UNIVERSITY COLLEGE CHICHESTER

an accredited college of the UNIVERSITY OF SOUTHAMPTON

School of Sport, Exercise and Health Sciences

The Physiological Demands of Elite Single-Handed Dinghy Sailing

by

Peter Cunningham

Volume 2 of 2

Thesis for the degree of Doctor of Philosophy

June 2004

TEXT BOUND CLOSE TO THE SPINE IN THE ORIGINAL THESIS

CONTENTS.

APPENDIX A

(relevant to chapters 3, 4, 5, 6 and 7)

Health questionnaire and consent forms.

University College Chichester

Bishop Otter Campus
College Lane, Chichester
West Sussex. PO19 6PE

Fax: (01243) 816080

Tel: (01243) 816000

www.ucc.ac.uk

Before we can carry out any physiological tests on you, we have to check that you are in a reasonably heathly condition to undergo strenuous exercise.
PLEASE complete the following questionnaire about yourself.

ALL information will be treated as **strictly confidential.**

NAME : **DATE OF BIRTH :**
Specialist Sport : **SEX {M/F}** ☐ **AGE:** ☐

1 How best would you describe your present level of ' activity ' in both your work and recreation ?

Sedentary ☐ Moderate Activity ☐ Active ☐ Highly Active ☐

2 In terms of ' fitness ' how would you best describe your present level ?

Very Unfit ☐ Medium Fitness ☐ Trained ☐ Highly Trained ☐

3 How do you view your ' current bodyweight ' ? Are you ?

Under Weight ☐ Ideal Weight ☐ Slightly Overweight ☐ Very Overweight ☐

4 Are you , or , have you ever been a ' smoker ' ?

YES : ☐ NO : ☐

If YES, how many did you smoke ? ☐ Still do smoke ? ☐

5 Do you drink ' alcohol ' ?

YES : ☐ NO : ☐

If YES, do you consider yourself to be a – ?
Very Light Drinker ☐ Light Drinker ☐ Moderate Drinker ☐ Heavy Drinker ☐

6 Have you had to consult a doctor within the last 6 months ? If so, say briefly why ?

7 Have you suffered from a bacterial / viral infection, in the last 2 weeks ?

YES : ☐ NO : ☐

If so, say briefly why ?

8 Are you taking any form of medication ? YES : ☐ NO : ☐
If YES, give details :

5

Strongly Committed to Equal Opportunities

9 **Are you a ' Diabetic ' ?** YES : ☐ NO: ☐
If YES, give details :

10 **Are you a current or past ' Asthmatic ' ?** YES : ☐ NO : ☐
If YES, give details :

11 **Have you ever suffered from ' Bronchitis ' ?** YES : ☐ NO : ☐
If YES, give details :

12 **Do you suffer from any form of ' Heart Disease '?**
YES : ☐ NO : ☐
If YES, give details :

13 **Is there any ' history ' of Heart Disease in your family ?**
YES : ☐ NO : ☐
If YES, give details :

14 **Do you currently have any Muscular or Joint Injury ?**
YES : ☐ NO : ☐
If YES, give details :

15 **Have you ever suffered from ' Hepatitis ' ?** YES : ☐ NO : ☐
If YES, give details :

16 **Have you ever had a ' Blood Transfusion ' ?** YES : ☐ NO : ☐
IF YES, give details :

17 **Are you / or have you ever been considered as, at ' risk ' from AIDS - [Acquired Immune Deficiency Syndrome] ?**
YES : ☐ NO : ☐

18 **Have you had to suspend your ' normal ' training routine, for any reason in the last 2 weeks ?**
YES : ☐ NO: ☐
If YES, give details :

19 **LASTLY, is there anything to your knowledge, that could prevent you from completing the ' tests' that have been outlined to you ?**
YES : ☐ NO : ☐
If YES, give details :

SIGN : **DATE :**

University College Chichester™

Bishop Otter Campus
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West Sussex. PO19 6PE

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INFORMED CONSENT FOR PHYSIOLOGICAL TESTING PROCEDURES

I, (PRINT NAME & DATE) ______________________________

hereby give my consent to participate in the exercise test(s) explained to me. I am satisfied that I understand the procedures involved & accept the possible health risks due to the strenuous nature of exercise testing.

In particular, I am aware of the possible dangers of certain blood borne diseases (HIV, Hepatitis B, etc) associated with blood sampling. Also, I recognize that I am at liberty to withdraw my involvement at any stage, during the exercise.

Subject's full signature ______________________

Experimenter's signature ______________________

Supervisor's signature ______________________

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APPENDIX B

(relevant to chapters 3 and 7)

Chapter 3 and 7: Anthropometric and physiological profiles of dinghy sailors.

Anthropometric data for British Olympic sailing squads reported in chapter 3.

FEMALE

Name	Age	Mass	HT	BMI	skinfold sum	%B/FAT	
470 crew	24	71.8	1.763	23.1	54.7	28.1	
470 crew	23	67.3	1.75	22.0	59.8	29.4	
470 crew	21	65.1	1.766	20.9	34.0	21.4	N=3
MEAN	**22.67**	**68.07**	**1.76**	**22.0**	**49.5**	**26.31**	
S.D.	**1.53**	**3.42**	**0.01**	**1.1**	**13.7**	**4.31**	
470 helm	21	60.9	1.71	20.8	52.5	27.5	
470 helm	27	50.2	1.577	20.2	23.0	16	
470 helm	24	51.9	1.59	20.5	37.1	22.6	
470 helm	23	53.9	1.61	20.8	55.5	28.3	
470 helm	23	54.5	1.64	20.3	59.1	29.2	N=5
MEAN	**23.60**	**54.28**	**1.63**	**20.5**	**45.4**	**24.74**	
S.D.	**2.19**	**4.07**	**0.05**	**0.3**	**15.1**	**5.53**	
Board	20	58.9	1.66	21.4	32.6	20.8	
Board	27	66.6	1.73	22.3	41.5	24.2	
Board	18	69.6	1.797	21.6	59.5	29.3	
Board	28	57.7	1.612	22.2	32.0	20.5	N=4
MEAN	**23.25**	**63.20**	**1.70**	**21.8**	**41.4**	**23.72**	
S.D.	**4.99**	**5.81**	**0.08**	**0.4**	**12.8**	**4.1**	
Europe	21	61.9	1.628	23.4	59.0	29.2	
Europe	22.3	66.8	1.738	22.1	56.1	28.5	
Europe	22.9	62.4	1.638	23.3	65.5	30.7	
Europe	24.9	69	1.709	23.6	59.3	29.3	
Europe	24.6	65.6	1.64	24.4	46.7	25.9	
Europe	23	65.8	1.77	21.0	40.7	23.9	
Europe	19.8	67.3	1.691	23.5	61.3	29.8	
Europe	23	63.5	1.67	22.8	48.1	26.3	
Europe	32	67.6	1.68	24.0	46.4	25.8	
Europe	27	74.9	1.69	26.2	62.8	30.1	N=10
MEAN	**24.05**	**66.48**	**1.69**	**23.4**	**54.6**	**28.0**	
S.D.	3.45	3.76	**0.05**	1.4	**8.4**	**2.3**	

Yingling bow	22	75.3	1.76	24.3	69.2	31.5	
Yngling bow	28	59.1	1.63	22.2	42.2	24.4	
Yngling bow	22	63.5	1.663	23.0	48.2	26.3	N=3
MEAN	**24.00**	**65.97**	**1.68**	**23.2**	**53.2**	**27.43**	
S.D.	**3.46**	**8.38**	**0.07**	**1.0**	**14.2**	**3.68**	
Yngling helm	47	65.4	1.602	25.5	77.7	33.2	
Yngling helm	23	58.4	1.64	21.7	52.4	27.5	
Yngling helm	24	60.7	1.68	21.5	60.7	29.6	
Yngling helm	33	64.4	1.678	22.9	46.4	25.8	N=4
MEAN	**31.75**	**62.23**	**1.65**	**22.9**	**59.3**	**29.04**	
S.D.	**11.12**	**3.25**	**0.04**	**1.8**	**13.6**	**3.21**	
Yngling middle	22	76.4	1.777	24.2	57.9	28.9	
Yngling middle	25	79.8	1.8	24.6	77.4	33.2	
Yngling middle	27	74.9	1.75	24.5	62.9	30.1	N=3
MEAN	**24.67**	**77.03**	**1.78**	**24.4**	**66.1**	**30.76**	
S.D.	**2.52**	**2.51**	**0.03**	**0.2**	**10.1**	**2.18**	

Overall Female Values

	Age	Mass	HT	BMI	skinfold sum	%B/FAT	N=32
Mean	24.6	64.8	1.69	22.7	52.4	27.1	
SD	5.3	7.2	0.06	1.6	12.9	3.9	

MALE

Name	Age	Mass	HT	BMI	skinfold sum	%B/FAT	
470 crew	20	66	1.78	20.8	23.0	9.6	
470 crew	25	70	1.848	20.5	28.8	12.2	
470 crew	20	69.5	1.751	22.7	20.9	8.5	
470 crew	24	70	1.81	21.4	23.9	10	
470 crew	18	66.1	1.77	21.1	23.2	9.7	
470 crew	21	71	1.83	21.2	30.4	12.9	N=6
MEAN	**21.3**	**68.8**	**1.80**	**21.3**	**25.0**	**10.49**	
S.D.	**2.7**	**2.2**	**0.04**	**0.7**	**3.7**	**1.7**	
470 helm	23	65.5	1.738	21.7	19.8	7.8	
470 helm	20	63.6	1.743	20.9	32.4	13.6	
470 helm	23	61.25	1.746	20.1	29.9	12.7	
470 helm	26	59.9	1.73	20.0	27.7	11.8	N=4
MEAN	**23.0**	**62.6**	**1.74**	**20.7**	**27.5**	**11.49**	
S.D.	**2.4**	**2.5**	**0.01**	**0.8**	**5.4**	**2.55**	
49er crew	18	72.1	1.827	21.6	35.0	14.6	
49er crew	24	72.8	1.84	21.5	21.7	8.9	
49er crew	22	71.9	1.824	21.6	27.2	11.6	
49er crew	26	79.4	1.85	23.2	44.4	17.4	
49er crew	18	78.9	1.905	21.7	41.9	16.7	
49er crew	23	77.6	1.882	21.9	25.2	10.7	
49er crew	25	77.2	1.83	23.1	30.8	13	
49er crew	30	80.4	1.833	23.9	21.3	8.7	N=8
MEAN	**23.3**	**76.3**	**1.85**	**22.3**	**30.9**	**12.7**	
S.D.	**4.0**	**3.5**	**0.03**	**0.9**	**8.8**	**3.34**	
49er helm	35	81.4	1.73	27.2	38.6	15.7	
49er helm	24	74.6	1.8	23.0	39.0	15.9	
49er helm	20	74.8	1.874	21.3	33.2	13.9	
49er helm	24	69.9	1.734	23.2	32.7	13.8	
49er helm	19	66.1	1.791	20.6	28.1	12	
49er helm	36	70	1.71	23.9	48.1	18.4	
49er helm	24	75.5	1.777	23.9	59.0	20.9	N=7

MEAN	**26.0**	**73.2**	**1.77**	**23.3**	**39.8**	**15.79**	
S.D.	**6.8**	**5.0**	**0.06**	**2.1**	**10.6**	**3.03**	
Board	17	67.7	1.77	21.6	33.8	14.1	
Board	26	69.7	1.75	22.8	22.6	9.4	
Board	23	69.8	1.765	22.4	25.4	10.8	
Board	23	72.3	1.811	22.0	35.7	14.8	
Board	15	61.8	1.662	22.4	36.0	14.9	
Board	19	69.3	1.791	21.6	29.2	12.4	N=6
MEAN	**20.5**	**68.4**	**1.76**	**22.1**	**30.5**	**12.73**	
S.D.	**4.2**	**3.6**	**0.05**	**0.5**	**5.6**	**2.29**	
Finn	26.5	100.1	1.827	30.0	68.0	22.7	
Finn	26.2	94	1.834	27.9	38.5	15.7	
Finn	22	94	1.83	28.1	60.0	21.1	
Finn	21.1	102.8	1.954	26.9	33.4	14	
Finn	18.4	93.9	1.85	27.4	53.9	19.8	
Finn	24.4	98	2.009	24.3	39.6	16	
Finn	18.6	94.1	1.982	24.0	53.6	19.8	
Finn	23	90	1.84	26.6	52.6	19.5	N=8
MEAN	**22.5**	**95.9**	**1.89**	**26.9**	**50.0**	**18.6**	
S.D.	**3.1**	**4.1**	**0.08**	**2.0**	**11.8**	**3.0**	
Laser	27	83.8	1.87	24.0	27.1	11.5	
Laser	25	77.5	1.78	24.5	35.4	14.7	
Laser	16	71.8	1.89	20.1	21.8	9	
Laser	23	78.3	1.775	24.9	28.5	12.1	
Laser	21	81.2	1.825	24.4	32.0	13.5	
Laser	21	83.3	1.835	24.7	44.6	17.5	
Laser	21	79.2	1.84	23.4	31.3	13.2	
Laser	18.5	83.2	1.91	22.8	33.8	14.1	
Laser	30	78.1	1.835	23.2	20.5	8.2	
Laser	22	82.6	1.76	26.7	44.9	17.6	
Laser	22	73.9	1.785	23.2	42.0	16.8	
Laser	17.1	86	1.896	23.9	41.3	16.6	N=12
MEAN	**22.0**	**79.9**	**1.83**	**23.8**	**33.6**	**13.7**	
S.D.	**4.0**	**4.2**	**0.05**	**1.6**	**8.4**	**3.1**	

Star crew	22	113	2	28.3	78.8	24.5	
Star crew	31	107.4	1.76	34.7	64.4	22	
Star crew	33	128	2	32.0	70.0	23	
Star crew	32	98.7	1.955	25.8	48.3	18.5	N=4
MEAN	**29.5**	**111.8**	**1.93**	**30.2**	**65.4**	**21.98**	
S.D.	**5.1**	**12.3**	**0.11**	**3.9**	**12.8**	**2.57**	
Star helm	28	98	1.87	28.0	39.4	16	
Star helm	32	71	1.77	22.7	27.9	11.9	
Star helm	34	96.6	1.82	29.2	43.8	17.3	
Star helm	35	80.8	1.79	25.2	57.4	20.6	N=4
MEAN	**32.3**	**86.6**	**1.81**	**26.3**	**42.1**	**16.42**	
S.D.	**3.1**	**13.0**	**0.04**	**2.9**	**12.2**	**3.6**	
Tornado crew	26	67	1.8	20.7	30.3	12.8	
Tornado crew	24	85.4	1.9	23.7	35.3	14.7	
Tornado crew	24	73.2	1.745	24.0	28.7	12.2	N=3
MEAN	**24.7**	**75.2**	**1.82**	**22.8**	**31.4**	**13.24**	
S.D.	**1.2**	**9.4**	**0.08**	**1.8**	**3.4**	**1.28**	
Tornado helm	21	68.4	1.72	23.1	31.8	13.4	
Tornado helm	26	66.9	1.71	22.9	31.8	13.4	
Tornado helm	32	74.5	1.855	21.7	23.7	9.9	N=3
MEAN	**26.3**	**69.9**	**1.76**	**22.5**	**29.1**	**12.26**	
S.D.	**5.5**	**4.0**	**0.08**	**0.8**	**4.7**	**2.01**	

Overall male Values

	Age	Mass	HT	BMI	skinfold sum	%B/FAT	
Mean	**23.7**	**79.4**	**1.82**	**23.8**	**37.1**	**14.6**	**N=65**
SD	**4.8**	**13.8**	**0.07**	**3.1**	**14.4**	**4.2**	

Mean anthropometric values for females (N=32)

Name	Age	Mass	HT	BMI	skinfold sum	%B/FAT
Female	21	61.9	1.628	23.36	59	29.2
Female	22	76.4	1.777	24.19	57.9	28.9
Female	21	67.7	1.73	22.62	51.2	27.2
Female	20	58.9	1.66	21.37	32.6	20.8
Female	27	66.6	1.73	22.25	41.5	24.2
Female	18	69.6	1.797	21.55	59.5	29.3
Female	47	65.4	1.602	25.48	77.7	33.2
Female	21	60.9	1.71	20.83	52.5	27.5
Female	22	62.4	1.638	23.26	65.3	30.7
Female	27	50.2	1.577	20.19	23	16
Female	25	79.8	1.8	24.63	77.4	33.2
Female	28	59.1	1.63	22.24	42.2	24.4
Female	24	71.8	1.763	23.10	54.7	28.1
Female	22	75.3	1.76	24.31	69.2	31.5
Female	24	51.9	1.59	20.53	37.1	22.6
Female	23	63.5	1.67	22.8	48.1	26.3
Female	32	67.6	1.68	24.0	46.4	25.8
Female	27	74.9	1.69	26.2	62.8	30.1
Female	23	67.3	1.75	21.98	59.8	29.4
Female	24	69	1.709	23.62	59.5	29.3
Female	23	65.6	1.64	24.39	46.7	25.9
Female	23	53.9	1.61	20.79	55.5	28.3
Female	23	58.4	1.64	21.71	52.4	27.5
Female	23	65.8	1.765	21.12	40.6	23.9
Female	20	67.3	1.69	23.56	61.4	29.8
Female	28	57.7	1.612	22.20	32	20.5
Female	24	60.7	1.68	21.51	60.7	29.6
Female	23	54.5	1.64	20.26	59.1	29.2
Female	22	63.5	1.663	22.96	48.2	26.3
Female	27	74.9	1.75	24.46	62.9	30.1
Female	21	65.1	1.766	20.87	34	21.4
Female	33	64.4	1.678	22.87	46.4	25.8
Mean	**24.63**	**64.75**	**1.69**	**22.66**	**52.42**	**27.06**
s.d.	**5.26**	**7.21**	**0.06**	**1.56**	**12.85**	**3.85**

Females n=32

Mean anthropometric values for males (N=65)

