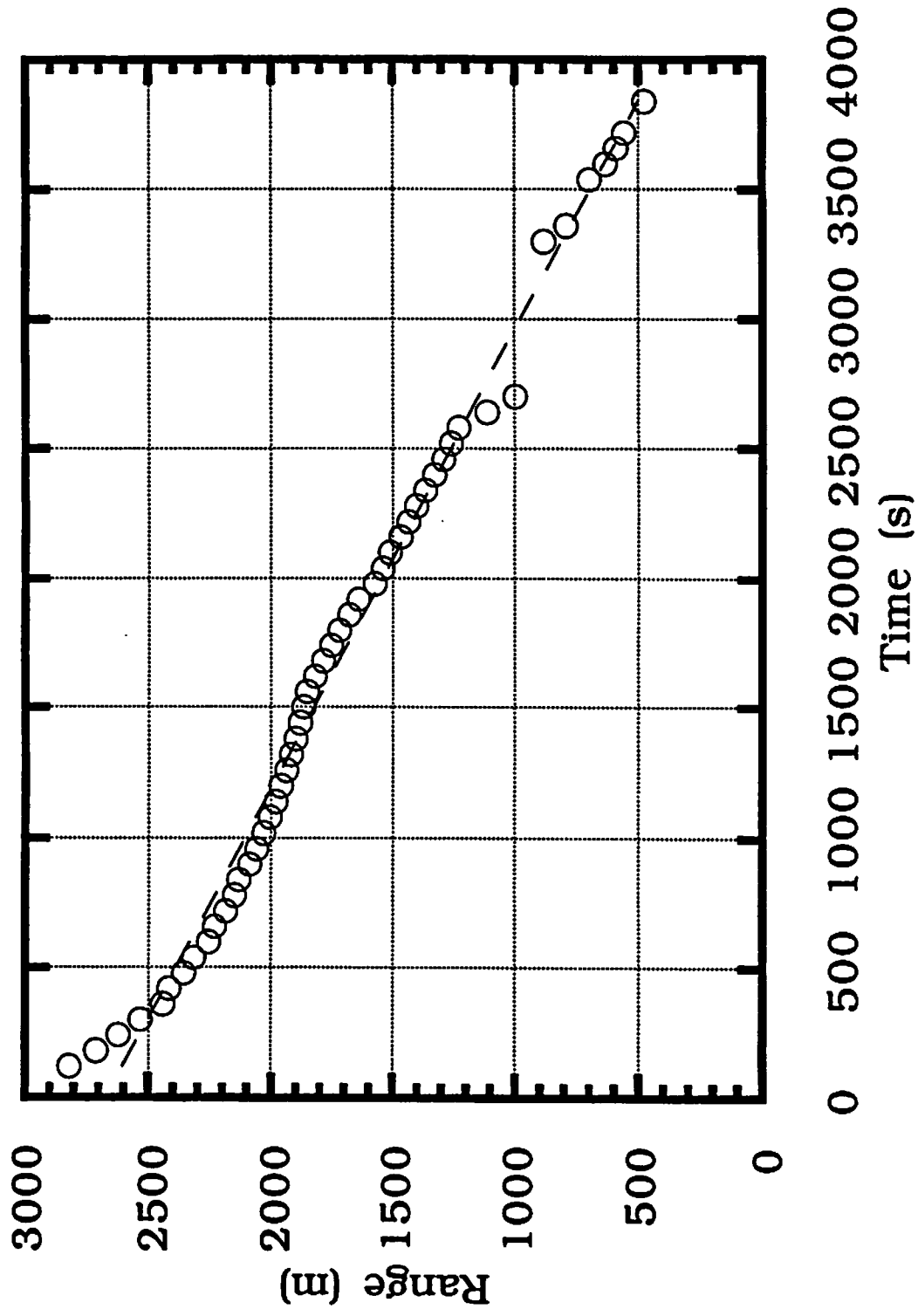
-- $-y = 2973.4 + -0.53931x$ $R = 0.9978$

Janice Drop #3



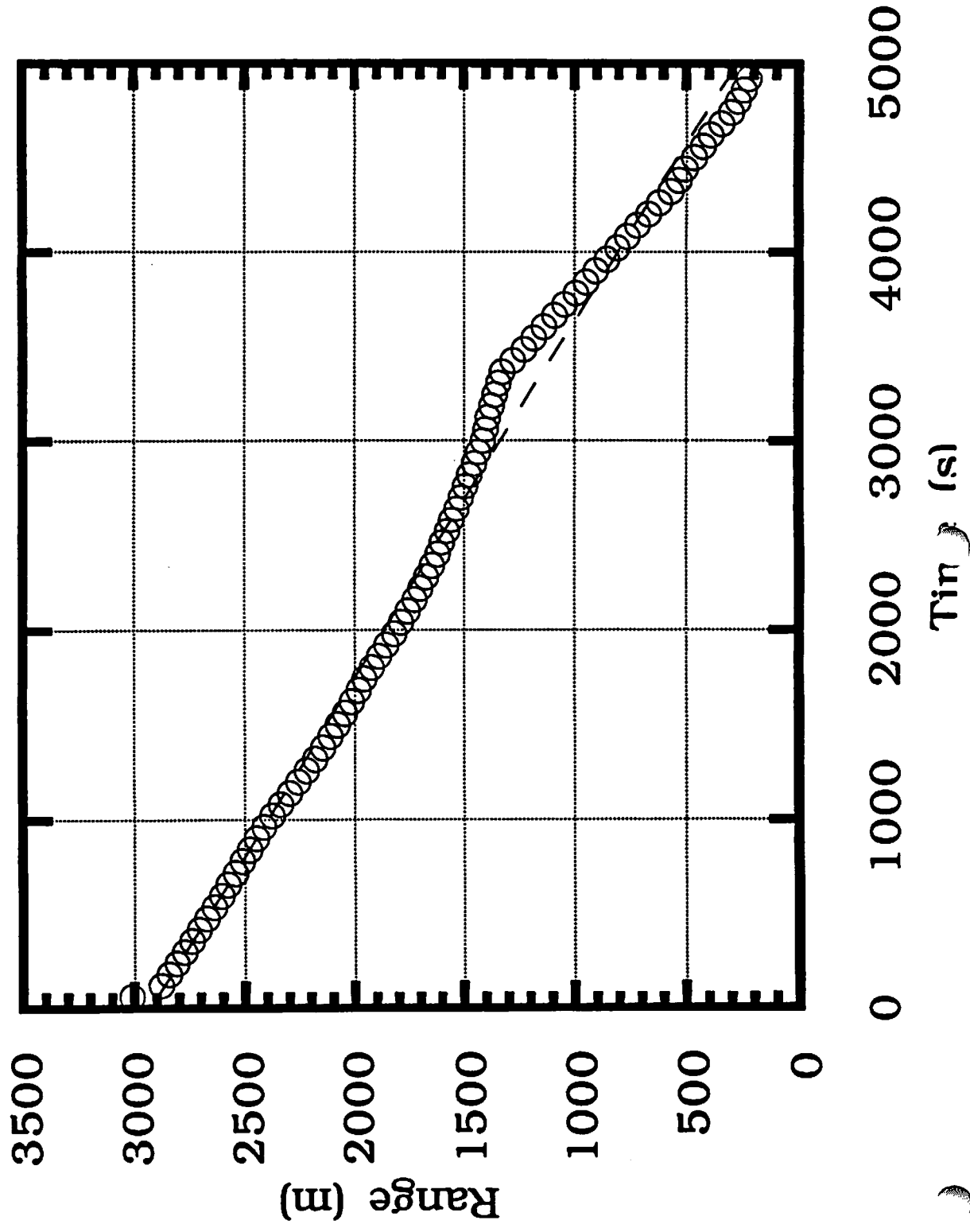
-- $-y = 2673.4 + -0.56482x$ $R = 0.9944$

Judy Drop #3



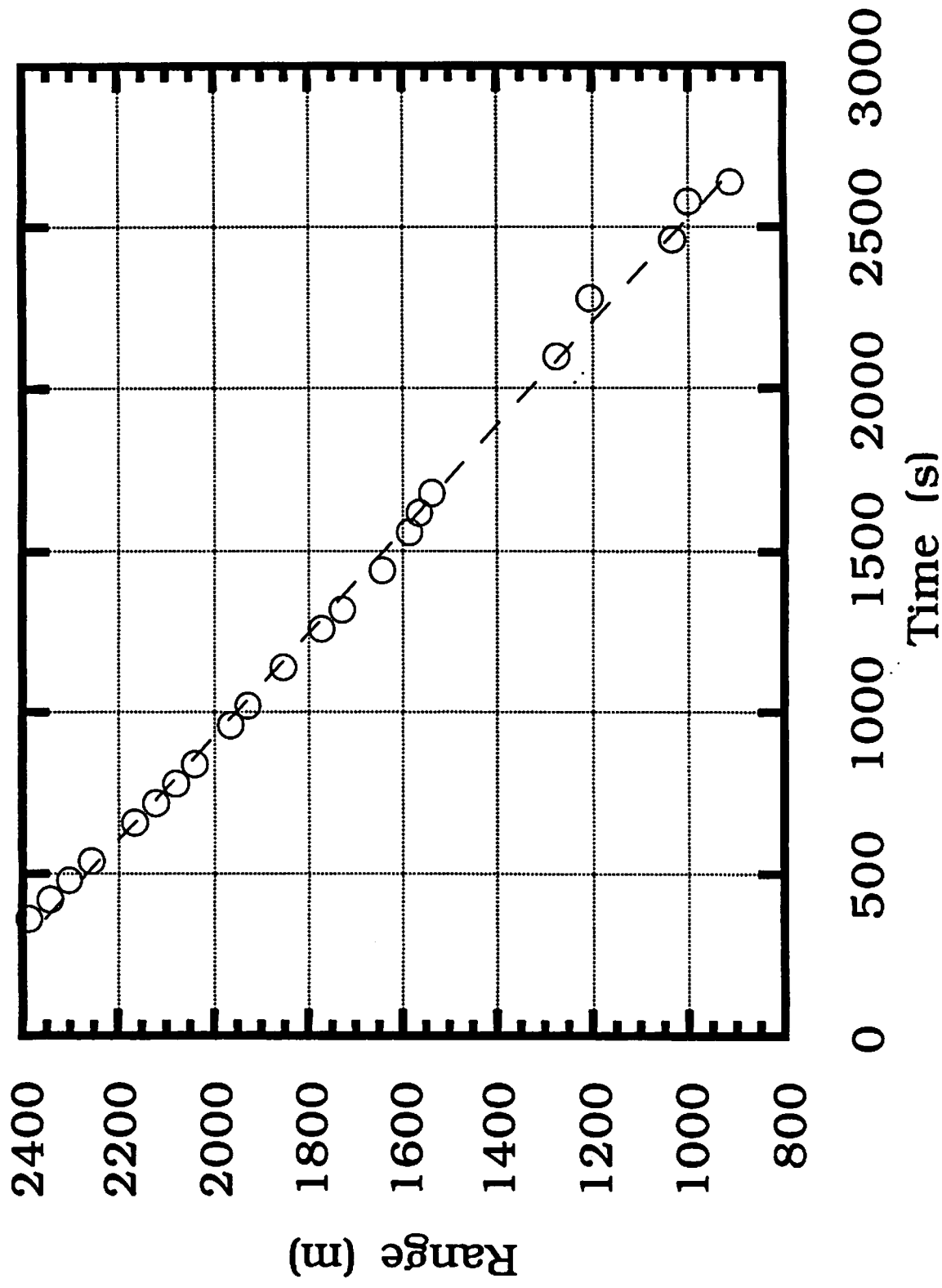
$$---y = 2928 + -0.53034x \quad R = 0.99561$$