Male	26	67	1.8	20.7	30.3	12.8
Male	35	81.4	1.73	27.2	38.6	15.7
Male	18	72.1	1.827	21.6	35	14.6
Male	24	72.8	1.84	21.5	21.7	8.9
Male	24	74.6	1.8	23.0	39	15.9
Male	26	100.1	1.827	30.0	68.5	22.7
Male	26	93	1.834	27.6	38.3	15.6
Male	20	74.8	1.874	21.3	33.2	13.9
Male	22	71.9	1.824	21.6	27.2	11.6
Male	25	70	1.848	20.5	28.8	12.2
Male	23	94	1.83	28.1	59.9	21.1
Male	22	105.4	1.954	27.6	36.4	15
Male	24	69.9	1.734	23.2	32.7	13.8
Male	23	78.3	1.82	23.6	28.4	12.1
Male	17	67.7	1.77	21.6	33.8	14.1
Male	26	108.4	1.85	31.7	77.7	24.3
Male	26	69.7	1.75	22.8	22.6	9.4
Male	20	93.3	2.009	23.1	54.1	19.8
Male	22	113	2	28.3	78.8	24.5
Male	23	83.8	1.87	24.0	27.1	11.5
Male	20	69.5	1.751	22.7	20.9	8.5
Male	15	71.8	1.896	20.0	22	9.1
Male	25	77.5	1.798	24.0	35.5	14.7
Male	23	65.5	1.738	21.7	19.8	7.8
Male	28	78.1	1.851	22.8	20.5	8.2
Male	28	98	1.87	28.0	39.4	16
Male	26	79.4	1.85	23.2	44.4	17.4
Male	32	71	1.77	22.7	27.9	11.9
Male	20	73.9	1.775	23.5	42.2	16.8
Male	34	96.6	1.82	29.2	43.8	17.3
Male	23	85	1.83	25.4	45.1	17.6
Male	31	107.4	1.76	34.7	64.4	22
Male	24	70	1.81	21.4	23.9	10
Male	18	78.9	1.905	21.7	41.9	16.7
Male	20	66	1.78	20.8	23	9.6
Male	20	63.6	1.743	20.9	32.4	13.6

Male	19	66.1	1.791	20.6	28.1	12
Male	21	68.4	1.72	23.1	31.8	13.4
Male	23	69.8	1.765	22.4	25.4	10.8
Male	18	94.1	1.982	24.0	32.9	13.8
Male	23	77.6	1.882	21.9	25.2	10.7
Male	24	85.4	1.9	23.7	35.3	14.7
Male	33	128	2	32.0	70	23
Male	21	84.5	1.834	25.1	49.3	18.7
Male	23	61.25	1.746	20.1	29.9	12.7
Male	21	79.2	1.841	23.4	31.2	13.2
Male	24	73.2	1.745	24.0	28.7	12.2
Male	22	94	1.84	27.8	64	21.9
Male	18	66.1	1.77	21.1	23.2	9.7
Male	23	72.3	1.811	22.0	35.7	14.8
Male	26	59.9	1.73	20.0	27.7	11.8
Male	17	83.2	1.92	22.6	33.8	14.1
Male	21	71	1.83	21.2	30.4	12.9
Male	36	70	1.71	23.9	48.1	18.4
Male	15	61.8	1.662	22.4	36	14.9
Male	25	77.2	1.83	23.1	30.8	13
Male	24	79.5	1.88	22.5	29.9	12.7
Male	26	66.9	1.71	22.9	31.8	13.4
Male	30	80.4	1.833	23.9	21.3	8.7
Male	32	74.5	1.855	21.7	23.7	9.9
Male	21	98.7	1.955	25.8	48.3	18.5
Male	24	75.5	1.777	23.9	59	20.9
Male	35	80.8	1.79	25.2	57.4	20.6
Male	20	78.3	1.85	22.9	35.7	14.8
Male	19	69.3	1.791	21.6	29.2	12.4
Mean	**23.74**	**79.39**	**1.82**	**23.79**	**37.12**	**14.54**
S.D.	**4.81**	**13.84**	**0.07**	**3.10**	**14.36**	**4.19**

Males
N=65

Mean values for male & females combined (N=97)

Name	Age	Mass	HT	BMI	skinfold sum	%B/FAT
Female	21	61.9	1.628	23.36	59	29.2
Female	22	76.4	1.777	24.19	57.9	28.9
Female	21	67.7	1.73	22.62	51.2	27.2
Female	20	58.9	1.66	21.37	32.6	20.8
Female	27	66.6	1.73	22.25	41.5	24.2
Female	18	69.6	1.797	21.55	59.5	29.3
Female	47	65.4	1.602	25.48	77.7	33.2
Female	21	60.9	1.71	20.83	52.5	27.5
Female	22	62.4	1.638	23.26	65.3	30.7
Female	27	50.2	1.577	20.19	23	16
Female	25	79.8	1.8	24.63	77.4	33.2
Female	28	59.1	1.63	22.24	42.2	24.4
Female	24	71.8	1.763	23.10	54.7	28.1
Female	22	75.3	1.76	24.31	69.2	31.5
Female	24	51.9	1.59	20.53	37.1	22.6
Female	23	63.5	1.67	22.8	48.1	26.3
Female	32	67.6	1.68	24.0	46.4	25.8
Female	27	74.9	1.69	26.2	62.8	30.1
Female	23	67.3	1.75	21.98	59.8	29.4
Female	24	69	1.709	23.62	59.5	29.3
Female	23	65.6	1.64	24.39	46.7	25.9
Female	23	53.9	1.61	20.79	55.5	28.3
Female	23	58.4	1.64	21.71	52.4	27.5
Female	23	65.8	1.765	21.12	40.6	23.9
Female	20	67.3	1.69	23.56	61.4	29.8
Female	28	57.7	1.612	22.20	32	20.5
Female	24	60.7	1.68	21.51	60.7	29.6
Female	23	54.5	1.64	20.26	59.1	29.2
Female	22	63.5	1.663	22.96	48.2	26.3
Female	27	74.9	1.75	24.46	62.9	30.1
Female	21	65.1	1.766	20.87	34	21.4
Female	33	64.4	1.678	22.87	46.4	25.8
Male	26	67	1.8	20.7	30.3	12.8
Male	35	81.4	1.73	27.2	38.6	15.7
Male	18	72.1	1.827	21.6	35	14.6

Females n=32

Male	24	72.8	1.84	21.5	21.7	8.9
Male	24	74.6	1.8	23.0	39	15.9
Male	26	100.1	1.827	30.0	68.5	22.7
Male	26	93	1.834	27.6	38.3	15.6
Male	20	74.8	1.874	21.3	33.2	13.9
Male	22	71.9	1.824	21.6	27.2	11.6
Male	25	70	1.848	20.5	28.8	12.2
Male	23	94	1.83	28.1	59.9	21.1
Male	22	105.4	1.954	27.6	36.4	15
Male	24	69.9	1.734	23.2	32.7	13.8
Male	23	78.3	1.82	23.6	28.4	12.1
Male	17	67.7	1.77	21.6	33.8	14.1
Male	26	108.4	1.85	31.7	77.7	24.3
Male	26	69.7	1.75	22.8	22.6	9.4
Male	20	93.3	2.009	23.1	54.1	19.8
Male	22	113	2	28.3	78.8	24.5
Male	23	83.8	1.87	24.0	27.1	11.5
Male	20	69.5	1.751	22.7	20.9	8.5
Male	15	71.8	1.896	20.0	22	9.1
Male	25	77.5	1.798	24.0	35.5	14.7
Male	23	65.5	1.738	21.7	19.8	7.8
Male	28	78.1	1.851	22.8	20.5	8.2
Male	28	98	1.87	28.0	39.4	16
Male	26	79.4	1.85	23.2	44.4	17.4
Male	32	71	1.77	22.7	27.9	11.9
Male	20	73.9	1.775	23.5	42.2	16.8
Male	34	96.6	1.82	29.2	43.8	17.3
Male	23	85	1.83	25.4	45.1	17.6
Male	31	107.4	1.76	34.7	64.4	22
Male	24	70	1.81	21.4	23.9	10
Male	18	78.9	1.905	21.7	41.9	16.7
Male	20	66	1.78	20.8	23	9.6
Male	20	63.6	1.743	20.9	32.4	13.6
Male	19	66.1	1.791	20.6	28.1	12
Male	21	68.4	1.72	23.1	31.8	13.4
Male	23	69.8	1.765	22.4	25.4	10.8
Male	18	94.1	1.982	24.0	32.9	13.8

Male	23	77.6	1.882	21.9	25.2	10.7	
Male	24	85.4	1.9	23.7	35.3	14.7	
Male	33	128	2	32.0	70	23	
Male	21	84.5	1.834	25.1	49.3	18.7	
Male	23	61.25	1.746	20.1	29.9	12.7	
Male	21	79.2	1.841	23.4	31.2	13.2	
Male	24	73.2	1.745	24.0	28.7	12.2	
Male	22	94	1.84	27.8	64	21.9	
Male	18	66.1	1.77	21.1	23.2	9.7	
Male	23	72.3	1.811	22.0	35.7	14.8	
Male	26	59.9	1.73	20.0	27.7	11.8	
Male	17	83.2	1.92	22.6	33.8	14.1	
Male	21	71	1.83	21.2	30.4	12.9	
Male	36	70	1.71	23.9	48.1	18.4	
Male	15	61.8	1.662	22.4	36	14.9	
Male	25	77.2	1.83	23.1	30.8	13	
Male	24	79.5	1.88	22.5	29.9	12.7	
Male	26	66.9	1.71	22.9	31.8	13.4	
Male	30	80.4	1.833	23.9	21.3	8.7	
Male	32	74.5	1.855	21.7	23.7	9.9	
Male	21	98.7	1.955	25.8	48.3	18.5	
Male	24	75.5	1.777	23.9	59	20.9	
Male	35	80.8	1.79	25.2	57.4	20.6	
Male	20	78.3	1.85	22.9	35.7	14.8	Males
Male	19	69.3	1.791	21.6	29.2	12.4	N=65
Mean	**24.03**	**74.56**	**1.78**	**23.42**	**42.17**	**18.67**	
S.D.	**4.95**	**13.87**	**0.10**	**2.73**	**15.59**	**7.18**	

Anthropometric and physiological profiles for Laser sailors reported in chapter 7.

Physiological profile: Laser Sailors (N=12)

Name	test	age	Ht	weight	BMI	fat %	VO2 @OBLA	Power @ OBLA	VO2 max	HR Max	max P	Leg strength at 600	Leg endur
	bike	27	1.87	83.8	24.0	11.5	49	3.88	65.2	184	487.4	933	66
	bike	25	1.78	77.5	24.5	14.7	44.3	3.42	52	184	362	882	40.5
	bike	16	1.89	71.8	20.1	9	47.6	3.8	58.2	188	366.4	762	
	run	23	1.775	78.3	24.9	12.1	52.2		61.6	196		1110	56.7
	bike	21	1.825	81.2	24.4	13.5	48.4	3.58	55.4	193	355	749	58.2
	bike	21	1.835	83.3	24.7	17.5	38.6	2.78	48.4	188	312.9	744	11.1
	bike	21	1.84	79.2	23.4	13.2	51.2	3.91	60.4	193	415.1	813	53.7
	bike	18.5	1.91	83.2	22.8	14.1	49	3.6	58.5	192	405.3	813	
	bike	30	1.835	78.1	23.2	8.2	52	4.22	67.4	197	458.4	955	48.2
	bike	22	1.76	82.6	26.7	17.6	46.8	3.65	64	191	486.2	867	58
	bike	22	1.785	73.9	23.2	16.8	43.4	3.36	62.4	199	402	918	45.1
	bike	17.1	1.896	86	23.9	16.6	46	3.72	54.2	188	413.8	742	29.5
MEAN		**22.0**	**1.83**	**79.9**	**23.8**	**13.7**	**47.38**	**3.63 ± 0.37 w/kg**	**58.98**	**191.1**	**405.9**	**857.3**	**46.7**
S.D.		**4.0**	**0.05**	**4.2**	**1.6**	**3.1**	**3.93**		**5.66**	**4.9**	**55.4**	**110.5**	**16.3**

	DYNO (means)			40 sec Anaerobic test		VO2 max L/min	O2 OB (l)	Power OBLA (W	Max Power (w/kg)
Name	Pull	Push	Legs	Peak	Mean	5.46	4.11	325.1	5.82
	85	83	255	875	678.2	4.03	3.43	265.1	4.67
	88	85	210			4.18	3.42	272.8	5.10
						4.82	4.09		
	92	95	178	633	515.7	4.50	3.93	290.7	4.37
	94	85	163	611	514.7	4.03	3.22	231.6	3.76
	102	86	222	613	553.1	4.78	4.06	309.7	5.24
	87	80	207	546	472	4.87	4.08	299.5	4.87
						5.26	4.06	329.6	5.87
	87	75	176	613	543.4	5.29	3.87	301.5	5.89
						4.61	3.21	248.3	5.44
	86	61		548	496.7	4.66	3.96	319.9	4.81
	73	72	158	563	512.4				
MEAN	**88.2**	**80.2**	**196.1**	**625.3**	**535.8**	**4.71**	**3.78**	**290.34**	**5.08**
S.D.	**7.8**	**9.8**	**33.2**	**106.3**	**62.8**	**0.48**	**0.36**	**32.21**	**0.67**

4th July 2003

Dear SUBJECT 1

Please find enclosed the results of your fitness tests conducted on the 29th June 2003.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test-srm bike	**11/6/02**	**20/9/01**	**13/12/00**
Power at OBLA:	**248.3 watts**	212.3 watts	212.7 watts	218.5 watts
Power/weight ratio:	**3.36 watts/kg**	2.91 w/kg	2.97 w/kg	3.16 w/kg
Oxygen consumption:	**43.4 ml/kg/min**	48.2 ml/kg	49.9 ml/kg	51.5 ml/kg
OBLA heart rate:	**176 b/min**	176 b/min	179 b/min	178 b/min
RER value	**0.91 – 0.98**	0.90 – 1.01	0.86 – 1.01	0.91 – 0.98
Body Weight	**73.9 kg**	72.9 kg	71.8 kg	69.1 kg

Test 2: Rowing VO2 max test:

	This Test-srm bike	**11/6/02**
VO2 max:	**62.4 ml/kg/min**	62.3 ml/kg/min
Max Heart rate:	**199 b/min**	198 b/min
Max Power:	**402.0 watts**	335.5 watts
Max power/weight:	**5.44 watts/kg**	4.60 watts/kg
OBLA VO2 + Max VO2:	**69.6 %**	77.3 %
Max RER:	**1.12**	1.11

Test 3: Isometric leg strength (quadriceps):

	This Test	**11/6/02**
Right leg:	935 Newtons	976 Newtons
Left leg:	899 Newtons	938 Newtons
Average leg strength	**918 Newtons**	**956 Newtons**

Test 4: Leg Endurance (left leg) at 600 Newtons:

	This test
Time to fatigue:	45.1 seconds
Mean force:	605 Newtons

Test 5: Dyno strength testing (all body):

	Bench pull	Bench push	Leg push
1.	92 kg	64 kg	137 kg
2.	84 kg	60 kg	141 kg
3.	82 kg	59 kg	141 kg
Mean:	**86 kg**	**61 kg**	**140 kg**
Performance Index (PI):	**5.15**	**3.58**	**7.89**
Mean PI (all sailors):	4.75	4.30	9.30

Test 6: 40 second sprint – rowing:

Peak power:	548 watts
Time to max:	@ 13.5 secs.
Performance Index (peak power):	30.7 (mean for others 34.4 with a peak of 47.3 – Laser sailor)
40 sec Average Power:	496.7
Performance Index (power/weight):	27.8 (mean for others 28.2 with a peak of 36.9 – Laser sailor)

Body fat results:	Biceps	5.0 mm	
	Triceps	10.4 mm	
	Sub-Scapular	11.8 mm	
	Supra-Iliac	15.0 mm	
	Total	42.2 mm	**Body fat 16.8%** (15.1 % June 02)

7th November 2003

Dear SUBJECT 2

Please find attached the results of your fitness tests conducted on the 7th November 2003.