Karen Drop #3



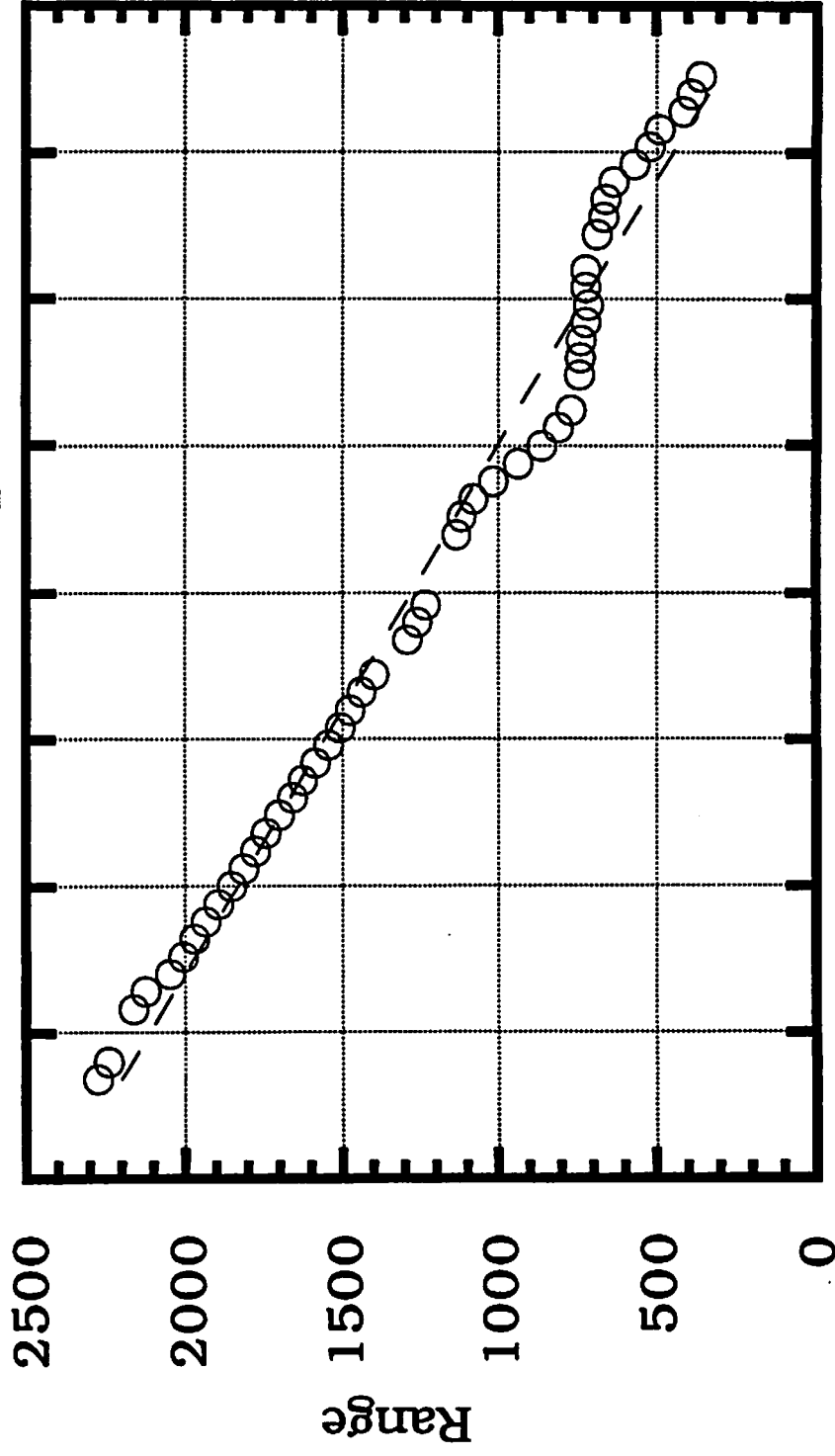
$$---y = 2579.1 + -0.62494x \quad R = 0.99881$$

Opus Drop #3



--- $-y = 2664.4 + -0.55392x$ $R = 0.99186$

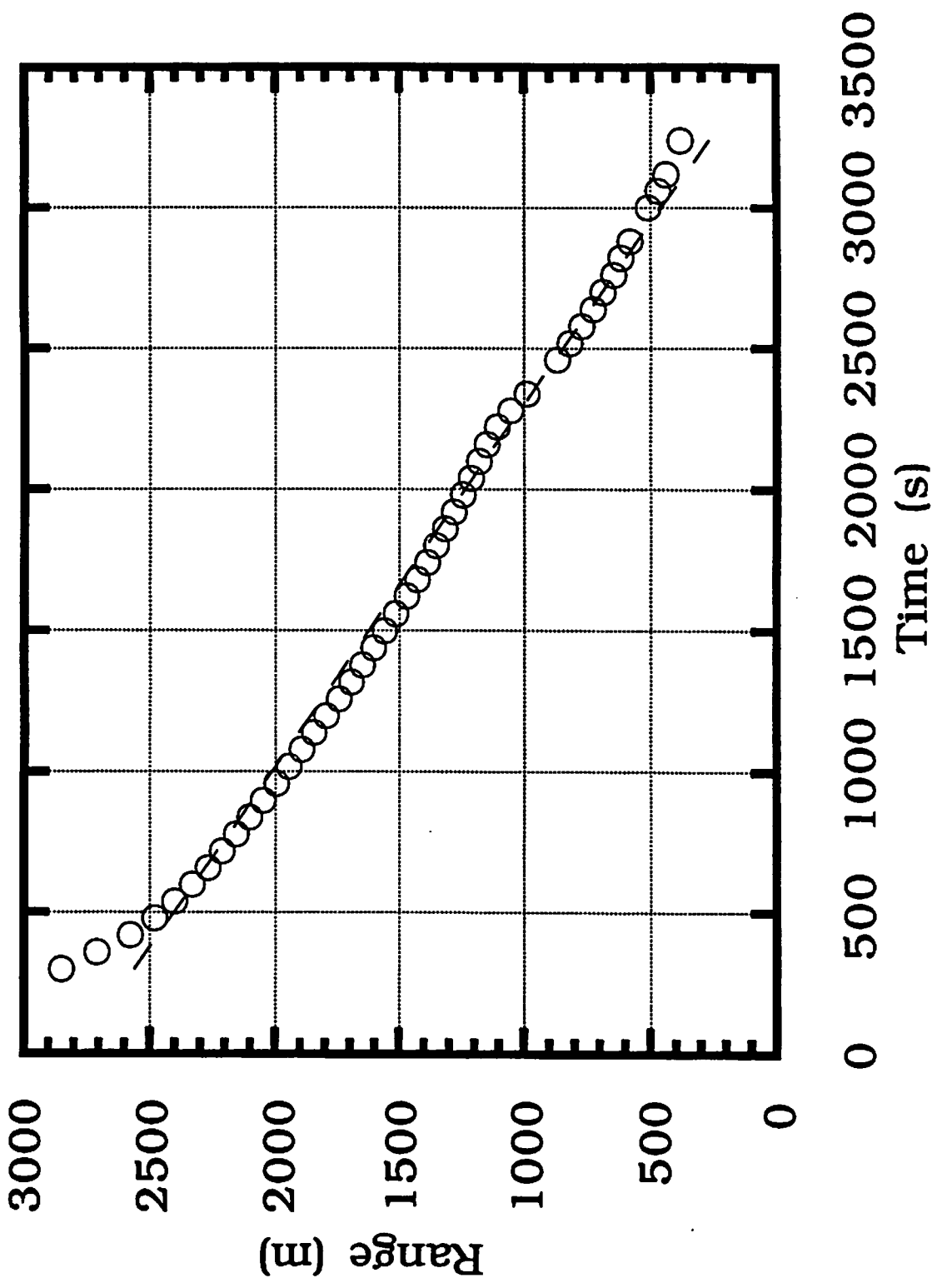
Phred Drop #3

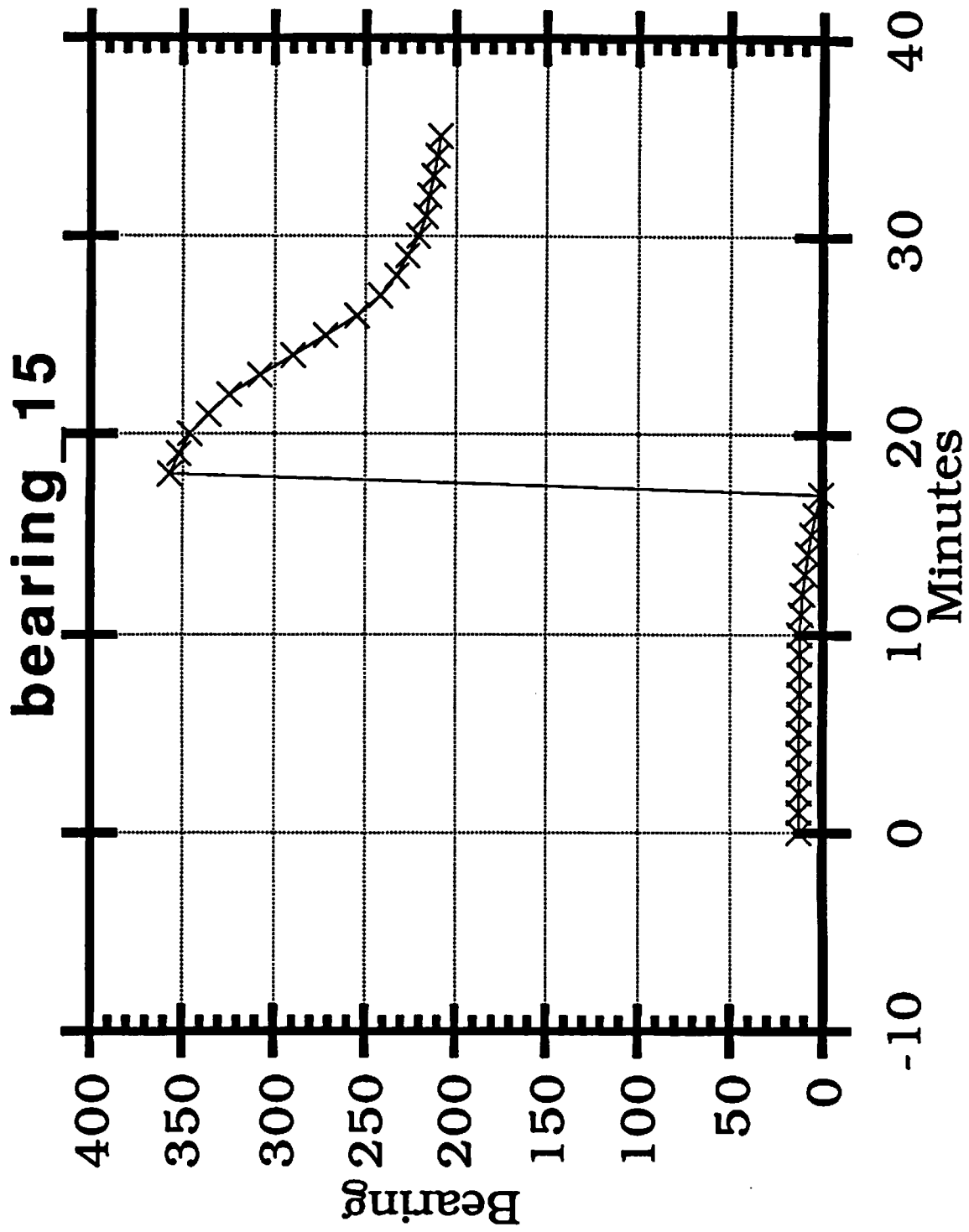


500 1000 1500 2000 2500 3000 3500 4000 4500
Time (s)