Test 1: Cycling OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

Power at OBLA:	~ 320 watts
Power/weight ratio:	~ 3.72 watts/kg
VO2 at OBLA:	~ 46.0 ml/kg/min
Heart rate at OBLA:	~ 166 b/min
RER value:	0.86 – 0.93
Body Weight:	86.0 kg

Test 2: Cycling VO_2 max test:

VO2 max:	54.2 ml/kg/min
Max heart rate:	188 b/min
Max blood lactate:	6.51 mmol
Max Power:	413.8 watts
Max RER:	1.14
VO_2 OBLA/VO_2 max:	84.9 %

Test 3: Isometric leg strength (quadriceps):

Right leg:	766 Newtons
Left leg:	720 Newtons
Average:	**743 Newtons**

Test 4: Leg Endurance (right leg) at 600 Newtons:

Time to fatigue:	29.5 seconds
Mean force:	568 Newtons

Test 5: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	69 kg	70 kg	146 kg
2.	75 kg	73 kg	167 kg
3.	74 kg	74 kg	162 kg
Mean:	**73 kg**	**72 kg**	**158 kg**
Performance Index (PI):	**3.79**	**3.74**	**8.45**
Mean PI (all sailors):	**4.80**	**4.30**	**9.00**

Test 6: 40 second sprint – rowing:

Peak power:	563 watts
Time to max:	@ 19 secs
Performance Index (peak power):	28.5 (average 34.1)
40 sec Average Power:	512.4 watts
Performance Index (power/weight):	25.9 (average 28.3)

Body fat results:

Biceps	5.0 mm	
Triceps	11.4 mm	
Sub-Scapular	12.8 mm	
Supra-Iliac	12.2mm	
Total	41.4 mm	**Body fat: 16.6 %**

6th January 2004

Dear SUBJECT 3

Please find enclosed the results of your SRM cycling tests (OBLA & VO2 max tests) performed on the 21st November 2003. OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

Test 1: OBLA test:

	This Test	3/7/03	16/5/01	12/2/00
Power @ OBLA:	**330.0 watts**	308.8 watts	303.5 watts	344.5 watts
Power/Weight ratio @ OBLA:	**4.22 watts/kg**	3.93 watts/kg	3.83 watts/kg	4.31 w/kg
Oxygen consumption @ OBLA:	**52.0 ml/kg/min**	51.9 ml/kg	49.4 ml/kg	56.0 ml/kg
Heart Rate @ OBLA:	**155 b/min**	162 b/min	156 b/min	160 b/min
RER value:	**0.91 – 0.93**	0.93 – 0.99	0.95 – 1.03	0.91 – 0.97
Body Weight:	**78.1 kg**	78.5 kg	79.2 kg	79.9 kg

Test 2: VO2 max test:

	This Test	3/7/03
VO2 max:	**67.4 ml/kg/min**	64.8 ml/kg
Max Heart rate:	**197 b/min**	190 b/min
Max RER:	**1.19**	1.18
Max Power:	**458.4 watts**	427.6 watts
Max lactate:	**12.4 mmol**	11.2 mmol
OBLA VO2 / VO2 max:	**77.2%**	80.0 %

Test 3: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	90 kg	78 kg	172 kg
2.	84 kg	74 kg	182 kg
3.	86 kg	74 kg	175 kg
Mean:	**87 kg (91 kg)**	**75 kg (69 kg)**	**176 kg (143 kg)**
Performance Index (PI):	**4.85 (4.94)**	**4.21 (3.76)**	**9.82 (7.79)**
Mean PI (other sailors):	**4.85**	**4.30**	**9.20**

Test 4: 40 second sprint – rowing:

	This Test	3/7/03
Max power:	613 watts	627 watts
Time to max:	18 secs	11.0 secs
Performance index for peak power:	33.0	34.0
40 sec Average Power:	543.4 watts	fell off seat
Performance Index for average power:	29.3	fell off seat

Test 5: Isometric leg strength (quadriceps):

	This test
Right leg:	934 Newtons
Left leg:	976 Newtons
Average:	**955 Newtons**

Test 6: Leg Endurance (left leg) at 600 Newtons:

	This test
Time to fatigue:	48.2 seconds
Mean force:	642 Newtons

Body fat results:	Bicep	3.2 mm	
	Tricep	5.5 mm	
	Sub-Scapular	6.0 mm	
	Supra-Illiac	5.8 mm	
	Total	20.5 mm	Body fat: 8.2 % (9.8 % in July 2003)

11th February 2004

Dear SUBJECT 4

Please find enclosed the results of your fitness test conducted on the 2nd February 2004.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test-srm	8/5/03	1/8/02	8/3/02
Power/Treadmill speed at OBLA:	**325 watts**	14.6 km/h	~ 15.5 km/h	14.3 km/h
Power/weight @ OBLA:	**3.88 watts/kg**	******	******	******
Oxygen consumption at OBLA:	**49.0 ml/kg**	50.9 ml/kg	~ 52.0 ml/kg	50.4 ml/kg
OBLA heart rate:	**160 b/min**	168 b/min	~ 170 b/min	171 b/min
RER value:	**0.93 – 0.96**	0.95 – 1.02	0.91 – 0.97	0.97 – 1.02
Body Weight:	**83.8 kg**	81.0 kg	80.7 kg	81.5 kg

Test 2: Cycling VO2 max test:

	This test-srm	8/5/03	1/8/02	8/3/02
VO2 max:	**65.2 ml/kg**	65.0 ml/kg	62.2 ml/kg	65.7 ml/kg
Max Power:	**487.4 watts**	******	******	******
Max Heart rate:	**184 b/min**	191 b/min	188 b/min	188 b/min
OBLA VO2 ÷ Max VO2:	**75.2%**	78.3%	83.6 %	76.7 %
Max RER:	**1.16**	1.23	1.28	1.10

Test 3: 40 second sprint – rowing:

	This test	8/5/03
Max power:	875 watts	898 watts
Performance Index (peak power):	45.0	******
Time to max:	@ 10.2 secs	@ 8.6 secs
40 sec Average Power:	678.2 watts	700.6 watts
Performance Index (power/weight):	34.9	36.9

Test 4: Dyno strength testing (previous results in brackets):

	Bench pull	Bench push	Leg push
1.	91 kg	81 kg	253 kg
2.	84 kg	85 kg	256 kg
3.	81 kg	82 kg	256 kg
Mean:	**85 kg (83 kg)**	**83 kg (75 kg)**	**255 kg (210 kg)**
Performance Index (PI):	**4.68 (4.42)**	**4.37 (4.05)**	**13.17 (11.3)**
Mean PI (all Laser sailors):	**4.90**	**4.30**	**9.45**

Test 5: Leg strength (quadriceps):

	This test	8/5/03	1/8/02	8/3/02
Right leg (120° at knee):	1047 N	977 N	993 N	969 N
Left leg (120° at knee):	940 N	injured	1045 N	1005 N

Average strength:	**993 N**	**977 N**	**1019 N**	**987 N**

Test 6: Leg Endurance at 600 Newtons:

	This test
Time:	66.0 seconds
Mean force:	**579 Newtons**

Body fat results:

Bicep	3.4 mm	
Tricep	6.2 mm	
Sub-Scapular	8.8 mm	
Supra-Iliac	8.7 mm	
Total	27.1 mm	**Body fat: 11.5%** (9.0 % May 03)

21st October 2003

Dear SUBJECT 5

Please find enclosed the results of your fitness test conducted on the 15th October 2003.

Test 1: SRM cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test-srm bike	21/3/03-srm	10/6/02	5/1/0101
Power at OBLA:	**265.3 watts**	300 watts	245.3 watts	262.4 watts
Power to weight:	**3.42 watts/kg**	3.82 watts/kg	3.14 watts/kg	3.40 watts/kg
Oxygen consumption:	**44.3 ml/kg/min**	48.0 ml/kg	39.7 ml/kg	41.1 ml/kg
OBLA heart rate:	**169 b/min**	171 b/min	160 b/min	171 b/min
RER range:	**0.98 – 1.02**	0.98 – 1.02	*** – 1.02	0.94 – 1.04
Body Weight:	**77.5 kg**	78.7 kg	78.1 kg	77.0 kg

Test 2: Cycling VO2 max test:

VO2 max:	**52.0 ml/kg/min**	55.3 ml/kg	58.1 ml/kg/min
Max Heart rate:	**184 b/min**	188 b/min	******
Max Power:	**362.0 watts**	383.5 watts	388.5 watts
OBLA VO2 ÷ Max VO2:	**85.2 %**	86.7 %	68.3 %
Max RER:	**1.05**	1.15	1.11

Test 3: Isometric leg strength (quadriceps):

	This Test	21/3/03	10/6/02	5/1/01
Left leg (120° at knee):	895 Newtons	968 N	997 N	962 N
Right leg (120° at knee):	868 Newtons	975 N	989 N	920 N
Average:	**882 Newtons**	**972 N**	**993 N**	**941 N**

Test 4: Leg Endurance (right leg) at 600 Newtons:

	This test	21/3/03
Time to fatigue:	40.5 seconds	32.6 seconds
Mean force:	580 Newtons	602.3 Newtons

Test 5: Dyno strength testing (previous test results in brackets):

	Bench pull	Bench push	Leg push
1.	89 kg	85 kg	210 kg
2.	88 kg	82 kg	214 kg
3.	87 kg	83 kg	206 kg
Mean:	**88 kg (83 kg)**	**85 kg (83 kg)**	**210 kg (164 kg)**
Performance Index (PI):	**4.83 (4.72)**	**4.77 (4.56)**	**12.00 (8.91)**
Mean PI (all sailors):	**4.80**	**4.30**	**11.00**

Body fat results:	Bicep	4.0 mm	
	Tricep	9.0 mm	
	Sub-Scapular	10.0 mm	
	Supra-Iliac	12.5 mm	
	Total	35.5 mm	**Body fat:14.7%** (12.5% in March 03)

10th October 2002

Dear SUBJECT 6

Please find enclosed the results of your fitness test conducted on the 4th October 2002.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test-bike	28/6/02-row
Rowing power at OBLA:	272.8 watts	~230 watts
Power/weight ratio @ OBLA:	3.80 watts/kg	3.31 watts/kg
Oxygen consumption at OBLA:	47.6 ml/kg/min	~49 ml/kg/min
OBLA heart rate:	169 b/min	~173 b/min
RER range:	0.98 – 1.03	******
Body Weight	71.8 kg	69.5 kg
Height:	1.896 m	1.882 m (1.841 m Dec 2001)

Test 2: Cycling VO2 max test:

VO2 max:	58.2 ml/kg/min	56.3 ml/kg/min
Max Heart rate:	188 beats/min	187 b/min
Max Power:	366.4 watts	294 watts
OBLA VO2 ÷ Max VO2:	81.8 %	87.0%
Max RER:	1.15	******

Test 3: Isometric leg strength (quadriceps):

	This Test
Right leg (120° at knee joint):	728 Newtons
Left leg (120° at knee joint):	796 Newtons
Average:	**762 Newtons**

Test 4: Upper-body strength (isometric):

	This Test
Right arm isometric strength:	690 Newtons
Left arm isometric strength:	820 Newtons
Average:	**755 Newtons**

Body composition:

Body fat results:	Bicep	3.8 mm	
	Tricep	7.1 mm	
	Sub-Scapular	6.2 mm	
	Supra-Iliac	4.9 mm	
	Total	22.0 mm	Body fat: 9.0 % (7.2 % June 02 – Mark)

16th December 2003

Dear SUBJECT 7

Please find enclosed the results of running tests (OBLA & VO2 max) performed on the 15th December 2003. OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

Test 1: OBLA test:

	This Test	**31/3/03**	**27/8/02**	**22/3/01**
Running speed at OBLA:	**14.4 km/h**	14.2 km/h	14.5 km/h	14.7 km/h
Oxygen consumption:	**52.2 ml/kg/min**	53.0 ml/kg	50.7 ml/kg	50.5 ml/kg
OBLA heart rate:	**182 b/min**	182 b/min	180 b/min	176 b/min
RER value	**0.91 – 1.02**	0.92 – 1.04	0.87 – 1.04	0.88 – 0.96
Body Weight	**78.3 kg**	77.0 kg	78.7 kg	78.3 kg

Test 2: Running VO2 max test:

	This Test	**31/3/03**	**27/8/02**	**22/3/01**
VO2 max:	**61.6 ml/kg/min**	58.4 ml/kg	59.1 ml/kg	60.4 ml/kg
Max Heart rate:	**196 b/min**	195 b/min	194 b/min	190 b/min
OBLA VO2 ÷ Max VO2:	**84.7%**	90.7%	85.8 %	83.6%
Max RER:	**1.12**	1.06	1.11	1.01

Test 3: Isometric leg strength (quadriceps):

	This Test	**31/3/03**	**27/8/02**
Right leg (120° at knee):	******	1125 Newtons	1147 Newtons
Left leg (120° at knee):	******	1094 Newtons	1110 Newtons
Average strength	******	**1110 Newtons**	**1129 Newtons**

Test 4: Leg Endurance at 600 Newtons:

56.7 seconds (582 Newtons)

Test 5: Dyno strength testing (previous results in brackets):

	Bench pull	Bench push	Leg push
1.	95 kg	93 kg	177 kg
2.	93 kg	97 kg	177 kg
3.	89 kg	94 kg	180 kg
Mean:	**92 kg (90 kg)**	**95 kg (93 kg)**	**178 kg (157 kg)**
Performance Index (PI):	**5.12 (5.28)**	**5.22 (5.12)**	**9.69 (8.80)**
Mean PI (other sailors):	4.90	4.25	9.00

Test 6: 40 second sprint – rowing:

Max power:	**633 watts**
Time to max:	**@ 12 secs** (needs to be > 705 watts)
Performance Index:	**34.1** (needs to be > 38)
40 sec Average Power:	**515.7 watts** (needs to be > 600)
Performance Index (power/weight):	**28.1** (needs to be > 32)

Blood Profile:	Haemoglobin:	16.1	Good (normal male values 14-18)
	Haematocrit:	43.6%	Good (normal male range 38-52%)
Body fat results:	Biceps	3.4 mm	
	Triceps	7.2 mm	
	Sub-Scapular	8.0 mm	
	Supra-Iliac	9.8 mm	
	Total	28.4 mm	**Body fat 12.1 %** (10.7 % March 2003)

9th May 2003

Dear SUBJECT 8

Please find enclosed the results of your fitness test conducted on the 7th May 2003.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test- srm	**7/5/03-srm**	**30/4/02**	**21/10/01**
Cycling power @ OBLA:	**291.0 watts**	292 watts	270.1 watts	208.2 watts
Power/weight ratio @ OBLA:	**3.58 watts/kg**	3.66 w/kg	3.39 w/kg	2.48 w/kg
Oxygen consumption @ OBLA:	**48.4 ml/kg/min**	48.0 ml/kg	43.7 ml/kg	36.8 ml/kg
Heart Rate @ OBLA:	**177 b/min**	186 b/min	178 b/min	162 b/min
RER value:	**0.93 – 1.06**	0.87 – 1.01	0.92 – 1.02	0.90 – 1.04
Body Weight:	**81.2 kg**	79.7 kg	79.6 kg	83.9 kg

Test 2: Cycling VO2 max test:

VO2 max:	**55.4 ml/kg/min**	56.8 ml/kg	57.5 ml/kg
Max Heart rate:	**193 b/min**	205 b/min	207 beats/min
Max Power:	**366.0 watts**	392.4 watts	413.3 watts
OBLA VO2 ÷ Max VO2:	**87.4 %**	84.5 %	76.0 %
Max RER:	**1.15**	1.16	1.12

Test 3: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	96 kg	86 kg	155 kg
2.	95 kg	87 kg	178 kg
3.	90 kg	83 kg	156 kg
Mean:	**94 kg**	**85 kg**	**163 kg**
Performance Index (PI):	**5.05**	**4.57**	**9.35**
Mean PI (other sailors):	4.70	4.30	9.00

Test 4: 40 second sprint – rowing:

Max power:	611 watts
Time to max:	@ 14.8 secs
40 sec Average Power:	514.7 watts
Performance Index (power/weight):	28.0

Isometric leg strength (quadriceps):

	This Test	**7/5/03**	**30/4/02**	**21/10/01**
Right leg (120° at knee):	737 Newtons	776 Newtons	815 Newtons	753 Newtons
Left leg (120° at knee):	760 Newtons	810 Newtons	798 Newtons	785 Newtons
Average strength	**749 Newtons**	**793 Newtons**	**807 Newtons**	**769 Newtons**

Leg Endurance (not performed this time):
Left leg at 600 Newtons = 58.2 seconds (x=569 Newtons)

Body fat results:

Biceps	3.7 mm	
Triceps	8.0 mm	
Sub-Scapular	11.4 mm	
Supra-Iliac	9.0 mm	
Total	32.1 mm	**Body fat:13.5 %** (14.8% Nov 02)

6th November 2003

Dear SUBJECT 9

Please find attached the results of your fitness tests conducted on the 5th November 2003.

Test 1: Cycling OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test - srm	14/10/03 - srm	27/10/00
Power at OBLA:	231.5 watts	225.2 watts	217.5 watts
Power/weight ratio:	2.78 watts/kg	2.78 watts/kg	2.73 w/kg
VO2 at OBLA:	38.6 ml/kg/min	38.1 ml/kg/min	38.2 ml/kg/min
Heart rate at OBLA:	166 b/min	169 b/min	164 b/min
RER value:	0.94 – 1.08	0.98 – 1.14	0.92 – 1.06
Body Weight:	83.3 kg	80.9 kg	79.5 kg

Test 2: Cycling VO_2 max test:

	This test - srm	14/10/03 - srm
VO2 max:	48.4 ml/kg/min	48.2 ml/kg/min
Max heart rate:	188 b/min	192 b/min
Max blood lactate:	8.12 mmol	8.97 mmol
Max Power:	312.9 watts	306.8 watts
Max RER:	1.15	1.17
VO_2 OBLA/VO_2 max:	79.7 %	79.0 %

Test 3: Isometric leg strength (quadriceps):

	This test	14/10/03
Right leg:	750 Newtons	844 Newtons
Left leg:	738 Newtons	834 Newtons
Average:	**744 Newtons**	**839 Newtons**

Test 4: Leg Endurance (right leg) at 600 Newtons:

Time to fatigue:	11.1 seconds
Mean force:	574 Newtons

Test 5: Dyno strength testing:

	Bench pull	Bench push	Leg push	3/3/04
1.	105 kg	84 kg	154 kg	218
2.	100 kg	88 kg	162 kg	227
3.	100 kg	85 kg	162 kg	221
Mean:	**102 kg**	**86 kg**	**159 kg**	222 kg (159 kg)
Performance Index (PI):	**5.42**	**4.55**	**8.37**	11.73 (8.37)
Mean PI (all sailors):	**4.80**	**4.30**	**9.00**	9.80

Test 6: 40 second sprint – rowing:

Peak power:	613 watts
Time to max:	@ 10 secs
Performance Index (peak power):	31.7
40 sec Average Power:	553.1 watts
Performance Index (power/weight):	28.6

Body fat results:

Biceps	4.6 mm	
Triceps	12.8 mm	
Sub-Scapular	14.2 mm	
Supra-Iliac	12.9mm	
Total	44.5 mm	**Body fat: 17.5 %** (15.3 % in Oct 02)

26th April 2004

Dear SUBJECT 10

Please find enclosed the results of your fitness test conducted on the 19th April 2004.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test	**21/02/04**	**2/10/02**	**23/2/02**
Cycling power @ OBLA:	**309.5 watts**	332.0 watts	~320 watts	~300 watts
Power/Weight ratio @ OBLA:	**3.91 watts/kg**	4.10 watts/kg	4.06 watts/kg	3.76 w/kg
Oxygen consumption @ OBLA:	**51.2 ml/kg/min**	52.5 ml/kg	~50.5 ml/kg	~ 49 ml/kg
Heart Rate @ OBLA:	**173 b/min**	173 b/min	180 b/min	180 b/min
RER value:	**0.87 – 1.00**	0.92 – 1.03	0.87 – 0.98	0.94 – 0.98
Body Weight:	**79.2 kg**	80.9 kg	78.7 kg	79.8 kg

Test 2: Cycling VO2 max test:

	This Test	**21/02/04**	**2/10/02**
VO2 max:	**60.4 ml/kg/min**	59.8 ml/kg	58.0 ml/kg
Max Heart rate:	**193 b/min**	190 b/min	197 beats/min
Max Power:	**415.1 watts**	434.5 watts	416.1 watts
OBLA VO2 ÷ Max VO2:	**84.8 %**	87.8 %	87.1 %
Max RER:	**1.13**	1.20	1.16
Max blood lactate:	**8.67 mmol**	8.42 mmol	8.25 mmol

Test 3: Dyno Strength testing (previous results in brackets):

	Bench pull	Bench push	Leg push
1.	90 kg	79 kg	206 kg
2.	91 kg	79 kg	205 kg
3.	81 kg	81 kg	210 kg
Mean:	**87 kg (91 kg)**	**80 kg (74 kg)**	**207 kg (165 kg)**
P.I.	**4.86 (5.00)**	**4.33 (4.00)**	**11.22 (8.80)**
Mean P.I.	**4.85**	**4.35**	**11.50**

Test 4: 40 second sprint – rowing:

Peak power:	546 watts	(aiming for ~ 710 watts)
Time to max:	@ 11.3 secs	(aiming for < 10 secs)
Performance Index (peak power):	29.2	(aiming for ~ 38)
40 sec Average Power:	472 watts	(aiming for ~ 600 watts)
Performance Index (power/weight):	25.2	(aiming for ~ 32)

Test 5: Isometric leg strength (quadriceps):

	This Test	**21/02/04**	**2/10/02**	**23/2/02**
Right leg (120° at knee joint):	845 Newtons	812 Newtons	719 Newtons	826 Newtons
Left leg (120° at knee joint):	780 Newtons	710 Newtons	822 Newtons	794 Newtons
Average:	**813 Newtons**	**761 Newtons**	**771 Newtons**	**810 Newtons**

Test 6: Leg Endurance (right leg) at 600 Newtons:

	This Test	**21/02/04**
Time to fatigue:	53.7 secs	53.4 seconds
Mean force:	596 Newtons	595 Newtons

Body fat results:			
	Biceps	3.6 mm	
	Triceps	6.3 mm	
	Sub-Scapular	11.5 mm	
	Supra-Iliac	9.8 mm	
	Total	31.2 mm	**Body fat: 13.2%** (15.0 % Feb 03)

16th April 2002

Dear SUBJECT 12

Please find enclosed the results of your fitness test conducted on the 12th April 2002.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test	**18/12/01**	**27/7/01**
Cycling power at OBLA:	301.6 watts	288.5 watts	291.1 watts
Power/weight ratio:	3.65 w/kg	3.39 w/kg	3.42 w/kg
Oxygen consumption:	46.8 ml/kg/min	45.3 ml/kg	48.0 ml/kg
OBLA heart rate:	168 b/min	175 b/min	182 b/min
RER value	0.83 – 0.98	0.90 – 1.00	0.84 – 0.95
Body Weight	82.6 kg	84.4 kg	85.0 kg

Test 2: Cycling VO2 max test:

VO2 max:	64.0 ml/kg/min
Max Heart rate:	191 beats/min
Max Power:	486.2 watts
OBLA VO2 ÷ Max VO2:	73.1 %
Max RER:	1.15

Test 3: Isometric leg strength (quadriceps):

	This Test	18/12/01
Right leg (120° at knee):	858 Newtons	728 Newtons
Left leg (120° at knee):	875 Newtons	836 Newtons
Average strength	**867 Newtons**	**782 Newtons**

Test 4: Upper-body strength (isometric):

	This Test	18/12/01	27/7/01
Right arm strength:	956 Newtons	******	839 Newtons
Left arm strength:	857 Newtons	******	871 Newtons
Average strength	907 Newtons	******	855 Newtons

Test 6: Leg Endurance (right leg) at 600 Newtons:

	This Test
Time to fatigue:	58.0 secs
Mean force:	606.1 Newtons

9th October 2002

Dear , SUBJECT 11

Please find enclosed the results of your fitness test conducted on the 4th October 2002.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test-bike	28/6/02-row	5/11/01
Rowing power at OBLA:	~ 300 watts	******	~ 270 watts
Power/weight ratio @ OBLA:	3.60 watts/kg	******	3.19 watts/kg
Oxygen consumption at OBLA:	~49 ml/kg/min	******	~ 50 ml/kg/min
OBLA heart rate:	~180 b/min	******	186 beats/min
RER range:	0.90 – 0.99	******	0.86 – 1.04
Body Weight	83.2 kg	80.2 kg	84.7 kg

Test 2: Cycling VO2 max test:

VO2 max:	58.5 ml/kg/min	59.8 ml/kg/min
Max Heart rate:	192 beats/min	193 b/min
Max Power:	405.3 watts	336 watts
OBLA VO2 ÷ Max VO2:	83.7 %	******
Max RER:	1.13	******
Max blood lactate:	7.55 mmol	******

Test 3: Isometric leg strength (quadriceps):

	This Test	28/6/02	5/11/01
Right leg (120° at knee joint):	998 Newtons	******	933 Newtons
Left leg (120° at knee joint):	874 Newtons	******	772 Newtons
Average:	**936 Newtons**	******	**853 Newtons**

Test 4: Upper-body strength (isometric):

	This Test	28/6/02	5/11/01
Right arm isometric strength:	818 Newtons	******	605 Newtons
Left arm isometric strength:	808 Newtons	******	648 Newtons
Average:	**813 Newtons**	******	**627 Newtons**

Body composition:

Body fat results:	Bicep	5.2 mm	
	Tricep	8.2 mm	
	Sub-Scapular	9.2 mm	
	Supra-Iliac	11.2 mm	
	Total	33.8 mm	Body fat: 14.1% (11.7% June 02 – Mark) (14.0% Nov 01 – me)

Chapter 3 and 7: Anthropometric and physiological profiles of dinghy sailors.

Anthropometric and physiological profiles for Finn sailors reported in chapter 7.

Physilogical profile: Finn Sailors (N=8)

Name	test	age	Ht	weight	BMI	fat %	VO2 @OBLA	Power @ OBLA	VO2 max	HR Max	max P	Leg strength at 600	Leg endur
1	bike	26.5	1.83	100.1	29.89	22.7	39.6	3.03	45.2	201	384.4	951	52
2	bike	26.2	1.83	94	28.07	15.7	40.2	2.94	44.9	191	361	981	85.3
3	bike	22	1.825	94	28.22	21.1	32.7	2.34	47.8	204	354.9	981	63.2
4	row	21.1	1.955	102.8	26.9	14	48.5	3.26	55	192	468.4	1274	62.3
5	row	18.4	2.01	93.9	23.24	19.8	43.5	2.52	55.1	209	429.5	918	38.3
6	bike	24.4	1.865	98	28.18	16	43.6	3.17	56.7	197	432.6	1245	122
7	bike	18.6	1.98	94.1	24	19.8	40.9	3.04	56.5	203	407.9	941	42.7
8	bike	23	1.85	90	26.3	19.5	33.5	2.06	47.6	195	329.1	1083	56.7
MEAN		**22.5**	**1.89**	**95.9**	**26.8**	**18.6**	**40.3**	**2.73 w/kg**	**51.1**	**199.0**	**396.0**	**1046.8**	**65.3**
SD		**3.11**	**0.08**	**4.12**	**2.26**	**3.00**	**5.25**	**0.49 w/kg**	**5.18**	**6.30**	**46.86**	**140.32**	**27.04**

	DYNO (means)			40 sec Anaerobic test		VO2 max L/min	B L/min	Power	Max Power (w/kg)
Name	Pull	Push	Legs	Peak	Mean	4.52	3.96	303.3	3.84
1	102	102	183			4.22	3.78	276.4	3.84
2	113	108	250	701.0	553.0	4.49	3.07	220.0	3.78
3	97	88	194	768.0		5.65	4.99	335.1	4.56
4	102	93	277	691.0	634.2	5.17	4.08	236.6	4.57
5	97	78	190	831.0	703.2	5.56	4.27	310.7	4.41
6	117	108	221	877.0	652.1	5.32	3.85	286.1	4.33
7	91	79	238	670.0	597.0	4.28	3.02	185.4	3.66
8	106	102	210	898.0	700.6				
						4.9	**3.9**	**269.2**	**4.1**
MEAN	**103**	**94.8**	**220.4**	**776.6**	**640.0**	**0.59**	**0.64**	**50.81**	**0.38**
SD	**8.64**	**12.15**	**32.77**	**93.33**	**58.76**				

18th February 2003

Dear SUBJECT ①

Please find attached the results of your fitness tests conducted on the 17th February 2003.

Test 1: Cycling OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test - srm	29/10/02-srm	30/10/01	27/2/01
Power at OBLA:	**303.0 watts**	~ 310 watts	266.9 watts	282.2 watts
Power/Weight ratio:	**3.03 watts/kg**	~ 3.12 watts/kg	2.61 w/kg	2.82 w/kg
VO2 at OBLA:	**39.6 ml/kg/min**	~ 40 ml/kg	40.2 ml/kg	38.6 ml/kg
Heart rate at OBLA:	**184 b/min**	185 b/min	168 b/min	174 b/min
RER value:	**0.90 – 1.02**	0.91 – 0.99	0.91 – 1.00	0.90 – 1.10
Body Weight:	**100.1 kg**	99.5 kg	102.2 kg	99.9 kg

Test 2: Cycling VO_2 max test:

	This test	**29/10/02-srm**
VO2 max:	**45.2 ml/kg/min**	45.8 ml/kg/min
Max heart rate:	**201 b/min**	205 b/min
Max blood lactate:	******	6.92 mmol
Max Power:	**384.4 watts**	383.8 watts
Max RER:	**1.11**	1.13
VO_2 OBLA/VO_2 max:	**87.6%**	87.3 %

Test 3: Isometric leg strength (quadriceps):

	This test	**29/10/02**	**30/10/01**	**12/7/01**
Right leg:	947 Newtons	937 Newtons	913 Newtons	869 Newtons
Left leg:	955 Newtons	1019 Newtons	1028 Newtons	887 Newtons
Average:	**951 Newtons**	**978 Newtons**	**971 Newtons**	**878 Newtons**

Test 4: Leg Endurance (left leg) at 666 Newtons:

	This test	**29/10/02**
Time to fatigue:	52.0 seconds	49.6 seconds
Mean force:	646 Newtons	649 Newtons

Test 5: Upper-body strength (isometric):

	This test	**29/10/02**	**30/10/01**	**12/7/01**
Right arm:	1073 Newtons	947 Newtons	849 Newtons	750 Newtons
Left arm:	1031 Newtons	1019 Newtons	936 Newtons	734 Newtons
Average:	**1052 Newtons**	**983 Newtons**	**893 Newtons**	**742 Newtons**

Test 6: Dyno Strength testing:

	Bench pull	Bench push	Leg push
1.	106 kg	100 kg	191 kg
2.	99 kg	104 kg	176 kg
3.	102 kg	101 kg	183 kg
Mean:	**102 kg**	**102 kg**	**183 kg**

Body fat results:

Biceps	7.0 mm	
Triceps	15.5 mm	
Sub-Scapular	20.5 mm	
Supra-Iliac	25.5 mm	
Total	68.5 mm	**Body fat: 22.7 %** (23.2 % in Oct 02)

15th October 2003

Dear SUBJECT (2)

Please find attached the results of your fitness tests conducted on the 11th October 2003

Test 1: Cycling OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test -srm	**10/4/02- srm**	**25/7/00**	**29/6/00**
Power at OBLA:	**~ 270 watts**	238.3 watts	280.0 watts	292 watts
Power/weight ratio:	**2.94 watts/kg**	2.55 w/kg	3.46 w/kg	3.61 w/kg
VO_2 at OBLA:	**~ 40.2 ml/kg/min**	38.4 ml/kg	48.3 ml/kg	47.5 ml/kg
OBLA heart rate:	**~ 173 b/min**	158 b/min	164 b/min	170 b/min
RER value:	**0.92 – 1.03**	0.86 – 1.06	0.94 – 1.08	0.94 – 1.07
Body Weight:	**94.0 kg**	93.6 kg	80.4 kg	80.6 kg

Test 2: Cycling VO_2 max test:

	This test	**10/4/02**	**25/7/00**	**29/6/00**
VO2 max:	**44.9 ml/kg/min**	45.7 ml/kg	58.7 ml/kg	56.8 ml/kg
Max heart rate:	**191 b/min**	184 b/min	194 b/min	189 b/min
Max blood lactate:	**8.22 mmol**	9.74 mmol	7.90mmol	7.69 mmol
Max Power:	**361.0 watts**	345.1 watts	421.2 watts	395.9 watts
VO_2 OBLA/VO_2 max:	**89.5 %**	84.0%	82.3 %	83.6 %

Test 3: Isometric leg strength (quadriceps):

	This test	**11/10/02**	**10/4/02**	29/6/00
Left leg (120°):	1002 Newtons	860 Newtons	858 Newtons	884 NEWTONS
Right leg (120°):	959 Newtons	880 Newtons	815 Newtons	822 NEWTONS
Average:	**981 Newtons**	**870 Newtons**	**836 Newtons**	853 NEWTONS

Test 4: Leg Endurance (left leg) at 666 Newtons:

	This test
Time to fatigue:	85.3 seconds
Mean force:	635 Newtons

Test 5: Upper-body strength (isometric):

	This test	**11/10/02**	**10/4/02**
Right arm:	1056 Newtons	952 Newtons	1018 Newtons
Left arm:	1010 Newtons	793 Newtons	950 Newtons
Average:	**1033 Newtons**	**873 Newtons**	**984 Newtons**

Test 6: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	115 kg	106 kg	242 kg
2.	112 kg	108 kg	255 kg
3.	114 kg	110 kg	253 kg
Mean:	**113 kg**	**108 kg**	**250 kg**

Body fat results:

	Biceps	5.0 mm		
	Triceps	9.6 mm		
	Sub-Scapular	11.0 mm		
	Supra-Iliac	13.0 mm		
	Total	38.6 mm	**Body fat: 15.7 %**	(16.8% Oct 02) (17.5% April 02)

17th October 2003

Dear SUBJECT 3

Please find attached the results of your fitness tests conducted on the 13th October 2003.

Test 1: **Cycling OBLA test** (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test-srm bike	29/5/03-srm	25/7/01-monark	17/10/00-monark
Power @ OBLA:	**220.3 watts**	241.2 watts	258 watts	229.3 watts
Power/weight ratio:	**2.34 w/kg**	2.55 watts/kg	2.70 w/kg	2.44 w/kg
Oxygen consumption:	**32.7 ml/kg/min**	35.0 ml/kg	37.5 ml/kg	36.2 ml/kg
OBLA heart rate:	**170 b/min**	177 b/min	184 b/min	190 b/min
RER value:	**0.89 – 0.99**	0.89 – 1.00	0.93 – 1.01	0.88 – 0.99
Body Mass:	**94.0 kg**	94.6 kg	95.6 kg	93.9 kg

Test 2: Cycling VO_2 max test:

	This test	29/5/03
VO2 max:	47.8 ml/kg/min	46.7 ml/kg/min
Max heart rate:	204 b/min	201 b/min
Max blood lactate:	9.71 mmol	8.62 mmol
Max Power:	354.9 watts	359.3 watts
Max RER:	1.13	1.14
VO_2 OBLA/VO_2 max:	68.4%	74.9%

Test 3: Isometric leg strength (quadriceps):

	This test	29/5/03	25/7/01
Right leg:	977 Newtons	****** (pain)	948 Newtons
Left leg:	977 Newtons	915 Newtons (pain)	952 Newtons
Average:	**981 Newtons**	**915 Newtons (pain)**	**950 Newtons**

Test 4: Leg Endurance (left leg) at 666 Newtons:

Time:	63.2 seconds
Average Force:	634 Newtons

Test 5: Dyno strength testing (all body):

	Bench pull	Bench push	Leg push
1.	100 kg	91 kg	200 kg
2.	97 kg	87 kg	195 kg
3.	95 kg	86 kg	188 kg
Mean:	**97 kg**	**88 kg**	**194 kg**
Performance Index (PI):	**4.74**	**4.32**	**9.49**
Mean PI (all sailors):	4.75	4.30	9.30

Test 6: 40 second sprint – rowing:

	This test	29/5/03
Peak power:	768 watts	804 watts
Time to max:	@ 14.0 secs	@ 12.4 secs
Performance Index (peak power):	36.6	38.1
40 sec Average Power:	fell off seat (again)	fell off seat
Performance Index (power/weight):	fell off seat (again)	fell off seat

Body fat results:

Bicep	6.8 mm	
Tricep	12.2 mm	
Sub-Scapular	14.8 mm	
Supra-Iliac	<u>26.1 mm</u>	
Total	<u>59.9 mm</u>	Body fat: 21.1 % (21.3 % May 03)

22nd January 2004

Dear , SUBJECT (4)

Please find enclosed the results of your fitness tests performed on the 21st January 2004.