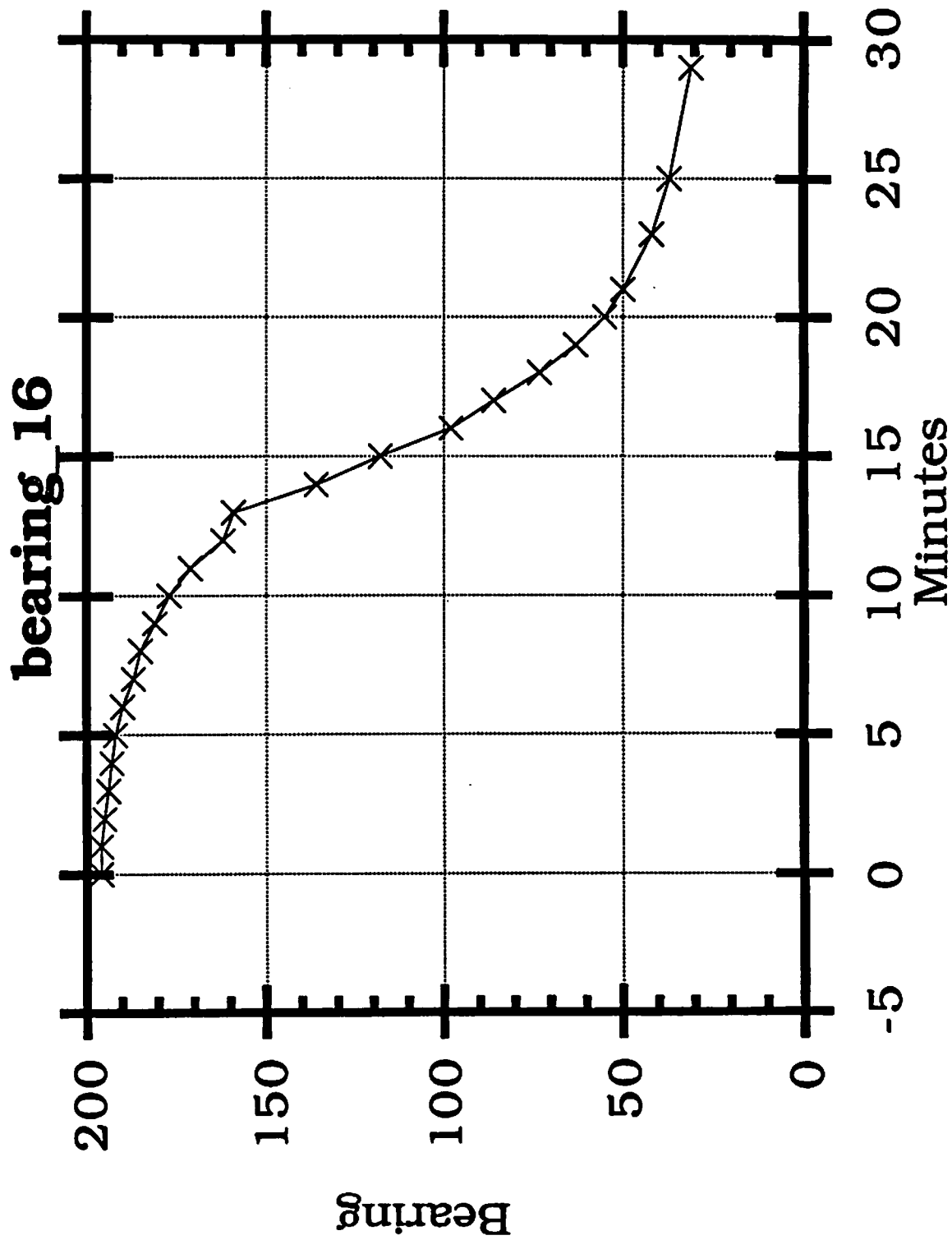
--y = 2793.2 + -0.77858x R= 0.99437

Sharyn Drop #3

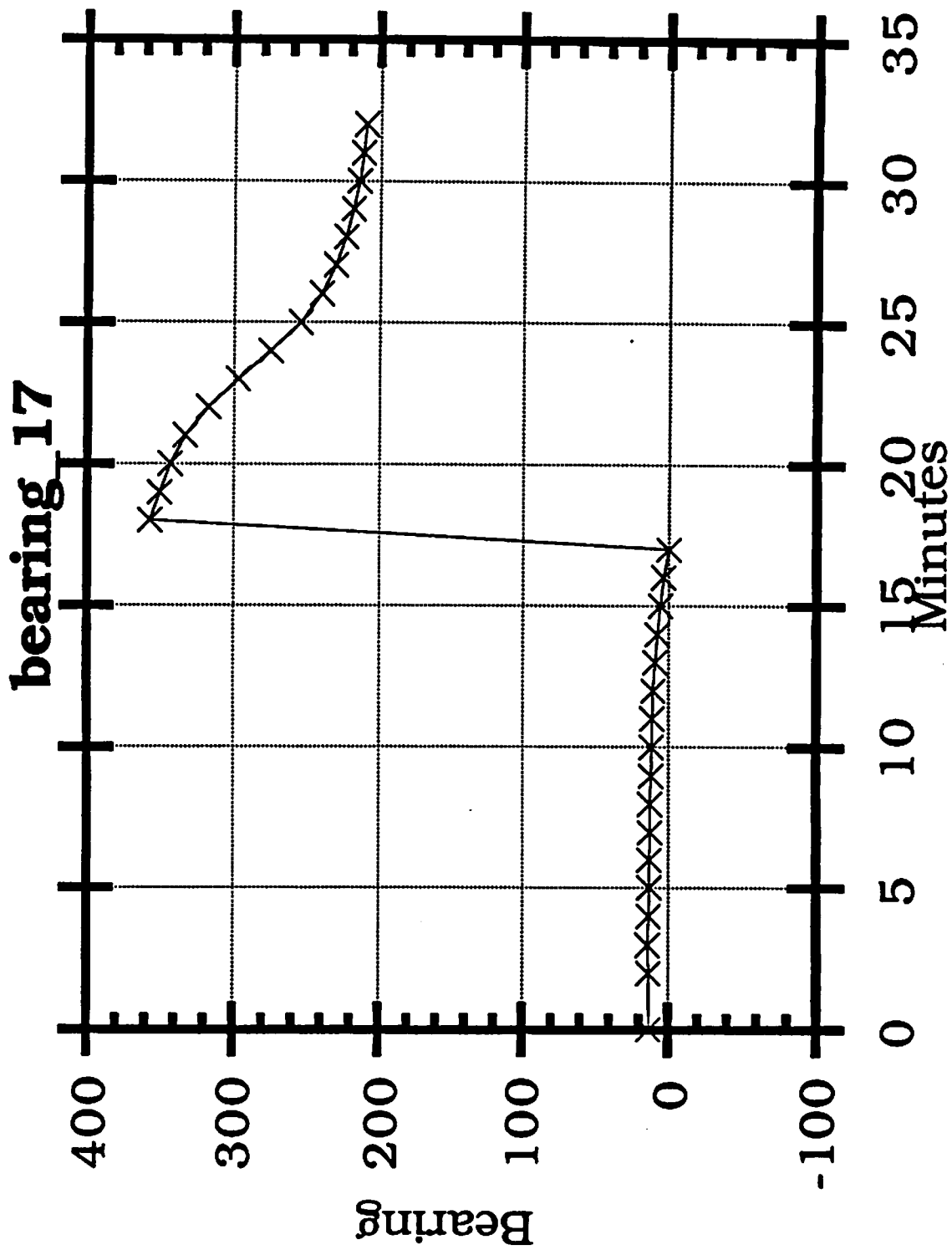




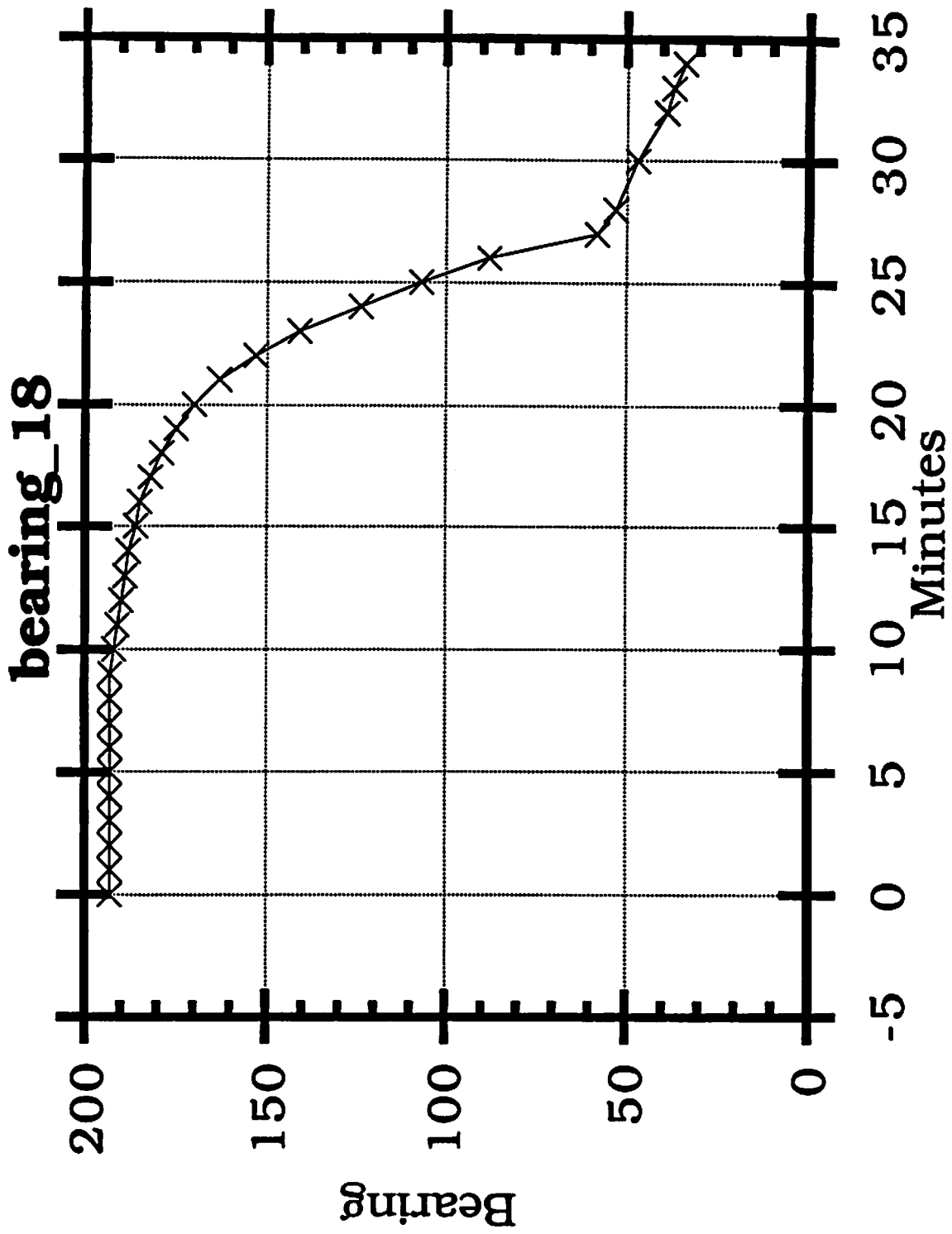
Line 15 Bearings	
GMT (20 April)	Bearings
6:02	13
6:03	13
6:04	12.5
6:05	12.5
6:06	13
6:07	13
6:08	13
6:09	13
6:10	13
6:11	13
6:12	13
6:13	12
6:14	11
6:15	9.5
6:16	8
6:17	6
6:18	4
6:19	1
6:20	357
6:21	352
6:22	346
6:23	336
6:24	324.5
6:25	308
6:26	290
6:27	272
6:28	255
6:29	242
6:30	233
6:31	227
6:32	221
6:33	217
6:34	215
6:35	212.5
6:36	210.5
6:37	209



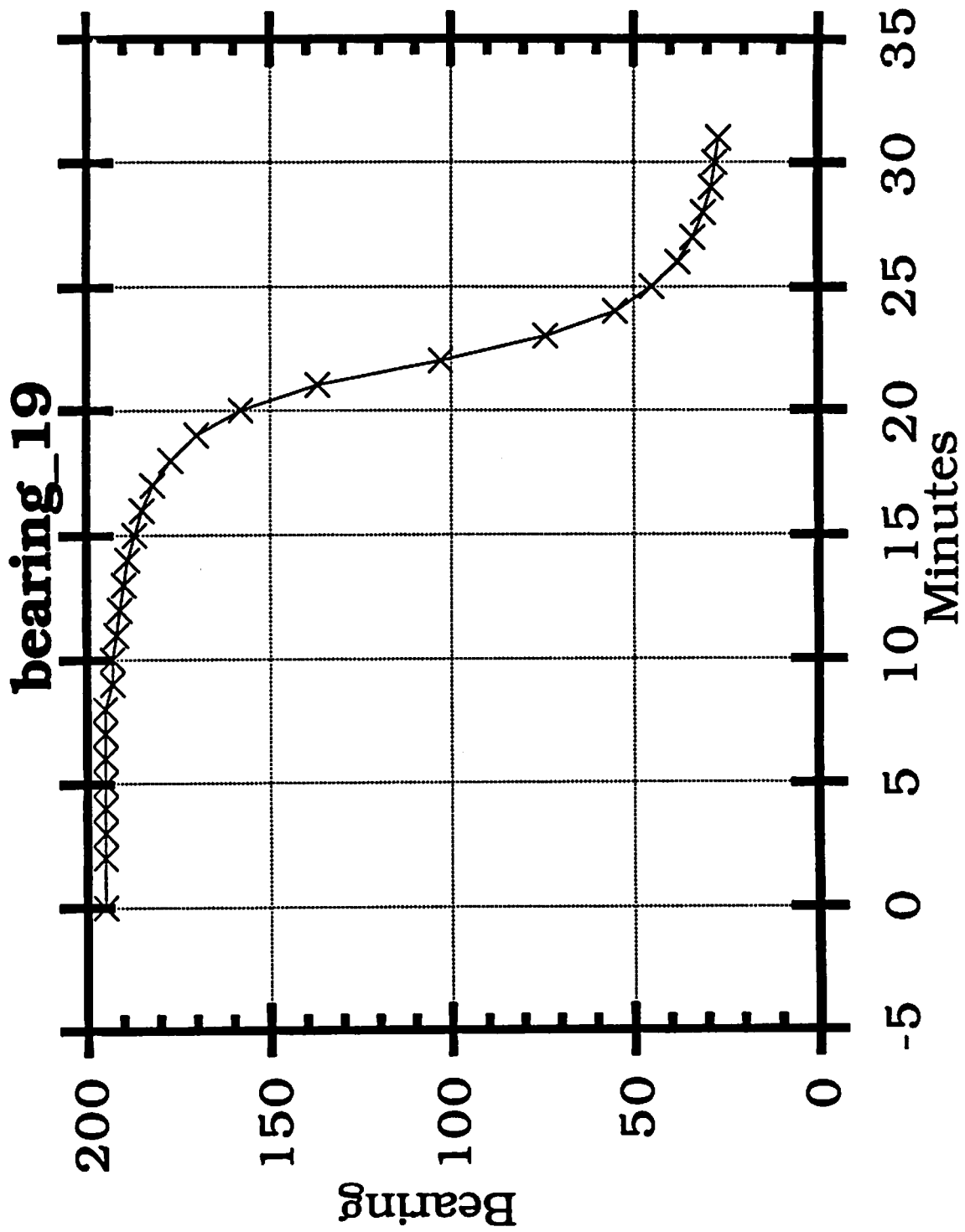
Line 16 Bearings	
GMT (21 April)	Bearings
15:09	196
15:10	196
15:11	195
15:12	194
15:13	193
15:14	192
15:15	190
15:16	187
15:17	185
15:18	181
15:19	177
15:20	171
15:21	162
15:22	159
15:23	136
15:24	118
15:25	98
15:26	86
15:27	73
15:28	63
15:29	55
15:30	50
15:31	
15:32	42
15:33	
15:34	37
15:35	
15:36	
15:37	
15:38	31



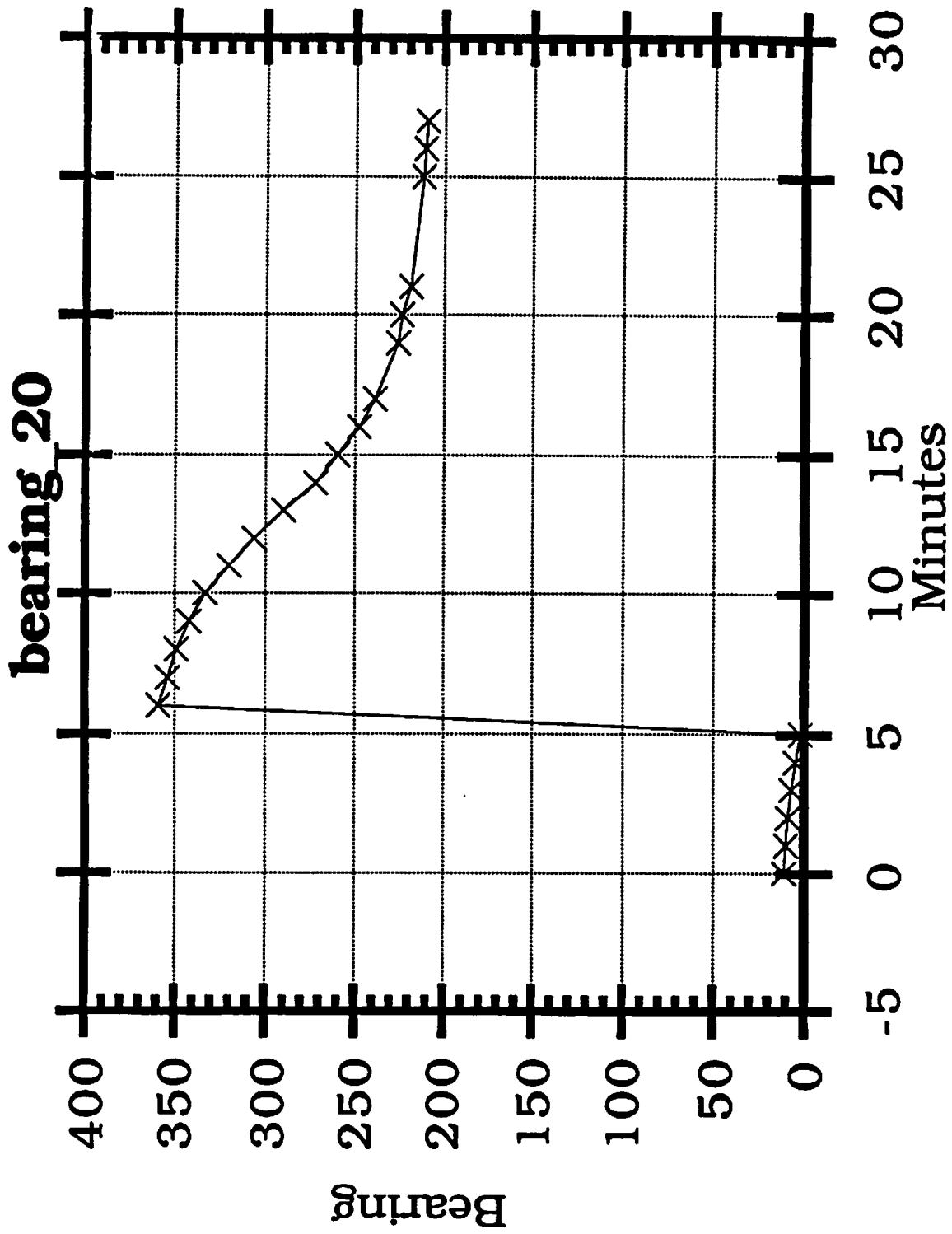
Line 17 Bearings	
GMT (22 April)	Bearings
0:00	13.5
0:01	13.5
0:02	14
0:03	13.5
0:04	13
0:05	13
0:06	12.5
0:07	12.5
0:08	12
0:09	11.5
0:10	11
0:11	10.5
0:12	9
0:13	7.5
0:14	5.5
0:15	3.5
0:16	0
0:17	357
0:18	350.5
0:19	343
0:20	333
0:21	317
0:22	297
0:23	275
0:24	254.5
0:25	240
0:26	230.5
0:27	223.5
0:28	218.5
0:29	214.5
0:30	212
0:31	210



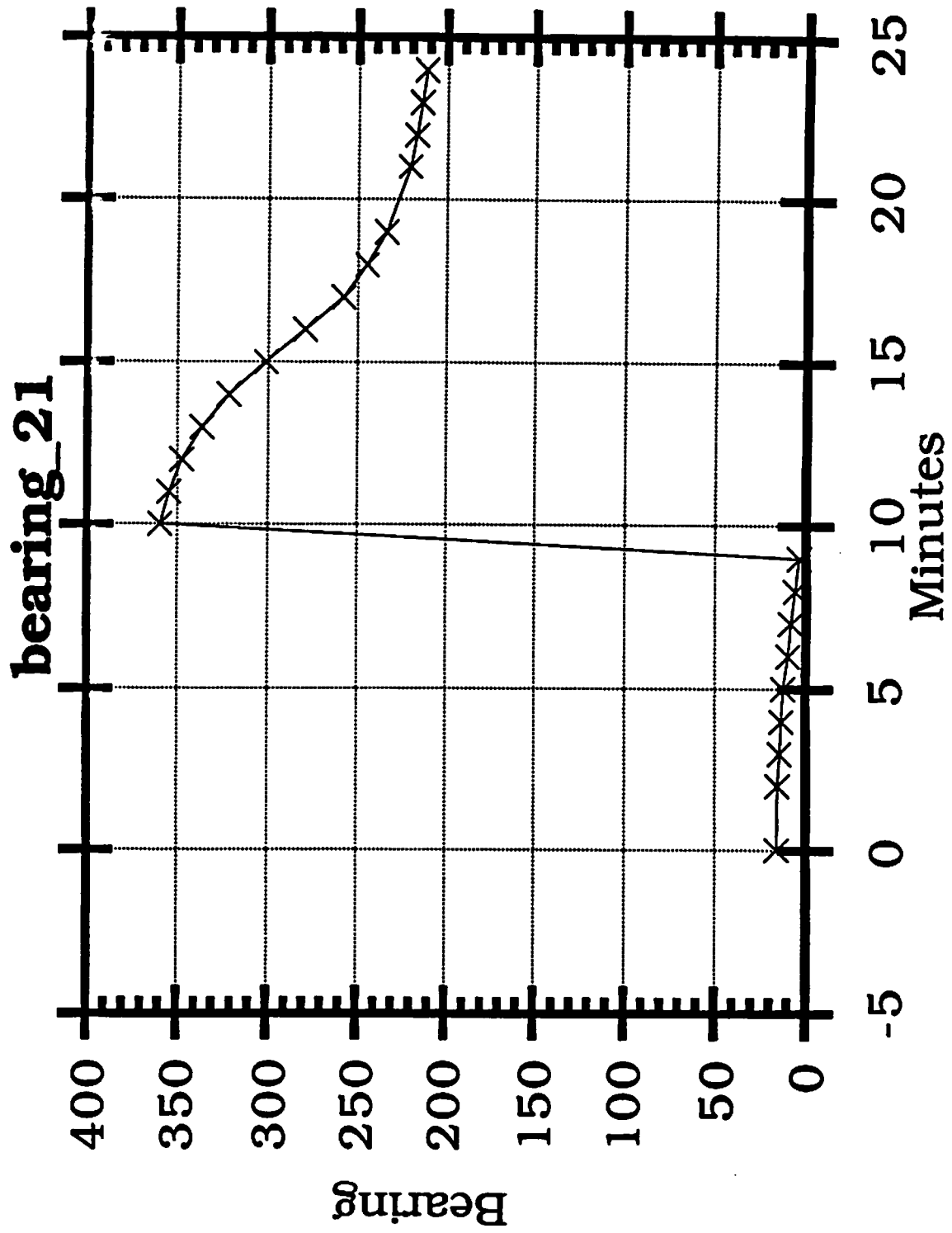
Line 18 Bearings	
GMT (22 April)	Bearings
6:56	193
6:57	193
6:58	193
6:59	193
7:00	193
7:01	193
7:02	193
7:03	193
7:04	193
7:05	193
7:06	192
7:07	191
7:08	190
7:09	189
7:10	188
7:11	186
7:12	185
7:13	182
7:14	179
7:15	175
7:16	170
7:17	163
7:18	153
7:19	141
7:20	124
7:21	107
7:22	88
7:23	58
7:24	53
7:25	
7:26	47
7:27	
7:28	39
7:29	37
7:30	34