Test 1: Rowing OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test	19/7/01	26/10/00	15/12/99
Rowing power @ OBLA:	**335 watts**	306.0 watts	325.6 watts	299.8 watts
Power/weight @ OBLA:	**3.26 watts/kg**	2.98 watts/kg	3.07 watts/kg	2.99 watts/kg
Oxygen @ OBLA:	**48.5 ml/kg/min**	45.3 ml/kg	45.8 ml/kg	50.9 ml/kg
Heart Rate @ OBLA:	**181 b/min**	175 b/min	178 b/min	182 b/min
RER @ OBLA:	**0.88 – 0.98**	0.87 – 1.02	0.89 – 0.96	0.82 – 0.97
Body Weight:	**102.8 kg**	106.2 kg	106.2 kg	100.3 kg

Test 2: Rowing VO2 max	**This Test**
VO2 max:	**55.0 ml/kg/min**
Max power:	**468.4 Watts**
Max power/weight:	**4.56 watts/kg**
Max heart rate:	**192 b/min**
VO2 OBLA/VO2 max:	**88.2%**
Max RER:	**1.11**

Test 3: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	105 kg	88 kg	248 kg
2.	101 kg	92 kg	293 kg
3.	100 kg	99 kg	289 kg
Mean:	**102 kg**	**93 kg**	**277 kg**
Performance Index (PI):	**4.63**	**4.37**	**12.93**
Mean PI (all Finn/Star sailors):	**4.90**	**4.60**	**10.50**

Test 4: 40 second sprint – rowing:

Peak power:	691 watts
Time to max:	@ 37 secs
Performance Index (peak power):	30.5 (looking for 38 = 860 watts)
40 sec Average Power:	634.2 watts
Performance Index (power/weight):	28 (looking for 32 = 725 watts)

Test 5: Leg strength:

	This test	19/7/01
Right leg:	1316 Newtons	1281 Newtons
Left leg:	1231 Newtons	1173 Newtons
Average:	**1274 Newtons**	**1227 Newtons**

Test 6:Leg Endurance at 666 Newtons:

Time to fatigue:	62.3 seconds
Mean force held:	619.2 Newtons

Body fat results:			
	Bicep	3.2 mm	
	Tricep	10.4 mm	
	Sub-Scapular	10.9 mm	
	Supra-Illiac	9.0 mm	
	Total	33.5 mm	**Body fat:14.0 %** (16.4 % July 01)

4th September 2003

Dear SUBJECT (5)

Please find enclosed the results of your fitness tests (OBLA & VO2 max tests) performed on the Concept rower performed on the 3rd Sept 2003. OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

Test 1: OBLA test:

Power @ OBLA:	**236.9 watts**
Power/Weight ratio @ OBLA:	**2.52 watts/kg**
Oxygen consumption @ OBLA:	**43.5 ml/kg/min**
Heart Rate @ OBLA:	**187 b/min**
RER value:	**0.91 – 1.03**
Body weight:	**93.9 kg**

Test 2: VO2 max test:

VO2 max:	**55.1 ml/kg/min**
Max Heart rate:	**209 b/min**
Max RER:	**1.23**
Max Power:	**429.5 watts**
Max lactate:	**11.6 mmol**
OBLA VO2 / VO2 max:	**78.9 %**

Test 3: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	100 kg	77 kg	199 kg
2.	100 kg	77 kg	190 kg
3.	92 kg	80 kg	182 kg
Mean:	**97 kg**	**78 kg**	**190 kg**
Performance Index (PI):	**4.79**	**3.83**	**9.53**
Mean PI (other sailors):	**4.75**	**4.30**	**9.30**

Test 4: 40 second sprint – rowing:

Peak power:	**831 watts**
Time to max:	**@ 16.0 secs**
Performance Index (peak power):	**39.8 (mean for others 34.5 with a peak of 47.3 – Laser sailor)**
40 sec Average Power:	**703.2**
Performance Index (power/weight):	**33.7 (mean for others 28.4 with a peak of 36.9 – Laser sailor)**

Test 5: Isometric leg strength (quadriceps):

Left leg (120°):	939 Newtons
Right leg (120°):	897 Newtons
Average:	**918 Newtons**

Test 6: Leg Endurance (left leg) at 666 Newtons:

	This test
Time to fatigue:	38.3 seconds
Mean force:	631 Newtons

Body fat results:			
	Bicep	5.0 mm	
	Tricep	11.6 mm	
	Sub-Scapular	11.0 mm	
	Supra-Illiac	26.5mm	
	Total	54.1 mm	Body fat: 19.8 %

8th April 2001

Dear SUBJECT 6

Please find enclosed the results of your fitness tests performed on the 6th April 2001.

Test 1: OBLA test (Onset of Blood Lactate Accumulation) on the Bike. OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test	**3/2/01**	**15/5/00**	**20/2/00**
Power @ OBLA:	**~311 watts**	270.8 watts	300 watts	275 watts
Power/Weight ratio:	**3.17 watts/kg**	2.77 watts/kg	3.09 watts/kg	2.86 watts/kg
VO2 @ OBLA:	**~43.6 ml/kg/min**	37.7 ml/kg	41.8 ml/kg	37.5 ml/kg
Heart rate @ OBLA:	**171 b/min**	169 b/min	168 b/min	166 b/min
RER value:	**0.88 – 0.94**	0.93 – 1.06	0.96 – 1.01	0.99 – 1.05
Body Mass:	**98.0 kg**	97.7 kg	97.0 kg	96.0 kg

Test 2: Rowing VO2 max test:

	This test	**3/2/01**	**15/5/00**	**20/2/00**
VO2 max:	**56.7 ml/kg/min**	Not tested	53.4 ml/kg	47.2 ml/kg
Max Heart rate:	**197 b/min**	******	196 b/min	197 b/min
Max Power:	**432.6 watts**	******	423.6 watts	393.8 watts
OBLA VO2 ÷ Max VO2:	**76.9%**	******	78.2%	79.5%
Max RER:	**1.13**	******	1.25	1.32

Test 3: 40 second sprint – rowing:

	This test	**3/2/01**	**15/5/00**
Max power:	687 watts	781 watts	877 watts
Performance Index (peak power):	31.8	36.3	40.9
Time to max:	@ 16.6 secs	@ 9.0 secs	@ 8.1 secs
40 sec Average Power:	568 watts	652.1 watts	568.3 watts
Performance Index (power/weight):	26.3	30.3	26.5 (fell off)

Test 4: Dyno Strength testing:

	Bench pull	Bench push	Leg push
1.	115 kg	110 kg	204 kg
2.	115 kg	105 kg	223 kg
3.	120 kg	107 kg	237 kg
Mean force:	**117 kg** (109 kg)	**108 kg** (108 kg)	**221 kg** (215 kg)
Performance Index (PI):	**5.60** (5.17)	**5.13** (5.07)	**11.06** (10.48)
Mean PI	**4.70**	**4.30**	**9.30**

Test 5: Isometric leg strength (quadriceps):

	This test	**15/5/00**	**20/2/00**
Max strength right leg:	1289 N	1209 N	1299 N
Max strength left leg:	1198 N	1202 N	1079 N
Average:	**1245 N**	**1205 N**	**1189 N**

Test 6: Leg Endurance at 666 Newtons:

	This test	**15/5/00**	**20/2/00**
Time:	122 seconds	111 seconds	100.5 + seconds
Mean force:	632 Newtons	643 Newtons	640 Newtons

2nd April 2004

Dear . SUBJECT 7

Please find enclosed the results of your fitness tests (OBLA & VO2 max tests) performed on the SRM bike on the 26th March 2004. OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

Test 1: OBLA test:

Power @ OBLA:	**286.1 watts**
Power/Weight ratio @ OBLA:	**3.04 watts/kg**
Oxygen consumption @ OBLA:	**40.9 ml/kg/min**
Heart Rate @ OBLA:	**169 b/min**
RER value:	**0.98 – 1.03**
Body weight:	**94.1 kg**

Test 2: VO2 max test:

VO2 max:	**56.5 ml/kg/min**
Max Heart rate:	**203 b/min**
Max RER:	**1.13**
Max Power:	**407.9 watts**
Max lactate:	**11.4 mmol**
OBLA VO2 / VO2 max:	**72.4 %**

Test 3: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	95 kg	82 kg	236 kg
2.	92 kg	78 kg	238 kg
3.	87 kg	78 kg	240 kg
Mean:	**91 kg**	**79 kg**	**238 kg**
Performance Index (PI):	**4.52**	**3.90**	**11.43**
Mean PI (other sailors):	**4.90**	**4.60**	**11.20**

Test 4: 40 second sprint – rowing:

Peak power:	**670 watts**
Time to max:	**@ 25.0 secs**
Performance Index (peak power):	**31.9 (mean for others 34.5 with a peak of 47.3)**
40 sec Average Power:	**597**
Performance Index (power/weight):	**28.4 (mean for others 28.4 with a peak of 36.9)**

Test 5: Isometric leg strength (quadriceps):

Left leg (120°):	980 Newtons
Right leg (120°):	902 Newtons
Average:	**941 Newtons**

Test 6: Leg Endurance (left leg) at 666 Newtons:

	This test
Time to fatigue:	42.7 seconds
Mean force:	638 Newtons

Body fat results:			
	Bicep	5.0 mm	
	Tricep	11.6 mm	
	Sub-Scapular	11.0 mm	
	Supra-Illiac	26.5mm	
	Total	54.1 mm	Body fat: 19.8 %

11th December 2002

Dear SUBJECT 8

The results of your fitness tests performed on the 31st November 2001.

OBLA TEST: OBLA test (Onset of Blood Lactate Accumulation) on the cycling ergometer. OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test
Power at OBLA:	186.1 watts
Power/weight ratio @ OBLA:	2.06 watts/kg
Oxygen consumption at OBLA:	33.5 ml/kg/min
OBLA heart rate:	157 b/min
RER range:	0.91 – 1.01
Body Weight	90.0 kg

VO2 max TEST:

VO2 max:	47.6 ml/kg/min
Max power:	329.1 watts
Max Heart rate:	195 b/min
Max RER:	1.25
OBLA VO2 / VO2 max:	73.5 %

Test 3: Isometric leg strength (quadriceps):

Max strength right leg:	1131 Newtons
Max strength left leg:	1035 Newtons
Average:	**1083 Newtons**

Test 4: Leg Endurance at 666 Newtons:

Time:	56.7 seconds
Mean force:	655 Newtons

Test 5: Dyno strength testing (all body):

	Bench pull	Bench push	Leg push
1.	106 kg	100 kg	202 kg
2.	106 kg	104 kg	215 kg
3.	104 kg	99 kg	213 kg
Mean:	**106 kg**	**102 kg**	**210 kg**
Performance Index (PI):	**5.00**	**4.77**	**11.30**
Mean PI (all sailors):	**4.75**	**4.33**	**9.30**

Test 5: 40 second sprint – rowing:

Max power:	898 watts
Time to max:	@ 8.6 secs
40 sec Average Power:	700.6 watts
Performance Index (power/weight):	36.9

Body fat results:

Biceps	5.2 mm
Triceps	9.8 mm
Sub-Scapular	11.5 mm
Supra-Iliac	26.0 mm
Total	52.5 mm

Body fat: 19.5%

Anthropometric and physiological profiles for Europe sailors reported in chapter 7.

Physilogical profile: Europe Sailors (N=10)

Name	test	age	Ht	weight	BMI	fat %	VO2 @ OBLA	Power @ OBLA	VO2 max	HR Max	max P	Leg st	leg end (at 450 newton)
1	row	21	1.628	61.9	23.4	29.2	41	2.7	46.9	200	233	679	55.1
2	run	22.3	1.738	66.8	22.1	28.5	39		47.5	199		757	47.1
3	row	22.9	1.638	62.4	23.3	30.7	35.6	2.33	42.2	197	210.5	529	31.1
4	bike	24.9	1.709	69	23.6	29.3	35.1	2.84	44.4	199	274.3	722	38.6
5	run	24.6	1.64	65.6	24.4	25.9	42.4		47.3	190		702	61.7
6	run	23	1.77	65.8	21.0	23.9	38.7		43.8	204		730	56.7
7	row	19.8	1.691	67.3	23.5	29.8	40.7	2.64	45.7	204	252	742	44.8
8	bike	23	1.67	63.5	22.8	26.3	36.5	2.68	44.6	218	259	697	48.8
9	bike	32	1.68	67.6	24.0	25.8	40.4	3.05	48.8	172	286.5	506	38.4
10	bike	27	1.69	74.9	26.2	30.1	32.7	2.54	39.2	192	278	729	70.4
		24.05	**1.69**	**66.48**	**23.42**	**27.95**	**38.21**	**2.68**	**45.04**	**197.50**	**256.2**	**679.30**	**49.27**
		3.45	**0.05**	**3.76**	**1.38**	**2.29**	**3.11**	**0.23**	**2.86**	**11.80**	**27.00**	**88.37**	**11.91**

	DYNO			40 sec Anaerobic test		VO2 max L.min	VO2 OB L.min	Power	max Power (rel)
	Pull	Push	Legs	Peak	Mean	2.90	2.54	167.1	3.76
1	57	58	151	386	329	3.17	2.61		
2	67	68	171			2.63	2.22	145.4	3.37
3	54	55	114			3.06	2.42	196.0	3.98
4	50	42	110			3.10	2.78		
5	66	70	177	376	321	2.88	2.55		
6	50	50	174	343	305	3.08	2.74	177.7	3.74
7	56	46	179	446	356.6	2.83	2.32	170.2	4.08
8	53	53	114	394	341.7	3.30	2.73	206.2	4.24
9	51	50	125			2.94	2.45	190.2	3.71
10	71	60	195	512	435	**2.99**	**2.54**	**179.0**	**3.84**
	57.5	**55.20**	**151.00**	**409.5**	**348.1**	**0.19**	**0.19**	**20.42**	**0.28**
	7.71	**9.02**	**32.35**	**60.3**	**46.1**				

24th March 2004

Dear SUBJECT 1

Please find enclosed the results of your recent fitness tests performed on the 11th March 2004.

Test 1: Rowing OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test –row	9/10/03
Rowing power @ OBLA:	**167 watts**	145.0 watts
Power/weight @ OBLA:	**2.70 watts/kg**	2.32 watts/kg
Oxygen consumption @ OBLA:	**41.0 ml/kg/min**	27.5 ml/kg/min
Heart Rate @ OBLA:	**185 b/min**	187 b/min
RER values:	**0.92 – 1.00**	0.95- 0.98
Body Weight:	**61.9 kg**	62.5 kg

Test 2: VO2 max

	This test –row	9/10/03
VO2 max:	**46.9 ml/kg/min**	34.9 ml/kg/min
Max power:	**233 watts**	237.2 watts
Max power/weight:	**3.76 watts/kg**	3.80 watts/kg
Max heart rate:	**200 b/min**	206 b/min
VO2 OBLA/VO2 max:	**87.4%**	78.8 %
Max RER:	**1.13**	1.21

Test 3: Dyno strength testing (previous results in brackets):

	Bench pull	Bench push	Leg push
1.	57 kg	55 kg	150 kg
2.	57 kg	59 kg	153 kg
3.	56 kg	59 kg	151 kg
Mean:	**57 kg (56 kg)**	**58 kg (48 kg)**	**151 kg (120 kg)**
Performance Index (PI):	**3.59 (3.82)**	**3.72 (3.07)**	**9.64 (7.95)**
Mean PI (other sailors):	**3.60**	**3.20**	**7.60**

Test 4: 40 second sprint – rowing:

	This test	9/10/03
Peak power:	386 watts	340watts
Time to max:	@ 14.8 secs	@ 15.0 secs
Performance Index (peak power):	24.3	21.3
40 sec Average Power:	329 watts	304.7 watts
Performance Index (av power):	20.7	19.1

Test 5: Isometric leg strength (quadriceps):

	This test	**9/10/03**
Right leg (120° at knee joint):	690 Newtons	666 Newtons
Left leg (120° at knee joint):	668 Newtons	657 Newtons
Average:	**679 Newtons**	**661 Newtons**

Test 6: Hiking endurance at 450 N:

	This test	9/10/03
Time:	55.1 secs	44.2 secs
Force:	447 Newtons	440 Newtons

Body fat results:	Biceps	6.6 mm	
	Triceps	19.2 mm	
	Sub-Scapular	12.2 mm	
	Supra-Iliac	21.0 mm	
	Total	59.0 mm	**Body fat: 29.2 %** (31.6% Sept 03)

2nd December 2003

Dear SUBJECT 2

Please find enclosed the results of your recent fitness tests performed on the 4th Nov 2003.

Test 1: Running OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test -run	8/3/02 -run	27/3/01 -run	17/1/00 -bike
Running speed @ OBLA:	**12.0 km/h**	12.2 km/h	~12.9 km/h	137.9 watts
Oxygen consumption @ OBLA:	**39.0 ml/kg/min**	41.1 ml/kg	~43 ml/kg	29.8 ml/kg
Heart Rate @ OBLA:	**189 b/min**	182 b/min	195 b/min	165 b/min
RER values:	**0.91- 1.00**	0.91 – 1.04	0.92 – 0.97	0.96 – 1.00
Body Weight:	**66.8 kg**	67.7 kg	67.3 kg	67.0 kg

Test 2: VO2 max	**This Test**
VO2 max:	47.5 ml/kg/min
Max speed & gradient:	13.5 km/h at 6%
Max heart rate:	199 b/min
VO2 OBLA/VO2 max:	86.5%
Max RER:	1.09

Test 3: Dyno strength testing (previous results in brackets):

	Bench pull	Bench push	Leg push
1.	67 kg	65 kg	170 kg
2.	567 kg	69 kg	173 kg
3.	566 kg	69 kg	171 kg
Mean:	**67 kg**	**68 kg**	**171 kg**
Performance Index (PI):	**4.24**	**4.30**	**10.77**
Mean PI (other sailors):	**3.60**	**3.20**	**7.60**

Test 4: Leg strength:		
Right leg (120° at knee joint):	742 Newtons	770 Newtons
Left leg (120° at knee joint):	771 Newtons	736 Newtons
Average:	**757 Newtons**	**753 Newtons**

Test 5:Leg Endurance at 450 Newtons:

47.1 seconds (446.0 Newtons)

Body fat results:			
	Biceps	7.0 mm	
	Triceps	17.5mm	
	Sub-Scapular	13.2 mm	
	Supra-Iliac	18.5 mm	
	Total	56.2 mm	**Body fat: 28.5%** (27.2 % March 02)

19th December 2002

Dear SUBJECT(3)

Please find enclosed the results of your recent fitness tests (25th November 2002).