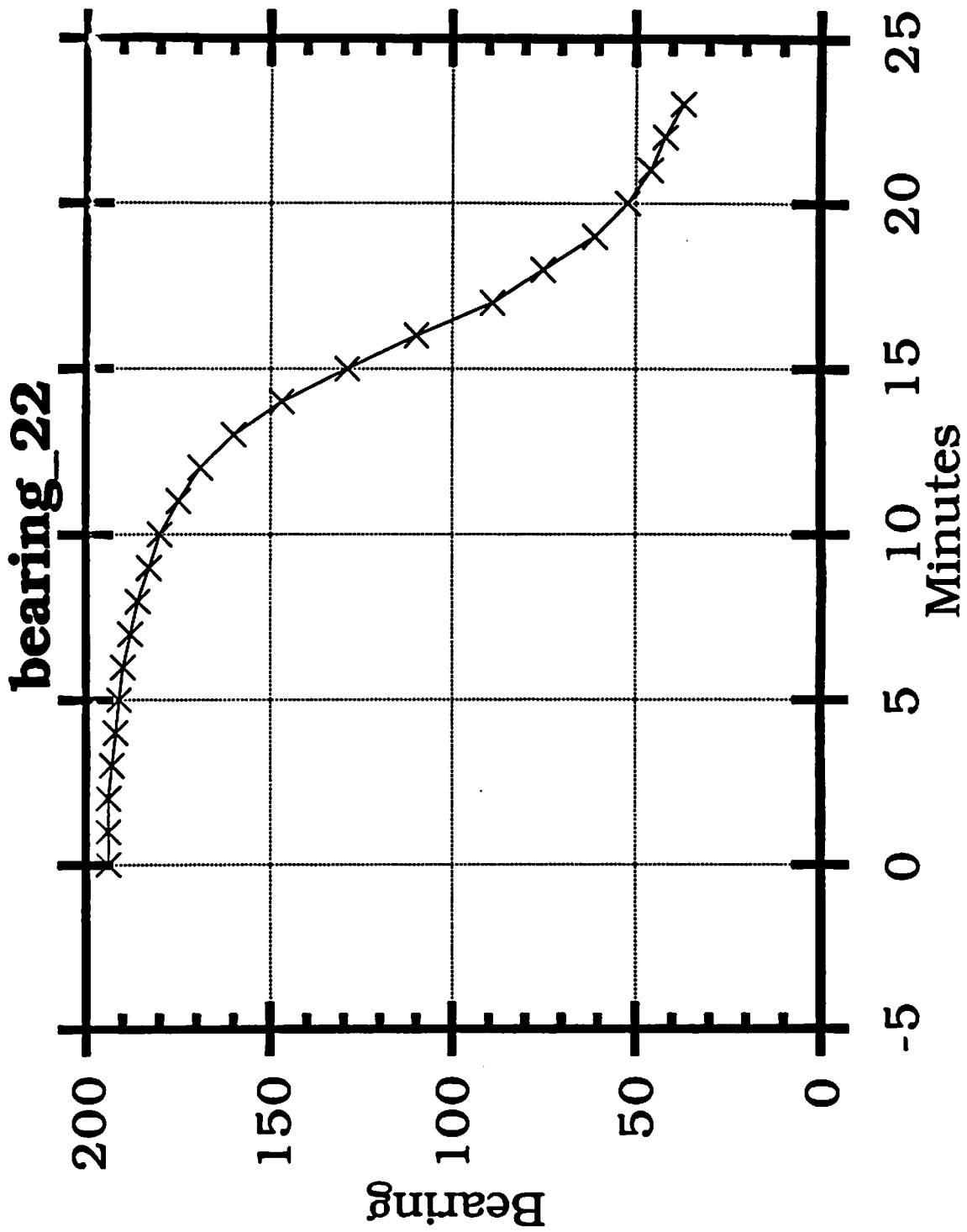
Line 19 Bearings	
GMT (22 April)	Bearings
18:33	195
18:34	
18:35	195
18:36	195
18:37	195
18:38	195
18:39	195
18:40	195
18:41	195
18:42	193
18:43	193
18:44	192
18:45	191
18:46	190
18:47	189
18:48	187
18:49	185
18:50	182
18:51	177
18:52	170
18:53	158
18:54	137
18:55	103
18:56	74
18:57	55
18:58	45
18:59	38
19:00	34
19:01	31
19:02	29
19:03	28
19:04	27



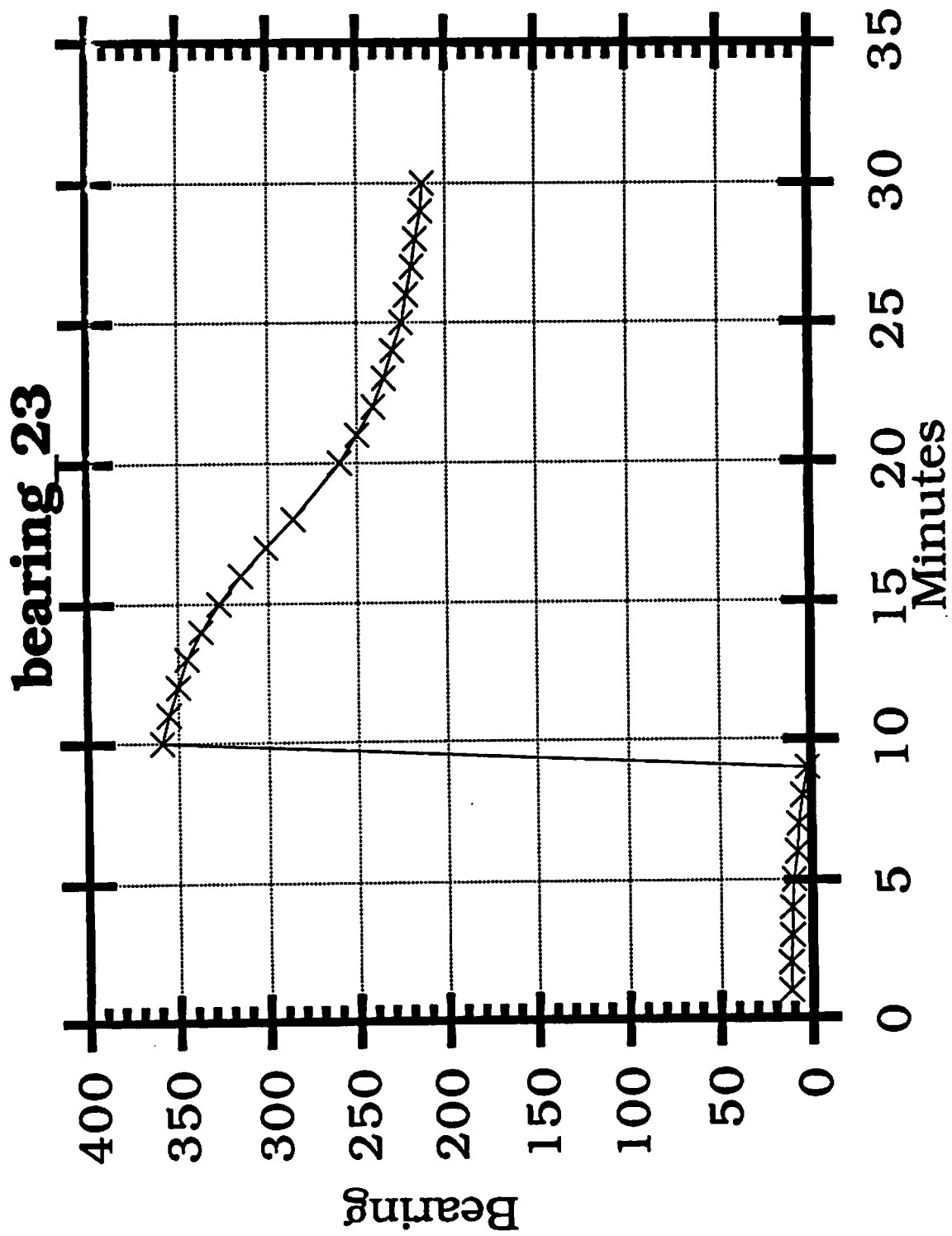
Line 20 Bearings	
GMT (22 April)	Bearings
13:11	11
13:12	
13:13	9
13:14	7
13:15	5
13:16	2
13:17	359
13:18	354
13:19	349
13:20	342
13:21	333
13:22	320
13:23	306
13:24	290
13:25	272
13:26	260
13:27	248
13:28	239
13:29	
13:30	226
13:31	224
13:32	219
13:33	
13:34	
13:35	
13:36	212
13:37	211
13:38	210



Line 21 Bearings	
GMT (23 April)	Bearings
1:30	16
1:31	
1:32	15.5
1:33	14.5
1:34	13.5
1:35	12.5
1:36	10
1:37	8.5
1:38	6
1:39	3.5
1:40	359.5
1:41	354.5
1:42	347.5
1:43	336.5
1:44	321.5
1:45	301
1:46	279.5
1:47	258
1:48	245
1:49	234
1:50	
1:51	221
1:52	217.5
1:53	214.5
1:54	212



Line 22 Bearings	
GMT (23 April)	Bearings
8:26	194
8:27	194
8:28	194
8:29	193
8:30	192
8:31	191
8:32	190
8:33	188
8:34	186
8:35	183
8:36	180
8:37	175
8:38	169
8:39	160
8:40	147
8:41	129
8:42	110
8:43	89
8:44	75
8:45	61
8:46	52
8:47	46
8:48	42
8:49	37



Line 23 Bearings	
GMT (23 April)	Bearings
11:31	12
11:32	12
11:33	12
11:34	11
11:35	11
11:36	10
11:37	8
11:38	7
11:39	5
11:40	2
11:41	359
11:42	355
11:43	350
11:44	345
11:45	337
11:46	327
11:47	315
11:48	301
11:49	286
11:50	
11:51	260
11:52	250
11:53	241
11:54	235
11:55	230
11:56	225
11:57	222
11:58	219
11:59	217
12:00	214
12:01	213

ESP 17 Airgun Shots

21:23		22:11		22:59	
21:24		22:12		23:00	
21:25		22:13		23:01	
21:26		22:14		23:02	
21:27		22:15		23:03	
21:28		22:16		23:04	
21:29		22:17		23:05	
21:30		22:18		23:06	
21:31		22:19		23:07	
21:32		22:20		23:08	
21:33		22:21		23:09	
21:34		22:22		23:10	
21:35		22:23		23:11	
21:36		22:24		23:12	
21:37		22:25		23:13	
21:38		22:26		23:14	
21:39		22:27		23:15	
21:40		22:28		23:16	
21:41		22:29		23:17	
21:42		22:30		23:18	
21:43		22:31		23:19	
21:44		22:32		23:20	
21:45		22:33		23:21	
21:46		22:34		23:22	
21:47		22:35		23:23	
21:48		22:36		23:24	
21:49		22:37		23:25	
21:50		22:38		23:26	
21:51		22:39		23:27	
21:52		22:40		23:28	
21:53		22:41		23:29	
21:54		22:42		23:30	
21:55		22:43		23:31	
21:56		22:44		23:32	
21:57		22:45		23:33	
21:58		22:46		23:34	
21:59		22:47		23:35	
22:00		22:48		23:36	
22:01		22:49		23:37	
22:02		22:50		23:38	
22:03		22:51		23:39	
22:04		22:52		23:40	
22:05		22:53		23:41	
22:06		22:54		23:42	
22:07		22:55		23:43	
22:08		22:56		23:44	
22:09		22:57		23:45	
22:10		22:58		23:46	

ESP 17 Airgun Shots

23:47		0:35		1:23	
23:48		0:36		1:24	
23:49		0:37		1:25	
23:50		0:38		1:26	
23:51		0:39		1:27	
23:52		0:40		1:28	
23:53		0:41		1:29	
23:54		0:42		1:30	
23:55		0:43		1:31	
23:56		0:44		1:32	
23:57		0:45		1:33	
23:58		0:46		1:34	
23:59		0:47		1:35	
0:00		0:48		1:36	
0:01		0:49		1:37	
0:02		0:50		1:38	
0:03		0:51		1:39	
0:04		0:52		1:40	
0:05		0:53		1:41	
0:06		0:54		1:42	
0:07		0:55		1:43	
0:08		0:56		1:44	
0:09		0:57		1:45	
0:10		0:58		1:46	
0:11		0:59		1:47	
0:12		1:00		1:48	
0:13		1:01		1:49	
0:14		1:02		1:50	
0:15		1:03		1:51	
0:16		1:04		1:52	
0:17		1:05		1:53	
0:18		1:06		1:54	
0:19		1:07		1:55	
0:20		1:08		1:56	
0:21		1:09		1:57	
0:22		1:10		1:58	
0:23		1:11		1:59	
0:24		1:12		2:00	
0:25		1:13		2:01	
0:26		1:14		2:02	
0:27		1:15		2:03	
0:28		1:16		2:04	
0:29		1:17		2:05	
0:30		1:18		2:06	
0:31		1:19		2:07	
0:32		1:20		2:08	
0:33		1:21		2:09	
0:34		1:22		2:10	

ESP 17 Airgun Shots

2:11		2:59	
2:12		3:00	
2:13		3:01	
2:14		3:02	
2:15		3:03	
2:16		3:04	
2:17		3:05	
2:18		3:06	
2:19		3:07	
2:20		3:08	
2:21		3:09	
2:22		3:10	
2:23		3:11	
2:24		3:12	
2:25		3:13	
2:26		3:14	
2:27		3:15	
2:28		3:16	
2:29		3:17	
2:30		3:18	
2:31		3:19	
2:32		3:20	
2:33		3:21	
2:34		3:22	
2:35		3:23	
2:36		3:24	
2:37		3:25	
2:38		3:26	
2:39		3:27	
2:40			
2:41			
2:42			
2:43			
2:44			
2:45			
2:46			
2:47			
2:48			
2:49			
2:50			
2:51			
2:52			
2:53			
2:54			
2:55			
2:56			
2:57			
2:58			

ESP 18 Airgun Shots

4:54	2ms late	5:42	6:30
4:55		5:43	6:31
4:56		5:44	6:32
4:57		5:45	6:33
4:58		5:46	6:34
4:59		5:47	6:35
5:00		5:48	6:36
5:01		5:49	6:37
5:02		5:50	6:38
5:03		5:51	6:39
5:04		5:52	6:40
5:05		5:53	6:41
5:06		5:54	6:42
5:07		5:55	6:43
5:08		5:56	6:44
5:09		5:57	6:45
5:10		5:58	6:46
5:11		5:59	6:47
5:12		6:00	6:48
5:13		6:01	6:49
5:14	?	6:02	6:50
5:15		6:03	6:51
5:16		6:04	6:52
5:17		6:05	6:53
5:18		6:06	6:54
5:19		6:07	6:55
5:20		6:08	6:56
5:21		6:09	6:57
5:22		6:10	6:58
5:23		6:11	6:59
5:24		6:12	7:00
5:25		6:13	7:01
5:26		6:14	7:02
5:27		6:15	7:03
5:28		6:16	7:04
5:29	?	6:17	7:05
5:30		6:18	7:06
5:31		6:19	7:07
5:32		6:20	7:08
5:33		6:21	7:09
5:34		6:22	7:10
5:35		6:23	7:11
5:36		6:24	7:12
5:37		6:25	7:13
5:38		6:26	7:14
5:39		6:27	7:15
5:40		6:28	7:16
5:41		6:29	7:17

ESP 18 Airgun Shots

7:18		8:06		8:54	
7:19		8:07		8:55	
7:20		8:08		8:56	
7:21		8:09		8:57	
7:22		8:10		8:58	
7:23		8:11		8:59	
7:24		8:12		9:00	
7:25		8:13		9:01	
7:26		8:14		9:02	
7:27		8:15		9:03	
7:28		8:16		9:04	
7:29		8:17		9:05	
7:30		8:18		9:06	
7:31		8:19		9:07	
7:32		8:20		9:08	
7:33		8:21		9:09	
7:34		8:22		9:10	
7:35		8:23		9:11	
7:36		8:24		9:12	
7:37		8:25		9:13	
7:38		8:26		9:14	
7:39		8:27		9:15	
7:40		8:28		9:16	
7:41		8:29		9:17	
7:42		8:30		9:18	
7:43		8:31		9:19	
7:44		8:32		9:20	
7:45		8:33		9:21	
7:46		8:34		9:22	
7:47		8:35		9:23	
7:48		8:36		9:24	
7:49		8:37		9:25	
7:50		8:38		9:26	
7:51		8:39		9:27	
7:52		8:40		9:28	
7:53		8:41		9:29	
7:54		8:42		9:30	
7:55		8:43		9:31	
7:56		8:44		9:32	
7:57		8:45		9:33	
7:58		8:46		9:34	
7:59		8:47		9:35	
8:00		8:48		9:36	
8:01		8:49		9:37	
8:02		8:50		9:38	
8:03		8:51		9:39	
8:04		8:52		9:40	
8:05		8:53		9:41	

ESP 18 Airgun Shots

9:42	
9:43	
9:44	
9:45	
9:46	
9:47	
9:48	
9:49	
9:50	
9:51	
9:52	
9:53	
9:54	
9:55	
9:56	

ESP 19 Airgun Shots

17:34		18:22		19:10	
17:35		18:23		19:11	
17:36		18:24		19:12	
17:37		18:25		19:13	
17:38		18:26		19:14	
17:39		18:27		19:15	
17:40		18:28		19:16	
17:41		18:29		19:17	
17:42		18:30		19:18	
17:43		18:31		19:19	
17:44		18:32		19:20	
17:45		18:33		19:21	
17:46		18:34		19:22	
17:47		18:35		19:23	
17:48		18:36		19:24	
17:49		18:37		19:25	
17:50		18:38		19:26	
17:51		18:39		19:27	
17:52		18:40		19:28	
17:53		18:41		19:29	
17:54		18:42		19:30	
17:55		18:43		19:31	
17:56		18:44		19:32	
17:57		18:45		19:33	
17:58		18:46		19:34	
17:59		18:47		19:35	
18:00		18:48		19:36	
18:01		18:49		19:37	
18:02		18:50		19:38	
18:03		18:51		19:39	
18:04		18:52		19:40	
18:05		18:53		19:41	
18:06		18:54		19:42	
18:07		18:55		19:43	
18:08		18:56		19:44	
18:09		18:57		19:45	
18:10		18:58		19:46	
18:11		18:59		19:47	
18:12		19:00		19:48	
18:13		19:01		19:49	
18:14		19:02		19:50	
18:15		19:03		19:51	
18:16		19:04		19:52	
18:17		19:05		19:53	
18:18		19:06		19:54	
18:19		19:07		19:55	
18:20		19:08		19:56	
18:21		19:09		19:57	

ESP 19 Airgun Shots

19:58	
19:59	
20:00	
20:01	
20:02	
20:03	
20:04	
20:05	
20:06	
20:07	
20:08	
20:09	
20:10	
20:11	
20:12	
20:13	
20:14	
20:15	
20:16	
20:17	
20:18	
20:19	
20:20	
20:21	
20:22	
20:23	
20:24	
20:25	
20:26	
20:27	
20:28	
20:29	
20:30	
20:31	
20:32	
20:33	
20:34	
20:35	
20:36	
20:37	

ESP 20 Airgun Shots

11:11		11:59		12:47	
11:12		12:00		12:48	
11:13		12:01		12:49	
11:14		12:02		12:50	
11:15		12:03		12:51	
11:16		12:04		12:52	
11:17		12:05		12:53	
11:18		12:06		12:54	
11:19		12:07		12:55	
11:20		12:08		12:56	
11:21		12:09		12:57	
11:22		12:10		12:58	
11:23		12:11		12:59	
11:24		12:12		13:00	
11:25		12:13		13:01	
11:26		12:14		13:02	
11:27		12:15		13:03	
11:28	Xtra @ 28:23	12:16		13:04	
11:29		12:17		13:05	
11:30		12:18		13:06	
11:31		12:19		13:07	
11:32		12:20		13:08	
11:33		12:21		13:09	
11:34		12:22		13:10	
11:35		12:23		13:11	
11:36		12:24		13:12	
11:37		12:25		13:13	
11:38		12:26		13:14	
11:39		12:27		13:15	
11:40		12:28		13:16	
11:41		12:29		13:17	
11:42		12:30		13:18	
11:43		12:31		13:19	
11:44		12:32		13:20	
11:45		12:33		13:21	
11:46		12:34		13:22	
11:47		12:35		13:23	
11:48		12:36		13:24	
11:49		12:37		13:25	
11:50		12:38		13:26	
11:51		12:39		13:27	
11:52		12:40		13:28	
11:53		12:41		13:29	
11:54		12:42		13:30	
11:55		12:43		13:31	
11:56		12:44		13:32	
11:57		12:45		13:33	
11:58		12:46		13:34	

ESP 20 Airgun Shots

13:35		14:23		15:11	
13:36		14:24		15:12	
13:37		14:25		15:13	
13:38		14:26		15:14	
13:39		14:27		15:15	
13:40		14:28		15:16	
13:41		14:29		15:17	
13:42		14:30		15:18	
13:43		14:31		15:19	
13:44		14:32		15:20	
13:45		14:33		15:21	
13:46		14:34		15:22	
13:47		14:35		15:23	
13:48		14:36		15:24	
13:49		14:37		15:25	
13:50		14:38		15:26	
13:51		14:39		15:27	
13:52		14:40		15:28	
13:53		14:41		15:29	
13:54		14:42		15:30	
13:55		14:43		15:31	
13:56		14:44		15:32	
13:57		14:45		15:33	
13:58		14:46		15:34	
13:59		14:47		15:35	
14:00		14:48		15:36	
14:01		14:49		15:37	
14:02		14:50		15:38	
14:03		14:51		15:39	
14:04		14:52		15:40	
14:05		14:53		15:41	
14:06		14:54		15:42	
14:07		14:55		15:43	
14:08		14:56		15:44	
14:09		14:57		15:45	
14:10		14:58		15:46	
14:11		14:59		15:47	
14:12		15:00		15:48	
14:13		15:01		15:49	
14:14		15:02		15:50	
14:15		15:03		15:51	
14:16		15:04		15:52	
14:17		15:05		15:53	
14:18		15:06		15:54	
14:19		15:07			
14:20		15:08			
14:21		15:09			
14:22		15:10			