Test 1: Rowing OBLA Test: (OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate):

	This Test	3/5/02	2/8/01
Rowing power @ OBLA:	**145.3 watts**	150.8 watts	148.9 watts
Power/weight ratio:	**2.33 watts/kg**	2.34 watts/kg	2.39 watts/kg
Oxygen consumption @ OBLA:	**35.6 ml/kg/min**	34.8 ml/kg	37.3 ml/kg
Heart Rate @ OBLA:	**187 b/min**	179 b/min	184 b/min
RER range:	**0.80 – 1.07**	0.90 – 1.03	0.75 – 1.03
Body Weight:	**62.4 kg**	64.5 kg	62.2 kg

Test 2: Rowing VO2 max test:

	This Test	3/5/02
VO2 max:	******	42.2 ml/kg/min
Max heart rate:	******	197 beats/min
Max power:	******	210.5 watts
Max power/weight	******	3.26 watts/kg
OBLA VO2 ÷ Max VO2:	******	82.5 %
Max RER:	******	1.09 (not a true max test)

Test 3 : Dyno Strength testing:

	Bench pull	Bench push	Leg push
1.	55 kg	57 kg	118 kg
2.	53 kg	55 kg	117 kg
3.	54 kg	54 kg	114 kg
Mean:	**54 kg**	**55 kg**	**114 kg**

Test 4: Isometric upper-body strength:

	This Test	3/5/02	2/8/01
Right arm isometric strength:	563 Newtons	570 Newtons	513 Newtons
Left arm isometric strength:	494 Newtons	513 Newtons	435 Newtons
Average:	**529 Newtons**	**542 Newtons**	**474 Newtons**

Test 5: Isometric leg strength (quadriceps):

	This Test	3/5/02	2/8/01
Right leg (120° at knee joint):	627 Newtons	637 Newtons	598 Newtons
Left leg (120° at knee joint):	618 Newtons	674 Newtons	652 Newtons
Average:	**624 Newtons**	**656 Newtons**	**625 Newtons**

Test 6: Hiking endurance @450 Newtons:

Time:	31.1 seconds
Mean force:	433 Newtons

Body fat results: Bicep	12.0 mm	
Tricep	20.6 mm	
Sub-Scapular	14.2 mm	
Supra-Iliac	18.5 mm	
Total	65.3 mm	Body fat: 30.7% (33.5 % May 02)

24th April 2003

Dear SUBJECT ⑥

Please find enclosed the results of your recent fitness tests performed on the 21st March 2003.

Test 1: Cycling OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test	4/11/02	14/12/01	31/7/00
Cycling power @ OBLA:	**195.9 watts**	174.3 watts	197.1 watts	184.8 watts
Power/Weight ratio @ OBLA:	**2.84 watts/kg**	2.53 watts/kg	2.81 w/kg	2.69 w/kg
Oxygen consumption @ OBLA:	**35.1 ml/kg/min**	31.0 ml/kg	34.8 ml/kg	34.0 ml/kg
Heart Rate @ OBLA:	**173 b/min**	166 b/min	173 b/min	175 b/min
RER values:	**0.89 – 1.05**	0.72 – 1.00	0.89 – 0.99	0.78 – 0.97
Body Weight:	**69.0 kg**	68.8 kg	70.2 kg	68.8 kg

Test 2: VO2 max	**This Test**	
VO2 max:	44.4 ml/kg/min	41.2 ml/kg
Max power:	274.3 watts	280.8 Watts
Max power/weight:	4.08 watts/kg	4.08 watts/kg
Max heart rate:	199 b/min	199 b/min
VO2 OBLA/VO2 max:	75.2%	73.8%
Max RER:	1.18	1.18

Test 3: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	51 kg	42 kg	107 kg
2.	51 kg	41 kg	111 kg
3.	48 kg	43 kg	111 kg
Mean:	**50 kg**	**42 kg**	**110 kg**
Performance Index (PI):	**2.99**	**2.52**	**6.51**
Mean PI (other sailors):	**3.32**	**3.02**	**7.57**

Test 4: Upper-body strength:

	This test	4/11/02	14/12/01	31/7/01
Right arm isometric strength:	732 Newtons	700 Newtons	575 Newtons	591 Newtons
Left arm isometric strength:	711 Newtons	651 Newtons	599 Newtons	592 Newtons
Average:	**722 Newtons**	**676 Newtons**	**587 Newtons**	**591 Newtons**

Test 5: Leg strength:

	This test	4/11/02	14/12/01	31/7/01
Right leg:	623 Newtons	636 Newtons	711 Newtons	676 Newtons
Left leg:	626 Newtons	578 Newtons	680 Newtons	642 Newtons
Average:	**625 Newtons**	**607 Newtons**	**696 Newtons**	**660 Newtons**

Test 6:Leg Endurance at 450 Newtons:

38.6 seconds (442.0 Newtons) – This Test
40.2 seconds (421.9 Newtons) – Nov 02

Body fat results:			
	Biceps	6.0 mm	
	Triceps	24.0 mm	
	Sub-Scapular	15.5 mm	
	Supra-Iliac	14.0 mm	
	Total	59.9 mm	**Body fat: 29.3 %** (31.4 % Nov 02)

27th February 2004

Dear SUBJECT 6

Please find enclosed the results of your fitness tests conducted on the 11th February 2004 and some training advice for the coming months

Test 1: Running OBLA Test: (OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate):

	This test	17/10/03	15/1/02
Running speed at OBLA:	**~ 13.0 km/h**	10.8 km/h	12.2 km/h
Oxygen consumption @ OBLA:	**~42.4 ml/kg/min**	35.5 ml/kg	41.6 ml/kg
OBLA heart rate:	**~175 b/min**	171 b/min	187 b/min
RER value:	**0.88 – 0.96**	0.91 – 1.06	0.90 – 1.01
Body Weight:	**65.6 kg**	64.0 kg	64.7 kg

Test 2: Running VO_2 max test:

	This test	17/10/03
VO2 max:	**47.3 ml/kg/min**	42.4 ml/kg
Max Heart rate:	**190 b/min**	197 beats/min
Max run speed/gradient:	**12 km/h @ 9%**	12 km/h @ 7.8%
OBLA VO_2 ÷ Max VO_2:	**89.6%**	83.7 %
Max RER:	**1.22**	1.16
Max lactate:	**9.1 mmol**	10.2 mmol

Test 3: 40 second sprint – rowing:

	This test	17/10/03
Max power:	376 watts @13.3 secs	325 watts at 15 secs
Max power as Performance Index:	22.8	20.0
40 sec Average Power:	321 watts	276 watts
Av power as Performance Index:	19.5	17.0

Test 4: Dyno Strength testing (previous results in brackets):

	Bench pull	Bench push	Leg push
1.	66 kg	69 kg	177 kg
2.	66 kg	70 kg	173 kg
3.	66 kg	71 kg	181 kg
Mean:	**66 kg (54 kg)**	**70 kg (55 kg)**	**177 kg (111 kg)**
Performance Index:	**4.00 (3.39)**	**4.30 (3.45)**	**10.97 (6.84)**
Mean female PI:	3.60	3.20	8.00

Test 5: Isometric leg strength (quadriceps):

	This test	17/10/03	15/1/02
Right leg (120° at knee joint):	691 newtons	651 Newtons	674 Newtons
Left leg (120° at knee joint):	712 Newtons	651 Newtons	686 Newtons
Average:	**702 Newtons**	**651 Newtons**	**680 Newtons**

Test 6: Leg Endurance (right leg) at 450 Newtons

	This test	17/10/03
Time to fatigue:	61.7 secsonds	64.1 seconds
Mean force:	431 Newtons	417 Newtons

Body fat results:	Biceps	8.2 mm	
	Triceps	14.7 mm	
	Sub-Scap	9.8 mm	
	Supra-Iliac	14.0 mm	
	TOTAL	46.7 mm	**Body fat 25.9%**

21st March 2004

Dear SUBJECT 6

Please find enclosed the results of recent fitness tests (26th February 2004).

Test 1: OBLA test: OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test	15/8/01
Running speed @ OBLA:	**~ 12.6 km/h**	11.9 km/h
Oxygen consumption @ OBLA:	**~38.7 ml/kg/min**	37.2 ml/kg/min
Heart Rate @ OBLA:	**194 b/min**	203 beats/min
RER range:	**0.87 – 0.98**	0.87 – 0.99
Body Weight:	**65.8 kg**	70.5 kg

Test 2: Running VO_2 max test:

	This test
VO2 max:	**43.8 ml/kg/min**
Max Heart rate:	**204 b/min**
Max run speed/gradient:	**12 km/h @ 9.6%**
OBLA VO_2 ÷ Max VO_2:	**88.3%**
Max RER:	**1.22**
Max lactate:	**8.25 mmol**

Test 3: 40 second sprint – rowing:

	This test
Max power:	343 watts @ 14.0 secs
Max power as Performance Index:	20.8 (looking for 34 = 550 watts)
40 sec Average Power:	305 watts
Av power as Performance Index:	19.5 (looking for 28 = 460 watts)

Test 4: Dyno Strength testing:

	Bench pull	Bench push	Leg push
1.	51 kg	50 kg	168 kg
2.	50 kg	50 kg	176 kg
3.	48 kg	50 kg	179 kg
Mean:	**50 kg**	**50 kg**	**174 kg**
Performance Index:	**3.09**	**3.03**	**10.83**
Mean female PI:	3.60	3.20	8.42

Test 5: Isometric leg strength (quadriceps):

	This test	15/8/01
Left leg (120° at knee):	724 Newtons	866 Newtons
Right leg (120° at knee):	736 Newtons	818 Newtons
Mean	**730 Newtons**	**842 Newtons**

Test 6: Leg Endurance (right leg) at 450 Newtons

	This test
Time to fatigue:	56.7 secsonds
Mean force:	430.5 Newtons

Body fat results:

Bicep	3.8 mm
Tricep	15.8 mm
Sub-Scapular	8.8 mm
Supra-Iliac	12.2 mm
Total	40.6 mm

Body fat: 23.9% (26.6 % Aug 01)

2nd March 2004

Dear SUBJECT 7

Please find enclosed the results of your recent fitness tests performed on the 11th February 2004.

Test 1: Rowing OBLA test (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test –row	29/7/03 - row	7/11/02 - row	30/10/01– row
Rowing power @ OBLA:	**~178 watts**	151.2 watts	165.2 watts	202 watts
Power/weight @ OBLA:	**2.64 watts/kg**	2.07 watts/kg	2.21 watts/kg	2.95 watts/kg
Oxygen consumption @ OBLA:	**~ 40.7 ml/kg/min**	34.8 ml/kg	34.1 ml/kg	42.5 ml/kg
Heart Rate @ OBLA:	**193 b/min**	188 b/min	193 b/min	178 b/min
RER values:	**0.90 – 0.98**	1.00 – 1.04	0.91- 0.99	0.90-1.02
Body Weight:	**67.3 kg**	73.2 kg	74.5 kg	68.5 kg

Test 2: VO2 max

	This test –row	29/7/03 - row	7/11/02 - row	30/10/01– row
VO2 max:	**45.7 ml/kg/min**	40.0 ml/kg	36.5 ml/kg	52.5 ml/kg
Max power:	**252.0 watts**	210.5 watts	203.5 watts	240.9 watts
Max power/weight:	**3.74 watts/kg**	2.88 watts/kg	2.73 watts/kg	3.52 watts/kg
Max heart rate:	**204 b/min**	198 b/min	~203 b/min	198 b/min
VO2 OBLA/VO2 max:	**89.0 %**	87.0%	93.4 %	81.0%
Max RER:	**1.12**	1.02	1.01	1.05

Test 3: Dyno strength testing (previous results in brackets):

	Bench pull	Bench push	Leg push
1.	59 kg	47 kg	163 kg
2.	53 kg	47 kg	188 kg
3.	55 kg	44 kg	187 kg
Mean:	**56 kg (51 kg)**	**46 kg (50 kg)**	**179 kg (125 kg)**
Performance Index (PI):	**3.52 (3.04)**	**2.80 (3.04)**	**11.20 (7.21)**
Mean PI (other female sailors):	3.70	3.20	8.20

Test 4: 40 second sprint – rowing:

	This test	29/7/03
Peak power:	466 watts	418 watts
Time to peak power:	@14.0 secs	@ 39.0 secs
Performance Index (peak power):	27.8	23.5
40 sec Average Power:	fell off	356.6 watts
Performance Index (av. power):	fell off	20.1

Test 5: Leg strength:

	This test	29/7/03	7/11/02
Right leg (120° at knee joint):	766 Newtons	741 Newtons	664 Newtons
Left leg (120° at knee joint):	717 Newtons	702 Newtons	626 Newtons
Average:	**742 Newtons**	**722 Newtons**	**645 Newtons**

Test 6: Leg Endurance (right leg) at 450 Newtons:

	This test	29/7/03	7/11/02
Time to fatigue:	44.8 seconds	38.4 seconds	29.3 seconds
Mean force:	427.0 Newtons	427.0 Newtons	439.4 Newtons

Body fat results:	Biceps	11.6 mm	
	Triceps	17.6 mm	
	Sub-Scapular	15.2 mm	
	Supra-Iliac	17.0 mm	
	Total	61.4 mm	**Body fat: 29.8% (34.4% July 03)**
			(34.7% Nov 02)

29th March 2004

Dear. SUBJECT 8

Please find enclosed:

The results of rowing tests (OBLA & VO2 max) performed on the 24th March 2004. OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

Test 1: OBLA test:

	This Test-srm	30/7/03-row	6/5/03-row	13/5/99-bike
Power @ OBLA:	**190.3 watts**	197.1 watts	182 watts	163.0 Watts
Power/weight ratio:	**2.54 watts/kg**	2.60 watts/kg	2.52 watts/kg	2.33 W/kg
Oxygen consumption:	**32.7 ml/kg/min**	39.3 ml/kg	38.5 ml/kg	33.2 ml/kg
Heart Rate @ OBLA:	**173 b/min**	178 b/min	178 b/min	174 b/min
RER value:	**0.94 – 0.96**	0.88 – 0.94	0.83 – 1.01	1.05 – 1.18
Body Weight:	**74.9 kg**	75.9 kg	72.3 kg	69.9 kg

Test 2: Maximal oxygen uptake test (VO2 max):

	This Test-srm	30/7/03-row	6/5/03-row
VO_2 max:	**39.2 ml/kg/min**	44.2 ml/kg	43.2 ml/kg/min
Max Heart rate:	**192 b/min**	198 b/min	194 b/min
Max Power:	**278.0 watts**	271.0 watts	277.1 watts
Max RER:	**1.18**	1.05	1.15
OBLA VO_2 / VO_2 max:	**83.4%**	88.9 %	89.1 %

Test 3: Dyno strength testing (last test results in brackets):

	Bench pull	Bench push	Leg push
1.	71 kg	62 kg	202 kg
2.	71 kg	60 kg	197 kg
3.	70 kg	58 kg	185 kg
Mean:	**71 kg (68 kg)**	**60 kg (58 kg)**	**195 kg (137 kg)**
Performance Index (PI):	**3.94 (3.79)**	**3.44 (3.30)**	**11.21 (7.97)**
Mean PI (other female sailors):	3.60	3.30	9.00

Test 4: 40 second sprint – rowing:

	This Test	30/7/03	6/5/03
Peak power:	512	463 watts	427 watts
Time to peak power:	@ 11.8 secs	@ 10.0 secs	@ 9.9 secs
Performance Index (peak power):	28.4	25.5	21.8
40 sec Average Power:	435	411.7 watts	383.9 watts
Performance Index (av. power):	24.1	22.6	21.8

Test 5: Leg strength (quadriceps):

	This test	30/7/03	6/5/03
Right leg (120° at knee joint):	740 Newtons	701 Newtons	661 Newtons
Left leg (120° at knee joint):	717 Newtons	710 Newtons	705 Newtons
Average:	**729 Newtons**	**705 Newtons**	**686 Newtons**

Test 6: Leg Endurance (right leg) at 450 Newtons:

	This test	30/7/03	6/5/03
Time to fatigue:	Not performed	110.4 seconds	60.7 seconds
Mean force:	Not performed	426.0 Newtons	439.4 Newtons

Body fat results:

Biceps	7.1 mm	
Triceps	19.2 mm	
Sub-Scapular	17.5 mm	
Supra-Iliac	19.1 mm	
Total	62.9 mm	**Body fat: 30.1%**
		(31.0 % July 03)
		(32.3% May 03)

4th June 2003

Dear SUBJECT (9)

Please find enclosed the results of your fitness tests (28th May 2003) and some training advice for the coming months.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This Test-srm	**2/10/03**	**28/1/02**	**2/8/01**
Power at OBLA:	**~170 watts**	136.0 watts	170.7watts	180.0 watts
Power/weight ratio @ OBLA:	**2.68 watts/kg**	2.18 watts/kg	2.78 w/kg	2.83 w/kg
Oxygen consumption @ OBLA:	**~36.5 ml/kg/min**	28.3 ml/kg	35.6 ml/kg	37.0 ml/kg
OBLA heart rate:	**195 b/min**	185 b/min	187 b/min	200 b/min
RER value:	**0.96 – 1.01**	0.92-1.05	0.89 – 1.04	0.98 – 1.03
Body Weight:	**63.5 kg**	62.4 kg	61.5 kg	62.2 kg

Test 2: Cycling SRM VO_2 max test:

VO2 max:	**44.6 ml/kg/min**
Max power:	**259.0 watts**
Max power/weight:	**4.08 watts/kg**
Max heart rate:	**218 b/min**
Max RER:	**1.24**
Max lactate:	**8.82 mmol**
VO_2 OBLA/VO_2 max:	**81.8%**

Test 3: Dyno Strength testing:

	Bench pull	Bench push	Leg push
1.	55 kg	55 kg	116 kg
2.	52 kg	53 kg	112 kg
3.	52 kg	52 kg	114 kg
Mean:	**53 kg**	**53 kg**	**114 kg**
Performance Index:	**3.41**	**3.41**	**7.19**
Mean female PI:	3.50	3.20	7.60

Test 4: 40 second sprint – rowing:

Max power:	394 watts @ 8.1 seconds
Max power as performance index:	24.4
40 sec Average Power:	341.7 watts
Average power as Performance Index:	21.2

Test 5: Leg strength (quadriceps):

	This Test	**28/1/02**	**2/8/01**
Right leg (120° at knee joint):	583 Newtons	654 Newtons	612 Newtons
Left leg (120° at knee joint):	610 Newtons	668 Newtons	581 Newtons
Average:	**697 Newtons**	**661 Newtons**	**597 Newtons**

Test 6: Leg Endurance (right leg) at 450 Newtons:

	This test
Time to fatigue:	48.8 seconds
Mean force:	429.9 Newtons

Body fat results:	Bicep	7.7 mm	
	Triceps	19.0 mm	
	Sub-Scapular	9.5 mm	
	Supra-Iliac	<u>12.0 mm</u>	
	Total	<u>48.2 mm</u>	**Body fat:26.3%** (28.9 % in Oct 03)

9th October 2002

Dear SUBJECT 10

Please find enclosed the results of your fitness tests conducted on the 2nd October 2002 and some training advice for the coming months.

Test 1: Cycling OBLA (Onset of Blood Lactate Accumulation test). OBLA is a standard reference point equivalent to 4.0 mmol of blood lactate.

	This test	16/2/01
Power at OBLA:	**206.1 watts**	190.0 watts
Power/weight ratio at OBLA:	**3.05 w/kg**	2.69 w/kg
Oxygen consumption at OBLA:	**40.4 ml/kg**	37.7 ml/kg
OBLA heart rate:	**154 b/min**	155 b/min
RER value:	**0.91 – 1.05**	0.96-1.04
Body Weight:	**67.6 kg**	70.7 kg

Test 2: Cycling VO2 max test:

VO2 max:	**48.8 ml/kg/min**
Max heart rate:	**172 beats/min**
Max power:	**286.5 watts**
OBLA VO2 ÷ Max VO2:	**82.8%**
Max RER:	**1.20**

Test 3: Dyno strength testing:

	Bench pull	Bench push	Leg push
1.	54 kg	54 kg	125 kg
2.	49 kg	48 kg	128 kg
3.	49 kg	49 kg	122 kg
Mean:	**51 kg**	**50 kg**	**125 kg**
Performance Index (PI):	**3.04**	**3.04**	**7.21**
Mean PI (other female sailors):	**3.56**	**3.26**	**7.70**

Test 4: Isometric upper-body strength:

	This test	20/12/01
Right arm isometric strength:	444 Newtons	421 Newtons
Left arm isometric strength:	491 Newtons	424 Newtons
Average:	**466 Newtons**	**422 Newtons**

Test 5: Isometric leg strength (quadriceps):

	This test	20/12/01
Right leg (120° at knee joint):	545 Newtons	584 Newtons
Left leg (120° at knee joint):	467 Newtons	559 Newtons
Average:	**506 Newtons**	**572 Newtons**

Test 6: Leg Endurance (right leg) at 450 Newtons:

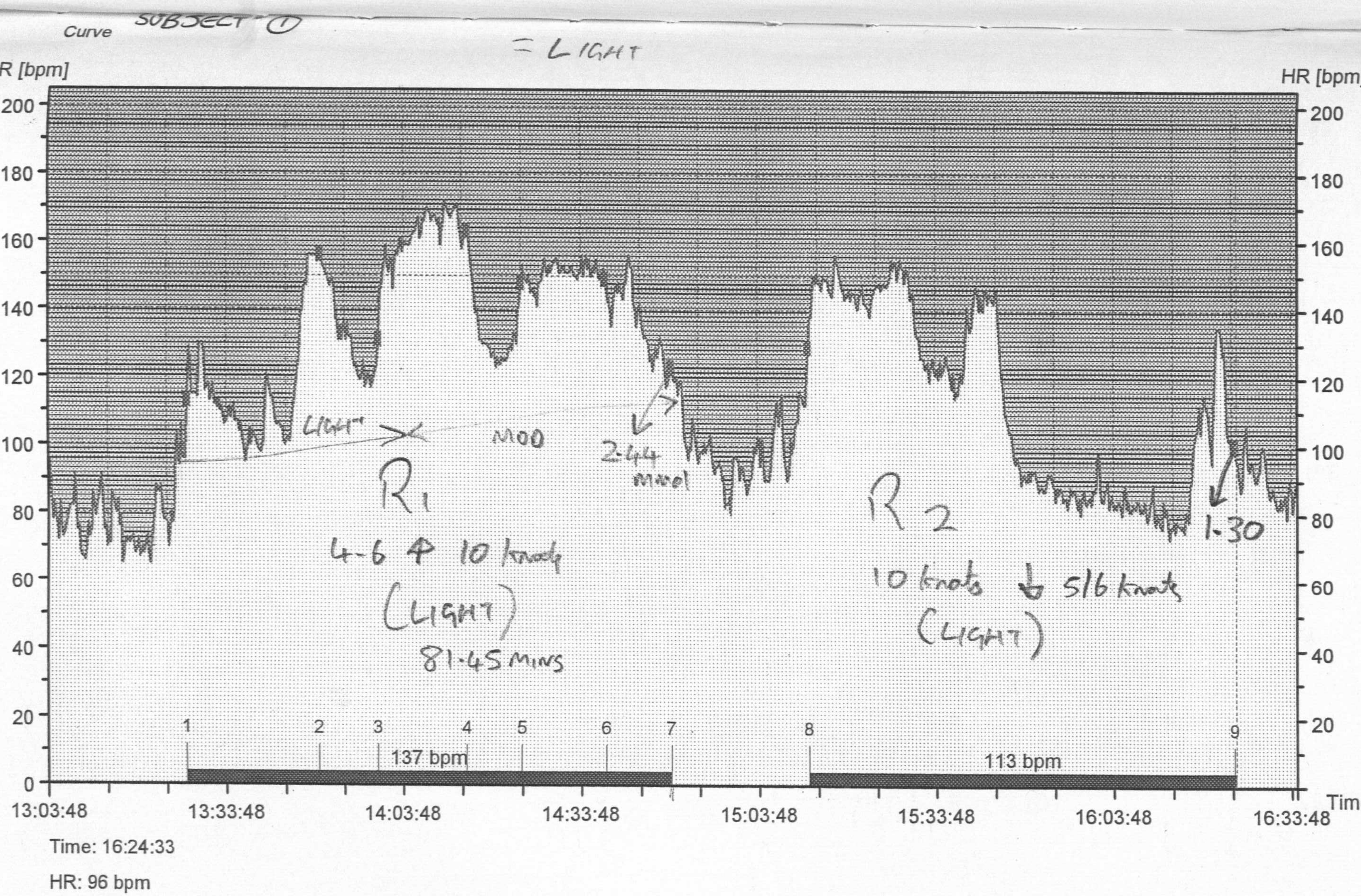
	This test	[redacted]2
Time to fatigue:	38.4 seconds	29.3 seconds
Mean force:	427.0 Newtons	439.4 Newtons

Body fat results:			
	Bicep	7.2 mm	
	Tricep	13.0 mm	
	Sub-Scapular	14.0 mm	
	Supra-Iliac	12.2 mm	
	Total	46.4 mm	Body fat: 25.8 % (27.8 % Dec 01)

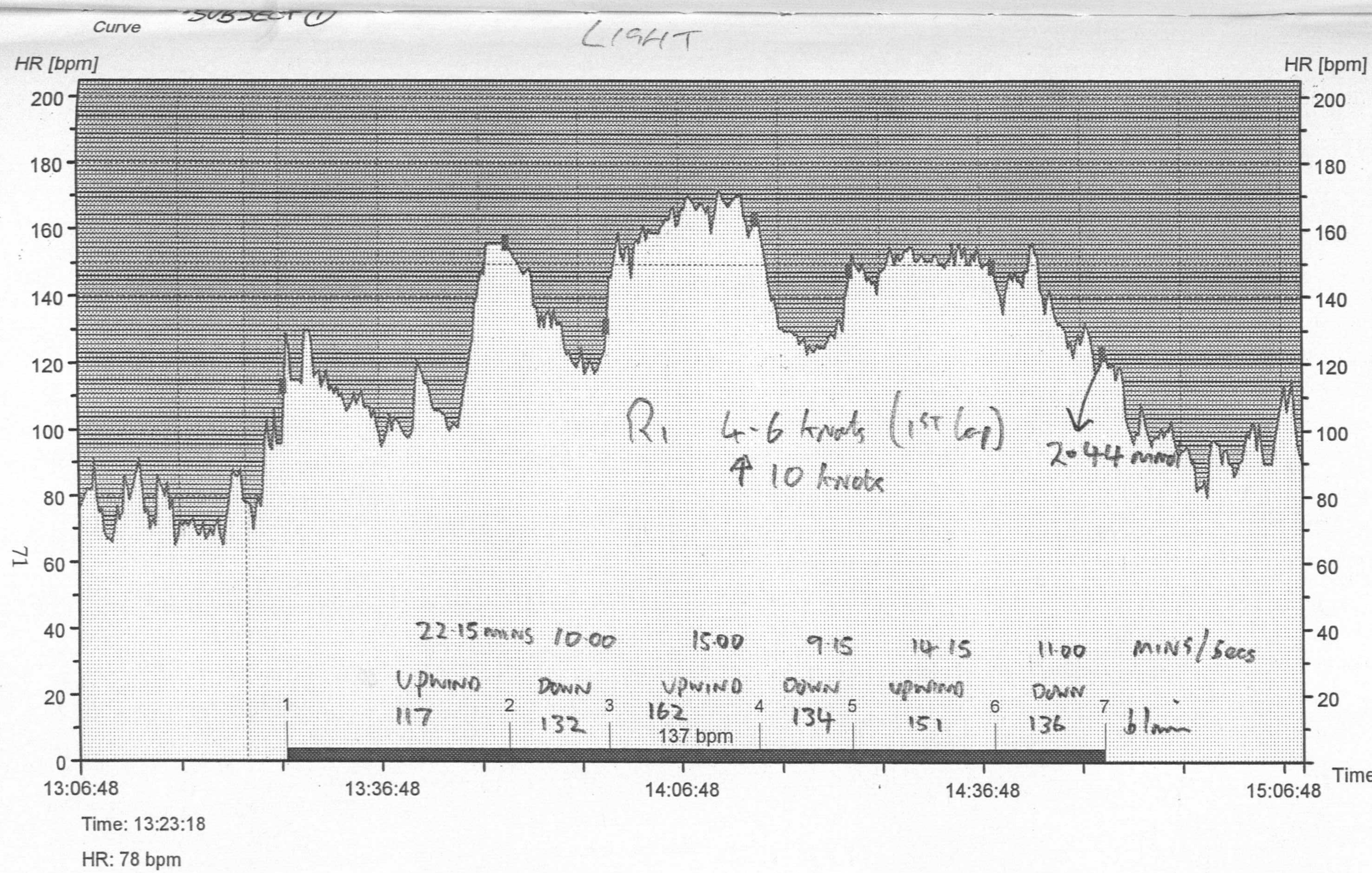
APPENDIX C

(relevant to chapter 4)

Light wind data for Laser sailing.

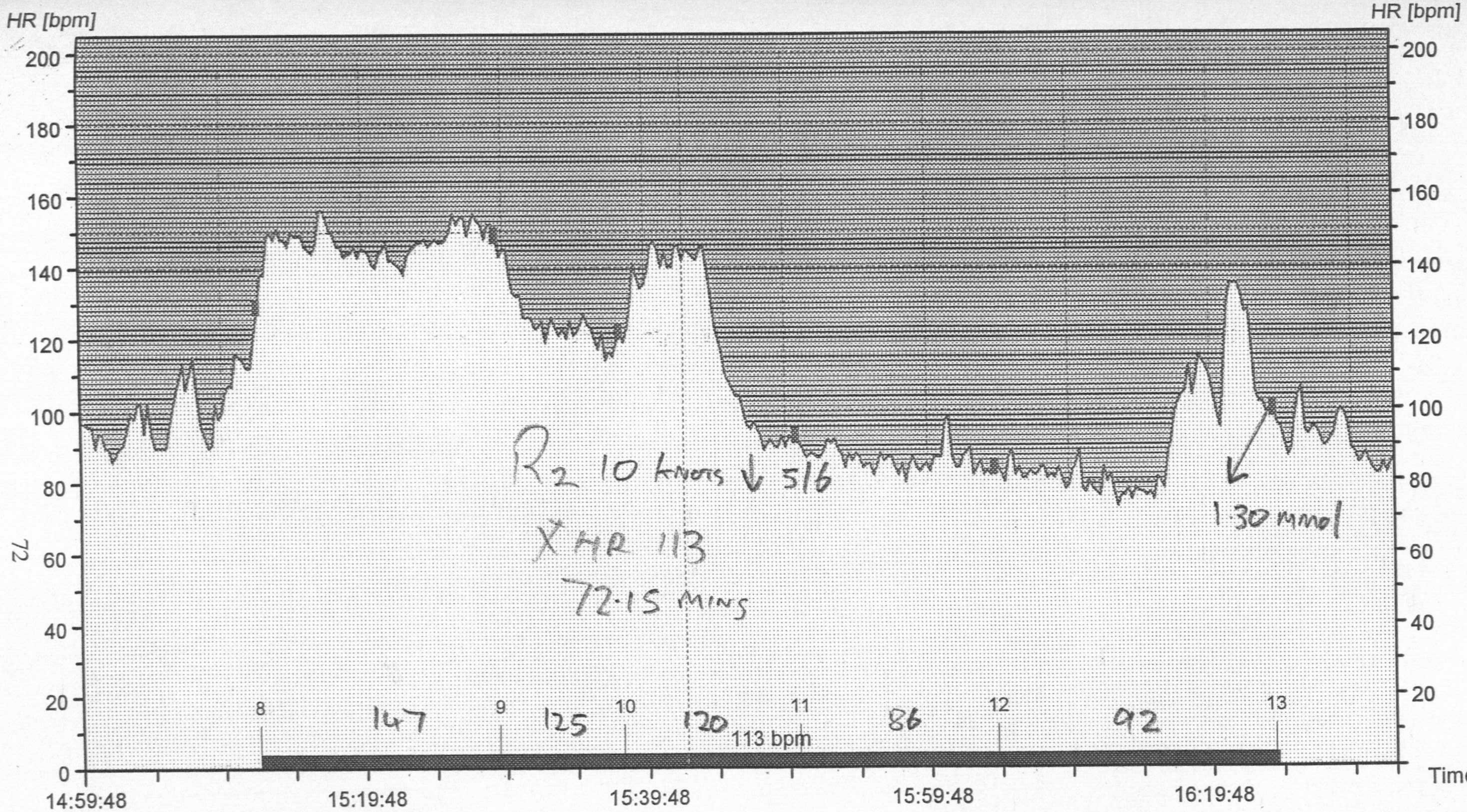


Person	SUB ①	Date	15/06/1994	Heart rate avera	126 bpm	Limits 1	150 - 200
Exercise		Time	11:17:48	Heart rate max	172 bpm	Limits 2	150 - 200
Sport		Duration	5:41:45.0				
Note	Hayling Europeans 15/6/94 4-6 knots increase 10 knots			Selection	13:27:18 - 16:24:33 (2:34:00.0)		



Person	SUB 1	Date	15/06/1994	Heart rate avera	137 bpm	Limits 1	150 - 200
Exercise		Time	11:17:48	Heart rate max	172 bpm	Limits 2	150 - 200
Sport		Duration	5:41:45.0				
Note	vis. Havling Europeans. 15/6/94. 4-6 knots. increase 10 knots			Selection	13:27:18 - 14:49:03 (1:21:45.0)		

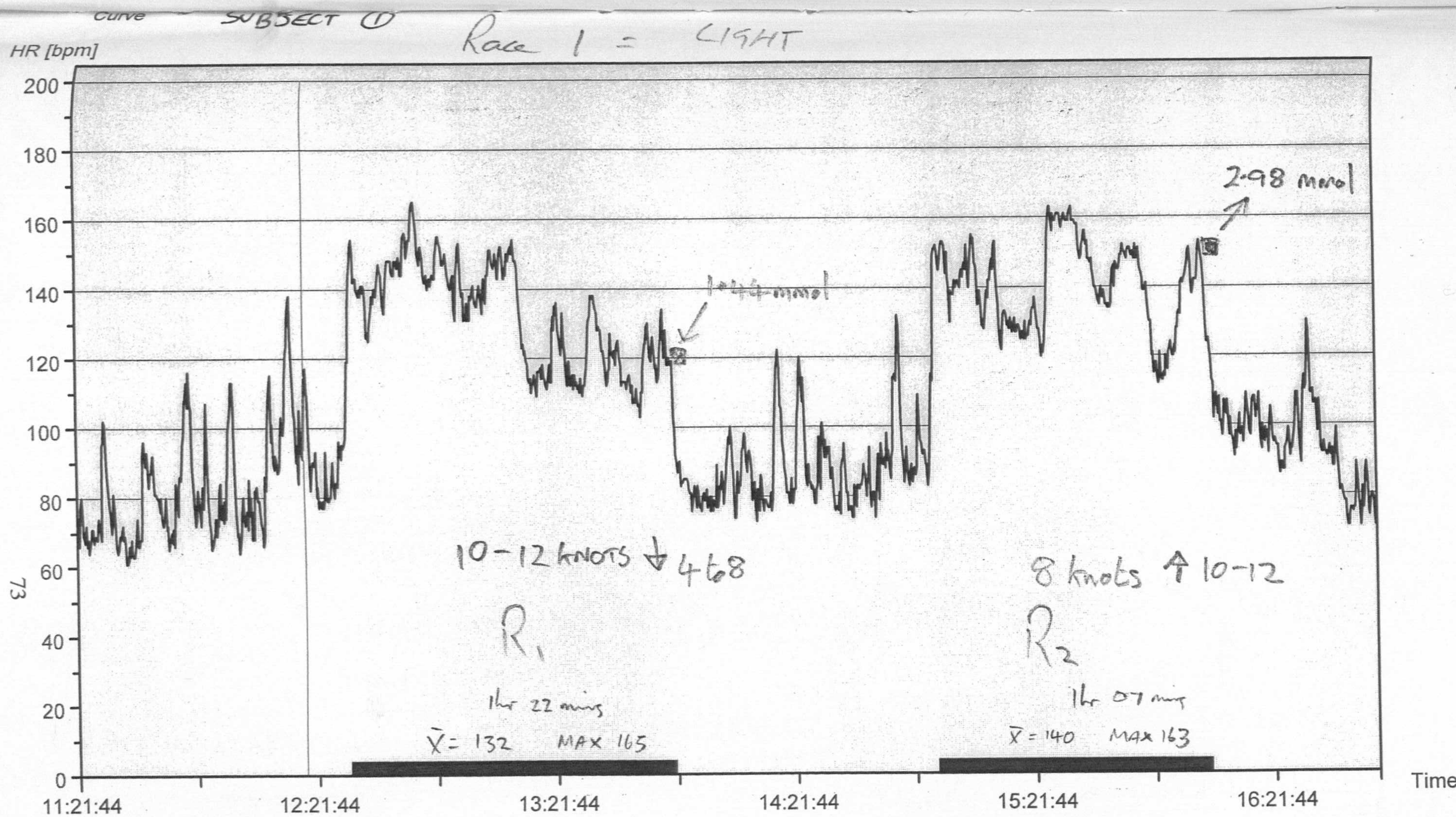
Curve SUBJECT 1 = LIGHT



Time: 15:42:33

HR: 142 bpm

Person	SVB 1	Date	15/06/1994	Heart rate avera	113 bpm	Limits 1	150 - 200
Exercise		Time	11:17:48	Heart rate max	156 bpm	Limits 2	150 - 200
Sport	g	Duration	5:41:45.0				
Note	Hayling Europeans 15/6/94 10 knots de5-6 10 knots upw	Selection	15:12:18 - 16:24:33 (1:12:15.0)				