ESP 21 Airgun Shots

22:58		23:46		0:34	
22:59		23:47		0:35	
23:00		23:48		0:36	
23:01		23:49		0:37	
23:02		23:50		0:38	
23:03		23:51		0:39	
23:04	Is late	23:52		0:40	
23:05		23:53		0:41	
23:06		23:54		0:42	
23:07		23:55		0:43	
23:08		23:56		0:44	
23:09		23:57		0:45	
23:10		23:58		0:46	
23:11		23:59		0:47	
23:12		0:00		0:48	
23:13		0:01		0:49	
23:14		0:02		0:50	
23:15		0:03		0:51	
23:16		0:04		0:52	
23:17		0:05		0:53	
23:18		0:06		0:54	
23:19		0:07		0:55	
23:20		0:08		0:56	
23:21		0:09		0:57	
23:22		0:10		0:58	
23:23		0:11		0:59	
23:24		0:12		1:00	
23:25		0:13		1:01	
23:26		0:14		1:02	
23:27		0:15		1:03	
23:28		0:16		1:04	
23:29		0:17		1:05	
23:30		0:18		1:06	
23:31		0:19		1:07	
23:32		0:20		1:08	
23:33		0:21		1:09	
23:34		0:22		1:10	
23:35		0:23		1:11	
23:36	?	0:24		1:12	
23:37	?	0:25		1:13	
23:38		0:26		1:14	
23:39		0:27		1:15	
23:40		0:28		1:16	
23:41		0:29		1:17	
23:42		0:30		1:18	
23:43		0:31		1:19	
23:44		0:32		1:20	
23:45		0:33		1:21	

ESP 21 Airgun Shots

1:22		2:10		2:58	
1:23		2:11		2:59	
1:24		2:12		3:00	
1:25		2:13		3:01	
1:26		2:14		3:02	
1:27		2:15		3:03	
1:28		2:16		3:04	
1:29		2:17		3:05	
1:30		2:18		3:06	
1:31		2:19		3:07	
1:32		2:20		3:08	
1:33		2:21		3:09	
1:34		2:22		3:10	
1:35		2:23		3:11	
1:36		2:24		3:12	
1:37		2:25		3:13	
1:38		2:26		3:14	
1:39		2:27		3:15	
1:40		2:28		3:16	
1:41		2:29		3:17	
1:42		2:30		3:18	
1:43		2:31		3:19	
1:44		2:32		3:20	
1:45		2:33		3:21	
1:46		2:34		3:22	
1:47		2:35		3:23	
1:48		2:36		3:24	
1:49		2:37		3:25	
1:50		2:38		3:26	
1:51		2:39		3:27	
1:52		2:40		3:28	
1:53		2:41		3:29	
1:54		2:42		3:30	
1:55		2:43		3:31	
1:56		2:44		3:32	
1:57		2:45		3:33	
1:58		2:46		3:34	
1:59		2:47		3:35	
2:00		2:48		3:36	
2:01		2:49		3:37	
2:02		2:50		3:38	
2:03		2:51		3:39	
2:04		2:52		3:40	
2:05		2:53		3:41	
2:06		2:54		3:42	
2:07		2:55		3:43	
2:08		2:56		3:44	
2:09		2:57		3:45	

ESP 21 Airgun Shots

3:46		4:34	
3:47		4:35	
3:48		4:36	
3:49		4:37	
3:50		4:38	
3:51		4:39	
3:52		4:40	
3:53		4:41	
3:54		4:42	
3:55			
3:56			
3:57			
3:58			
3:59			
4:00			
4:01			
4:02			
4:03			
4:04			
4:05			
4:06			
4:07			
4:08			
4:09			
4:10			
4:11			
4:12			
4:13			
4:14			
4:15			
4:16			
4:17			
4:18			
4:19			
4:20			
4:21			
4:22			
4:23			
4:24			
4:25			
4:26			
4:27			
4:28			
4:29			
4:30			
4:31			
4:32			
4:33			

ESP 22 Airgun Shots

6:05	7ms late	6:53	7:41
39094-5 6:06	7ms late	6:54	7:42
6:07		6:55	7:43
6:08		6:56	7:44
6:09		6:57	7:45
6:10		6:58	7:46
6:11		6:59	7:47
6:12		7:00	7:48
6:13		7:01	7:49
6:14		7:02	7:50
6:15		7:03	7:51
6:16		7:04	7:52
6:17		7:05	7:53
6:18		7:06	7:54
6:19		7:07	7:55
6:20		7:08	7:56
6:21		7:09	7:57
6:22		7:10	7:58
6:23		7:11	7:59
6:24		7:12	8:00
6:25		7:13	8:01
6:26		7:14	8:02
6:27		7:15	8:03
6:28		7:16	8:04
6:29		7:17	8:05
6:30		7:18	8:06
6:31		7:19	8:07
6:32		7:20	8:08
6:33		7:21	8:09
6:34		7:22	8:10
6:35		7:23	8:11
6:36		7:24	8:12
6:37		7:25	8:13
6:38		7:26	8:14
6:39		7:27	8:15
6:40		7:28	8:16
6:41		7:29	8:17
6:42		7:30	8:18
6:43		7:31	8:19
6:44		7:32	8:20
6:45		7:33	8:21
6:46		7:34	8:22
6:47		7:35	8:23
6:48		7:36	8:24
6:49		7:37	8:25
6:50		7:38	8:26
6:51		7:39	8:27
6:52		7:40	8:28

ESP 22 Airgun Shots

8:29		9:17		10:05	
8:30		9:18		10:06	
8:31		9:19		10:07	
8:32		9:20			
8:33		9:21			
8:34		9:22			
8:35		9:23			
8:36		9:24			
8:37		9:25			
8:38		9:26			
8:39		9:27			
8:40		9:28			
8:41		9:29			
8:42		9:30			
8:43		9:31			
8:44		9:32			
8:45		9:33			
8:46		9:34			
8:47		9:35			
8:48		9:36	Xtra @ 36:52		
8:49		9:37	?		
8:50		9:38			
8:51		9:39			
8:52		9:40			
8:53		9:41			
8:54		9:42			
8:55		9:43			
8:56		9:44			
8:57		9:45			
8:58		9:46			
8:59		9:47			
9:00		9:48			
9:01		9:49			
9:02		9:50			
9:03		9:51			
9:04		9:52			
9:05		9:53			
9:06		9:54			
9:07		9:55			
9:08		9:56			
9:09		9:57			
9:10		9:58			
9:11		9:59			
9:12		10:00			
9:13		10:01			
9:14		10:02			
9:15		10:03			
9:16		10:04			

Common Offset Airgun Shots

44382	6:13:40	11ms late	6:45:40		7:17:40	
44384	6:14:20	11ms late	6:46:20		7:18:20	
44386	6:15:00	11ms late	6:47:00		7:19:00	
	6:15:40		6:47:40		7:19:40	
	6:16:20		6:48:20		7:20:20	
	6:17:00		6:49:00		7:21:00	
	6:17:40		6:49:40		7:21:40	
	6:18:20		6:50:20		7:22:20	
	6:19:00		6:51:00		7:23:00	
	6:19:40		6:51:40		7:23:40	
	6:20:20		6:52:20		7:24:20	
	6:21:00		6:53:00		7:25:00	
	6:21:40		6:53:40		7:25:40	
	6:22:20		6:54:20		7:26:20	
	6:23:00		6:55:00		7:27:00	
	6:23:40		6:55:40		7:27:40	
	6:24:20		6:56:20		7:28:20	
	6:25:00		6:57:00		7:29:00	
	6:25:40		6:57:40		7:29:40	
	6:26:20		6:58:20		7:30:20	
	6:27:00		6:59:00		7:31:00	
	6:27:40		6:59:40		7:31:40	
	6:28:20		7:00:20		7:32:20	
	6:29:00		7:01:00		7:33:00	
	6:29:40		7:01:40		7:33:40	
	6:30:20		7:02:20		7:34:20	
	6:31:00		7:03:00		7:35:00	
	6:31:40		7:03:40		7:35:40	
	6:32:20		7:04:20		7:36:20	
	6:33:00		7:05:00		7:37:00	
	6:33:40		7:05:40		7:37:40	
	6:34:20		7:06:20		7:38:20	
	6:35:00		7:07:00		7:39:00	
	6:35:40		7:07:40		7:39:40	
	6:36:20		7:08:20		7:40:20	
	6:37:00		7:09:00		7:41:00	
	6:37:40		7:09:40		7:41:40	
	6:38:20		7:10:20		7:42:20	
	6:39:00		7:11:00		7:43:00	
	6:39:40		7:11:40		7:43:40	
	6:40:20		7:12:20		7:44:20	
	6:41:00		7:13:00		7:45:00	
	6:41:40		7:13:40		7:45:40	
	6:42:20		7:14:20		7:46:20	
	6:43:00		7:15:00		7:47:00	
	6:43:40		7:15:40		7:47:40	
	6:44:20		7:16:20		7:48:20	
	6:45:00		7:17:00		7:49:00	

Common Offset Airgun Shots

7:49:40		8:21:40		8:53:40	
7:50:20		8:22:20		8:54:20	
7:51:00		8:23:00		8:55:00	
7:51:40		8:23:40		8:55:40	
7:52:20		8:24:20		8:56:20	
7:53:00		8:25:00		8:57:00	
7:53:40		8:25:40		8:57:40	
7:54:20		8:26:20		8:58:20	
7:55:00		8:27:00		8:59:00	
7:55:40		8:27:40		8:59:40	
7:56:20		8:28:20		9:00:20	
7:57:00		8:29:00		9:01:00	
7:57:40		8:29:40		9:01:40	
7:58:20		8:30:20		9:02:20	
7:59:00		8:31:00		9:03:00	
7:59:40		8:31:40		9:03:40	
8:00:20		8:32:20		9:04:20	
8:01:00		8:33:00		9:05:00	
8:01:40		8:33:40		9:05:40	
8:02:20		8:34:20		9:06:20	
8:03:00		8:35:00		9:07:00	
8:03:40		8:35:40		9:07:40	
8:04:20		8:36:20		9:08:20	
8:05:00		8:37:00		9:09:00	
8:05:40		8:37:40		9:09:40	
8:06:20		8:38:20		9:10:20	
8:07:00		8:39:00		9:11:00	
8:07:40		8:39:40		9:11:40	
8:08:20		8:40:20		9:12:20	
8:09:00		8:41:00		9:13:00	
8:09:40		8:41:40		9:13:40	
8:10:20		8:42:20		9:14:20	
8:11:00		8:43:00		9:15:00	
8:11:40		8:43:40		9:15:40	
8:12:20		8:44:20		9:16:20	
8:13:00		8:45:00		9:17:00	
8:13:40		8:45:40		9:17:40	
8:14:20		8:46:20		9:18:20	
8:15:00		8:47:00		9:19:00	
8:15:40		8:47:40		9:19:40	
8:16:20		8:48:20		9:20:20	
8:17:00		8:49:00		9:21:00	
8:17:40		8:49:40		9:21:40	
8:18:20		8:50:20		9:22:20	
8:19:00		8:51:00		9:23:00	
8:19:40		8:51:40		9:23:40	
8:20:20		8:52:20		9:24:20	
8:21:00		8:53:00		9:25:00	

Common Offset Airgun Shots

9:25:40		9:57:40		10:29:40	
9:26:20		9:58:20		10:30:20	
9:27:00		9:59:00		10:31:00	
9:27:40		9:59:40		10:31:40	
9:28:20		10:00:20		10:32:20	
9:29:00		10:01:00		10:33:00	
9:29:40		10:01:40		10:33:40	
9:30:20		10:02:20		10:34:20	
9:31:00		10:03:00		10:35:00	
9:31:40		10:03:40		10:35:40	
9:32:20		10:04:20		10:36:20	
9:33:00		10:05:00		10:37:00	
9:33:40		10:05:40		10:37:40	
9:34:20		10:06:20		10:38:20	
9:35:00		10:07:00		10:39:00	
9:35:40		10:07:40		10:39:40	
9:36:20		10:08:20		10:40:20	
9:37:00		10:09:00		10:41:00	
9:37:40		10:09:40		10:41:40	
9:38:20		10:10:20		10:42:20	
9:39:00		10:11:00		10:43:00	
9:39:40		10:11:40		10:43:40	
9:40:20		10:12:20		10:44:20	
9:41:00		10:13:00		10:45:00	
9:41:40		10:13:40		10:45:40	
9:42:20		10:14:20		10:46:20	
9:43:00		10:15:00		10:47:00	
9:43:40		10:15:40		10:47:40	
9:44:20		10:16:20		10:48:20	
9:45:00		10:17:00		10:49:00	
9:45:40		10:17:40		10:49:40	
9:46:20		10:18:20		10:50:20	
9:47:00		10:19:00		10:51:00	
9:47:40		10:19:40		10:51:40	
9:48:20		10:20:20		10:52:20	
9:49:00		10:21:00		10:53:00	
9:49:40		10:21:40		10:53:40	
9:50:20		10:22:20		10:54:20	
9:51:00		10:23:00		10:55:00	
9:51:40		10:23:40		10:55:40	
9:52:20		10:24:20		10:56:20	
9:53:00		10:25:00		10:57:00	
9:53:40		10:25:40		10:57:40	
9:54:20		10:26:20		10:58:20	
9:55:00		10:27:00		10:59:00	
9:55:40		10:27:40		10:59:40	
9:56:20		10:28:20		11:00:20	
9:57:00		10:29:00		11:01:00	

Common Offset Airgun Shots

11:01:40		11:33:40		12:05:40	
11:02:20		11:34:20		12:06:20	
11:03:00		11:35:00		12:07:00	
11:03:40		11:35:40		12:07:40	
11:04:20		11:36:20		12:08:20	
11:05:00		11:37:00		12:09:00	
11:05:40		11:37:40		12:09:40	
11:06:20		11:38:20		12:10:20	
11:07:00		11:39:00		12:11:00	
11:07:40		11:39:40		12:11:40	
11:08:20		11:40:20		12:12:20	
11:09:00		11:41:00		12:13:00	
11:09:40		11:41:40		12:13:40	
11:10:20		11:42:20		12:14:20	
11:11:00		11:43:00		12:15:00	
11:11:40		11:43:40		12:15:40	
11:12:20		11:44:20		12:16:20	
11:13:00		11:45:00		12:17:00	
11:13:40		11:45:40		12:17:40	
11:14:20		11:46:20		12:18:20	
11:15:00		11:47:00		12:19:00	
11:15:40		11:47:40		12:19:40	
11:16:20		11:48:20		12:20:20	
11:17:00		11:49:00		12:21:00	
11:17:40		11:49:40		12:21:40	
11:18:20		11:50:20		12:22:20	
11:19:00		11:51:00		12:23:00	
11:19:40		11:51:40		12:23:40	
11:20:20		11:52:20		12:24:20	
11:21:00		11:53:00		12:25:00	
11:21:40		11:53:40		12:25:40	
11:22:20		11:54:20		12:26:20	
11:23:00		11:55:00		12:27:00	
11:23:40		11:55:40		12:27:40	
11:24:20		11:56:20		12:28:20	
11:25:00		11:57:00		12:29:00	
11:25:40		11:57:40		12:29:40	
11:26:20		11:58:20		12:30:20	
11:27:00		11:59:00		12:31:00	
11:27:40		11:59:40		12:31:40	
11:28:20		12:00:20		12:32:20	
11:29:00		12:01:00		12:33:00	
11:29:40		12:01:40		12:33:40	
11:30:20		12:02:20		12:34:20	
11:31:00		12:03:00		12:35:00	
11:31:40		12:03:40		12:35:40	
11:32:20		12:04:20		12:36:20	
11:33:00		12:05:00		12:37:00	

Common Offset Airgun Shots

12:37:40		13:09:40		13:41:40	
12:38:20		13:10:20		13:42:20	
12:39:00		13:11:00		13:43:00	
12:39:40		13:11:40		13:43:40	
12:40:20		13:12:20		13:44:20	
12:41:00		13:13:00		13:45:00	
12:41:40		13:13:40		13:45:40	
12:42:20		13:14:20		13:46:20	
12:43:00		13:15:00		13:47:00	
12:43:40		13:15:40		13:47:40	
12:44:20		13:16:20		13:48:20	
12:45:00		13:17:00		13:49:00	
12:45:40		13:17:40		13:49:40	
12:46:20		13:18:20		13:50:20	
12:47:00		13:19:00		13:51:00	
12:47:40		13:19:40		13:51:40	
12:48:20		13:20:20		13:52:20	
12:49:00		13:21:00		13:53:00	
12:49:40		13:21:40		13:53:40	
12:50:20		13:22:20		13:54:20	
12:51:00		13:23:00		13:55:00	
12:51:40		13:23:40		13:55:40	
12:52:20		13:24:20		13:56:20	
12:53:00		13:25:00		13:57:00	
12:53:40		13:25:40		13:57:40	
12:54:20		13:26:20		13:58:20	
12:55:00		13:27:00		13:59:00	
12:55:40		13:27:40		13:59:40	
12:56:20		13:28:20		14:00:20	
12:57:00		13:29:00		14:01:00	
12:57:40		13:29:40		14:01:40	
12:58:20		13:30:20		14:02:20	
12:59:00		13:31:00		14:03:00	
12:59:40		13:31:40		14:03:40	
13:00:20		13:32:20		14:04:20	
13:01:00		13:33:00		14:05:00	
13:01:40		13:33:40		14:05:40	
13:02:20		13:34:20		14:06:20	
13:03:00		13:35:00		14:07:00	
13:03:40		13:35:40		14:07:40	
13:04:20		13:36:20		14:08:20	
13:05:00		13:37:00		14:09:00	
13:05:40		13:37:40		14:09:40	
13:06:20		13:38:20		14:10:20	
13:07:00		13:39:00		14:11:00	
13:07:40		13:39:40		14:11:40	
13:08:20		13:40:20		14:12:20	
13:09:00		13:41:00		14:13:00	

Common Offset Airgun Shots

14:13:40		14:45:40		15:17:40	
14:14:20		14:46:20		15:18:20	
14:15:00		14:47:00		15:19:00	
14:15:40		14:47:40		15:19:40	
14:16:20		14:48:20		15:20:20	
14:17:00		14:49:00		15:21:00	
14:17:40		14:49:40		15:21:40	
14:18:20		14:50:20		15:22:20	
14:19:00		14:51:00		15:23:00	
14:19:40		14:51:40		15:23:40	
14:20:20		14:52:20		15:24:20	
14:21:00		14:53:00		15:25:00	
14:21:40		14:53:40		15:25:40	
14:22:20		14:54:20		15:26:20	
14:23:00		14:55:00		15:27:00	
14:23:40		14:55:40		15:27:40	
14:24:20		14:56:20		15:28:20	
14:25:00		14:57:00		15:29:00	
14:25:40		14:57:40		15:29:40	
14:26:20		14:58:20		15:30:20	
14:27:00		14:59:00		15:31:00	
14:27:40		14:59:40		15:31:40	
14:28:20		15:00:20		15:32:20	
14:29:00		15:01:00		15:33:00	
14:29:40		15:01:40		15:33:40	
14:30:20		15:02:20		15:34:20	
14:31:00		15:03:00		15:35:00	
14:31:40		15:03:40		15:35:40	
14:32:20		15:04:20		15:36:20	
14:33:00		15:05:00		15:37:00	
14:33:40		15:05:40		15:37:40	
14:34:20		15:06:20		15:38:20	
14:35:00		15:07:00		15:39:00	
14:35:40		15:07:40		15:39:40	
14:36:20		15:08:20		15:40:20	
14:37:00		15:09:00		15:41:00	
14:37:40		15:09:40		15:41:40	
14:38:20		15:10:20		15:42:20	
14:39:00		15:11:00		15:43:00	
14:39:40		15:11:40		15:43:40	
14:40:20		15:12:20		15:44:20	
14:41:00		15:13:00		15:45:00	
14:41:40		15:13:40		15:45:40	
14:42:20		15:14:20		15:46:20	
14:43:00		15:15:00		15:47:00	
14:43:40		15:15:40		15:47:40	
14:44:20		15:16:20		15:48:20	
14:45:00		15:17:00		15:49:00	

Common Offset Airgun Shots

15:49:40		16:21:40		16:53:40	
15:50:20		16:22:20		16:54:20	
15:51:00		16:23:00		16:55:00	
15:51:40		16:23:40		16:55:40	
15:52:20		16:24:20		16:56:20	
15:53:00		16:25:00		16:57:00	
15:53:40		16:25:40		16:57:40	
15:54:20		16:26:20		16:58:20	
15:55:00		16:27:00		16:59:00	
15:55:40		16:27:40		16:59:40	
15:56:20		16:28:20		17:00:20	
15:57:00		16:29:00		17:01:00	
15:57:40		16:29:40		17:01:40	
15:58:20		16:30:20		17:02:20	
15:59:00		16:31:00		17:03:00	
15:59:40		16:31:40		17:03:40	
16:00:20		16:32:20		17:04:20	
16:01:00		16:33:00		17:05:00	
16:01:40		16:33:40		17:05:40	
16:02:20		16:34:20		17:06:20	
16:03:00		16:35:00		17:07:00	
16:03:40		16:35:40		17:07:40	
16:04:20		16:36:20		17:08:20	
16:05:00		16:37:00		17:09:00	
16:05:40		16:37:40		17:09:40	
16:06:20		16:38:20		17:10:20	
16:07:00		16:39:00		17:11:00	
16:07:40		16:39:40		17:11:40	
16:08:20		16:40:20		17:12:20	
16:09:00		16:41:00		17:13:00	
16:09:40		16:41:40		17:13:40	
16:10:20		16:42:20		17:14:20	
16:11:00		16:43:00		17:15:00	
16:11:40		16:43:40		17:15:40	
16:12:20		16:44:20		17:16:20	
16:13:00		16:45:00		17:17:00	
16:13:40		16:45:40		17:17:40	
16:14:20		16:46:20		17:18:20	
16:15:00		16:47:00		17:19:00	
16:15:40		16:47:40		17:19:40	
16:16:20		16:48:20		17:20:20	
16:17:00		16:49:00		17:21:00	
16:17:40		16:49:40		17:21:40	
16:18:20		16:50:20		17:22:20	
16:19:00		16:51:00		17:23:00	
16:19:40		16:51:40		17:23:40	
16:20:20		16:52:20		17:24:20	
16:21:00		16:53:00		17:25:00	

Common Offset Airgun Shots

17:25:40	
17:26:20	
17:27:00	
17:27:40	
17:28:20	
17:29:00	

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FAX:

To: Peter Buhl
Lamont-Doherty Geological Observatory
fax: 914-365-3181
Number of pages: 2

From: Alistair Harding
Scripps Institution of Oceanography
Tel: (619)-534-4301
Fax: (619)-534-5332

Dear Peter

I am sending you a layout of the airguns and GPS receiver on the Washington during the southern EPR experiment.

The navigation data for the Washington is on our system in a directory //mona/mcsdata/nav/twash. Each file is named esp01 .. esp23, and wapl. The data has been decimated to 20 sec data and includes the satellite information. The data can be accessed using ftp through bull.ucsd.edu (132.239.13.10). Dave Caress should be able to show you how to log onto the apollo system. If not let me know and I will arrange a temporary account for you.

yours Alistair

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Airgun Layout on R/V Washington during TERA