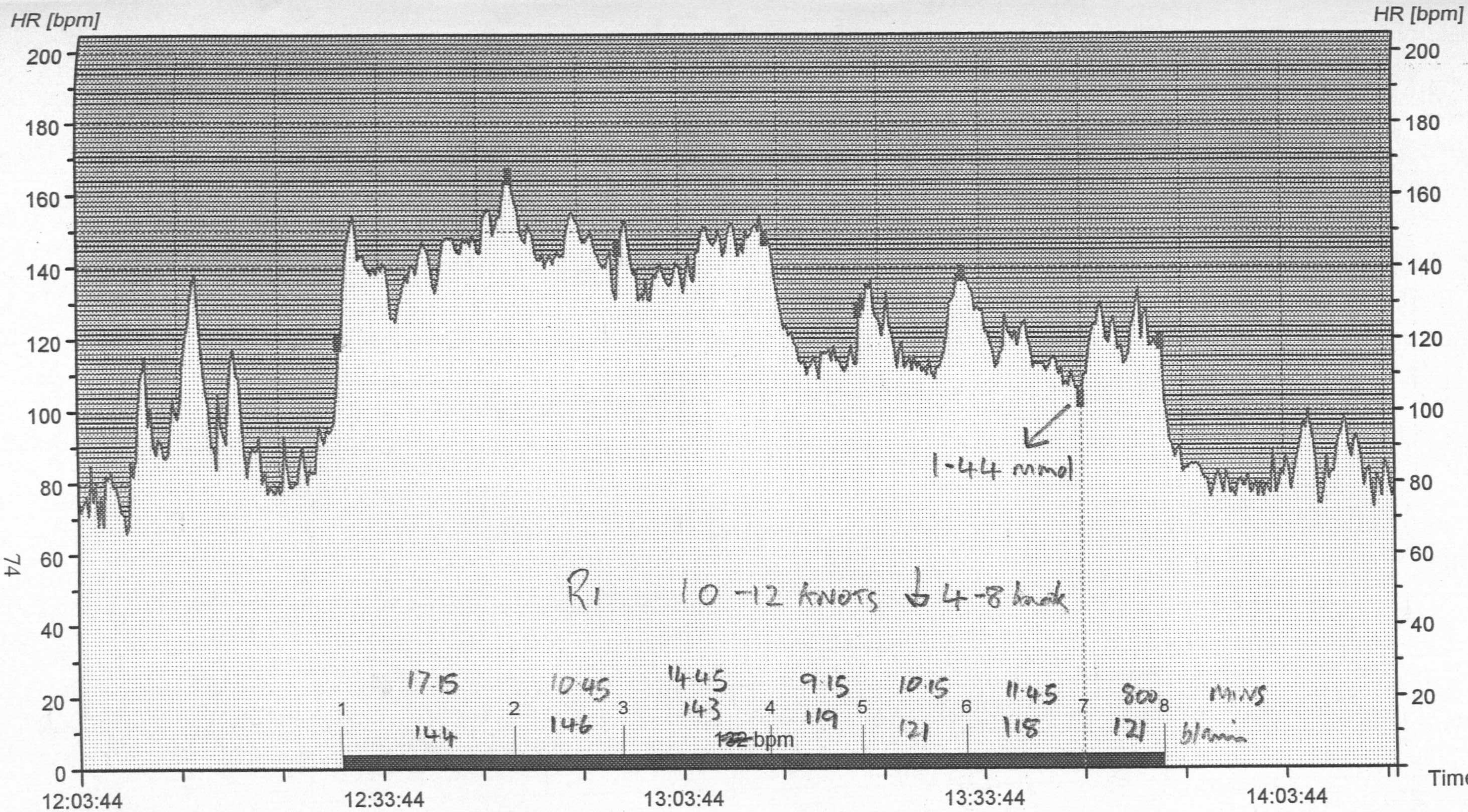


Time: 12:18:44

HR: 105 bpm

Person	SUB ①	Date	16/06/1994	Heart rate	136 / 165	Limits 1	150 - 200
Exercise		Time	09:25:44	Max. HR	0	Limits 2	150 - 200
Sport		Duration	7:37:15.0	Distance		Thresholds	150 - 200
Note	Laser Europeans 16.6.94. upwind finish			Selection	03:04:15 - 06:40:15 (2:30:15.0)		

Curve SUBJECT 1



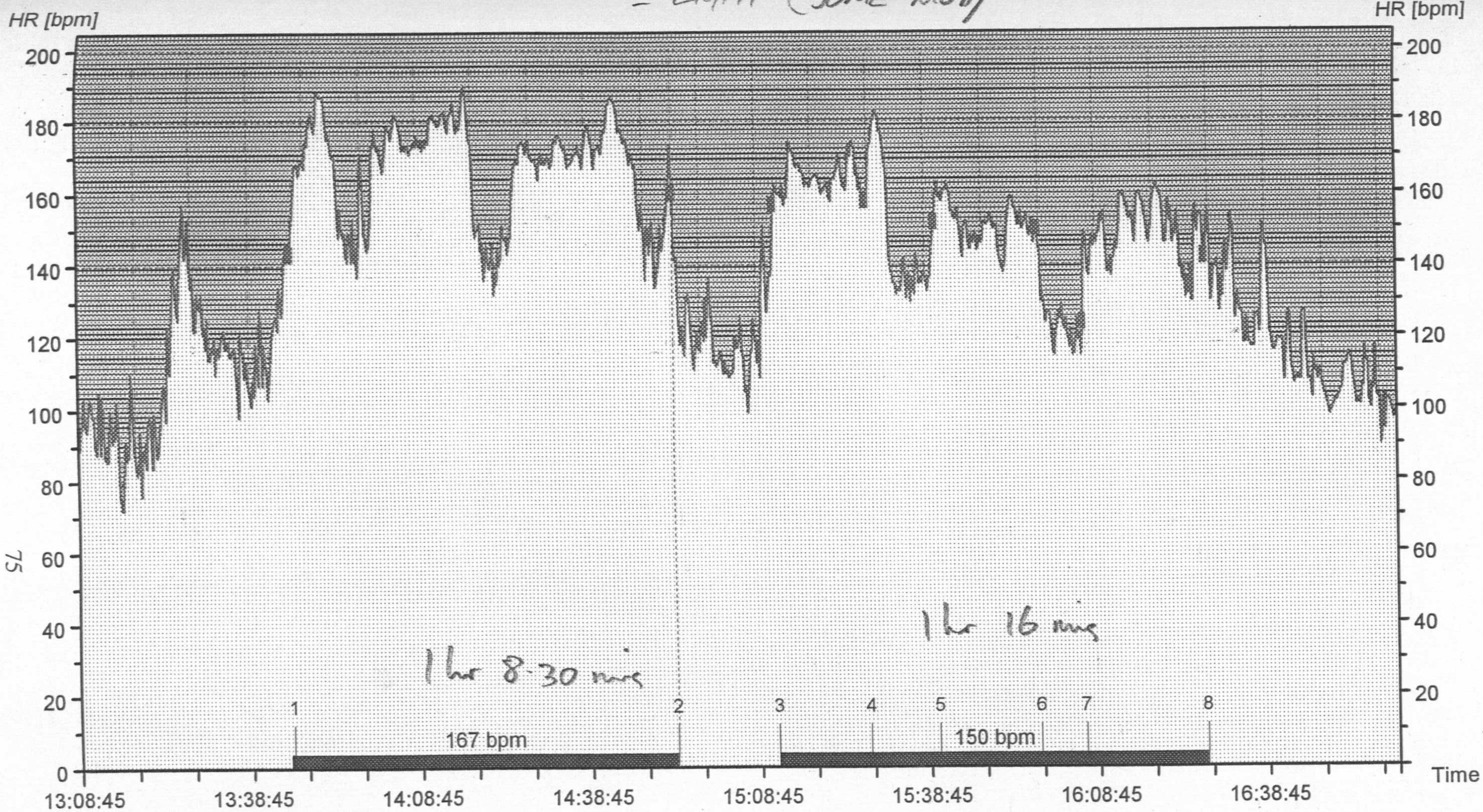
Time: 13:43:44

HR: 103 bpm

Person	SUB 1	Date	16/06/1994	Heart rate avera	132 bpm	Limits 1	150 - 200
Exercise	AD-16-6	Time	09:25:44	Heart rate max	165 bpm	Limits 2	150 - 200
Sport	Running	Duration	7:37:15.0				
Note	Laser Eurolymp 16.6.94. Upwind finish . R 1 10-12 knots, R			Selection	12:29:44 - 13:51:44 (1:22:00.0)		

Curve SUBJECT 2

= LIGHT (SOME MOD)

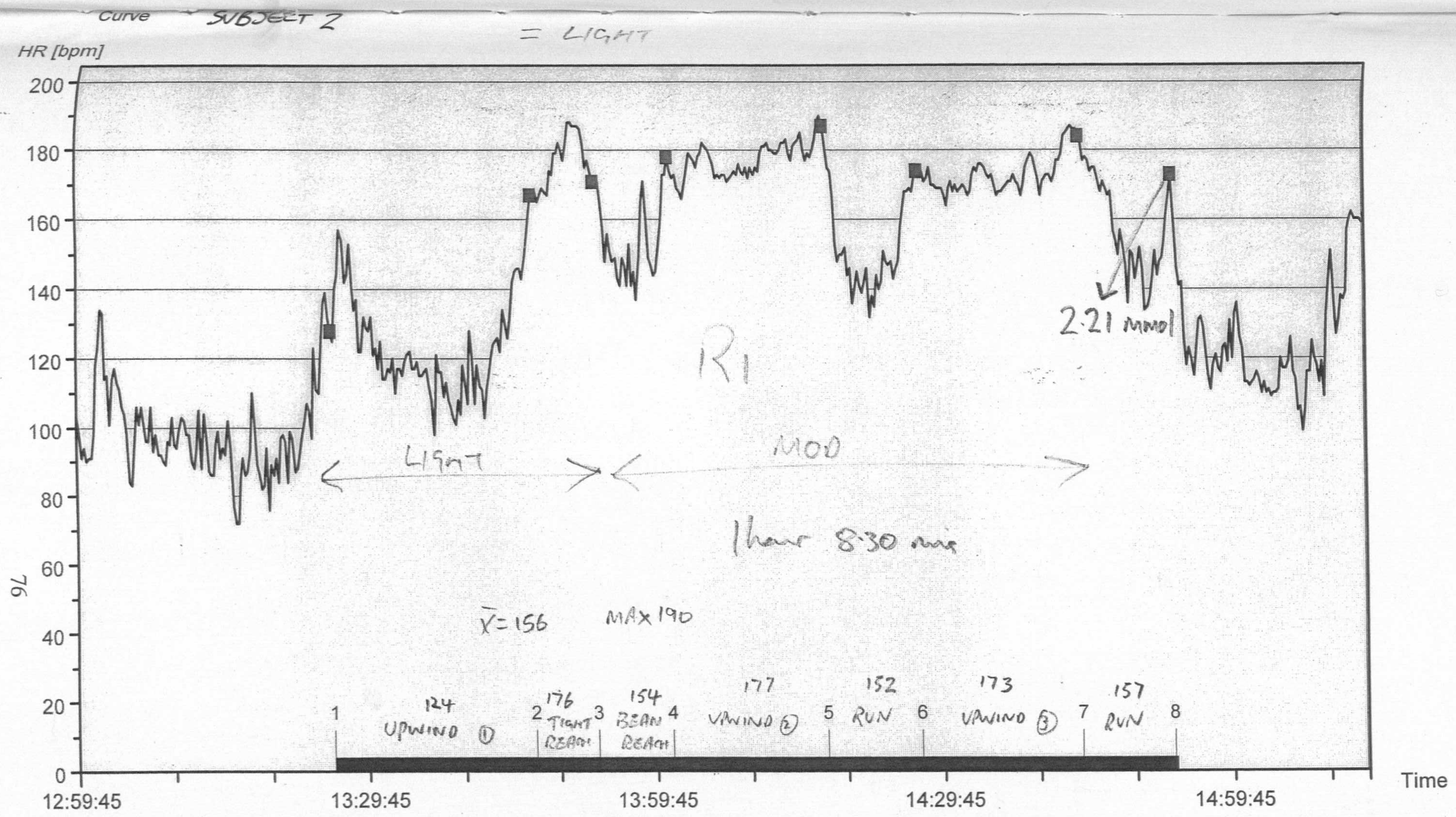


Time: 14:54:00

HR: 160 bpm

Person	SUB 2	Date	15/06/1994	Heart rate avera	158 bpm		
Exercise		Time	11:11:45	Heart rate max	190 bpm		
Sport		Duration	6:24:15.0				
Note	Hayling Europeans 15/6/94.10 knots decrease 5/6 knots			Selection	13:45:45 - 16:28:00 (2:24:15.0)		

Curve

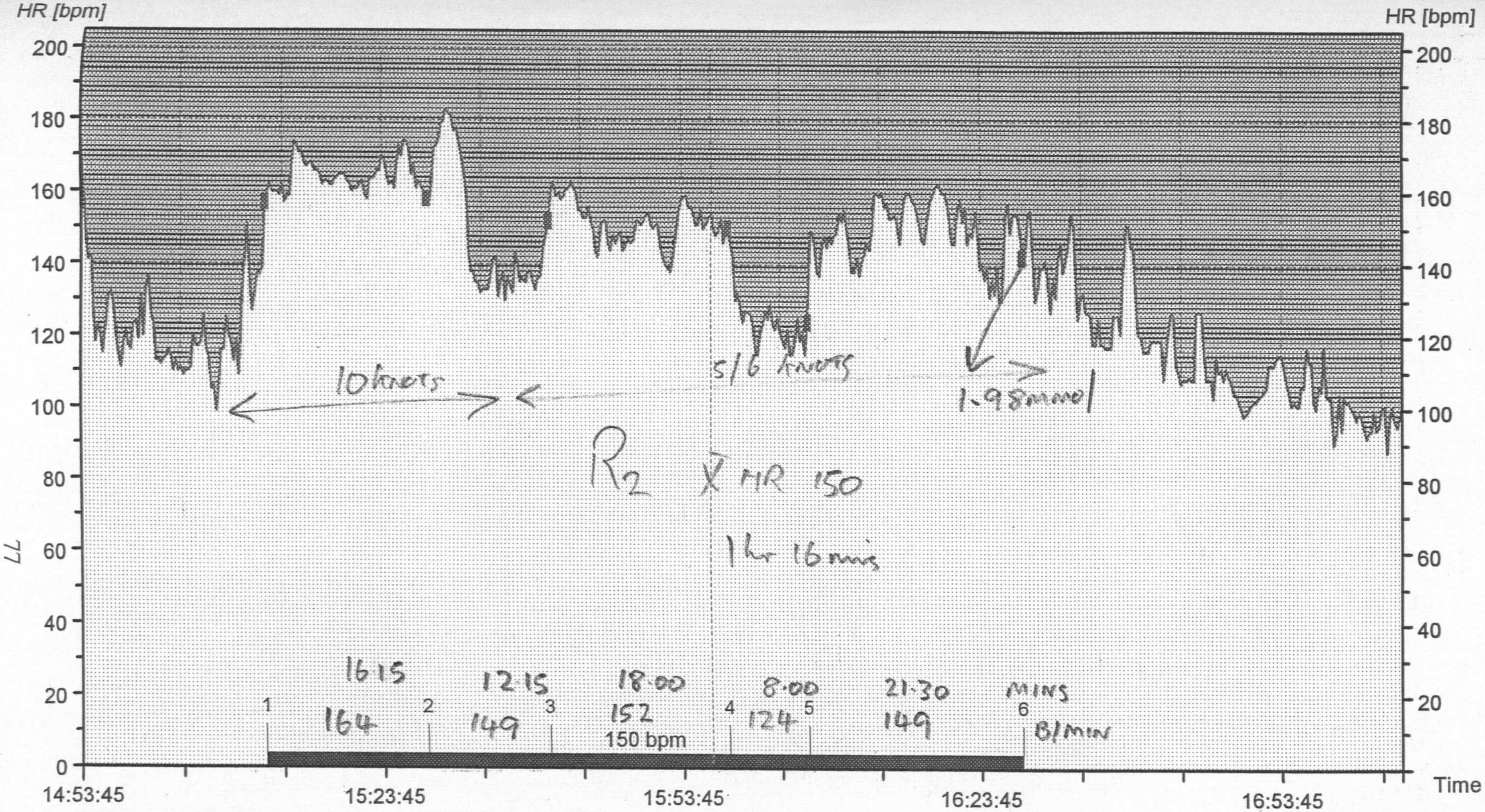


Time: 15:13:30

HR: 159 bpm

Person	SUB 2	Date	15/06/1994	Heart rate	156 / 190	Limits 1	150 - 200
Exercise		Time	11:11:45	Max. HR	0	Limits 2	150 - 200
Sport		Duration	6:24:15.0	Distance		Thresholds	150 - 200
Note	Hayling euros. 15.6.94. 4-6 knots R1, 10-12 knots			Selection	02:14:30 - 03:42:15 (1:27:45.0)		

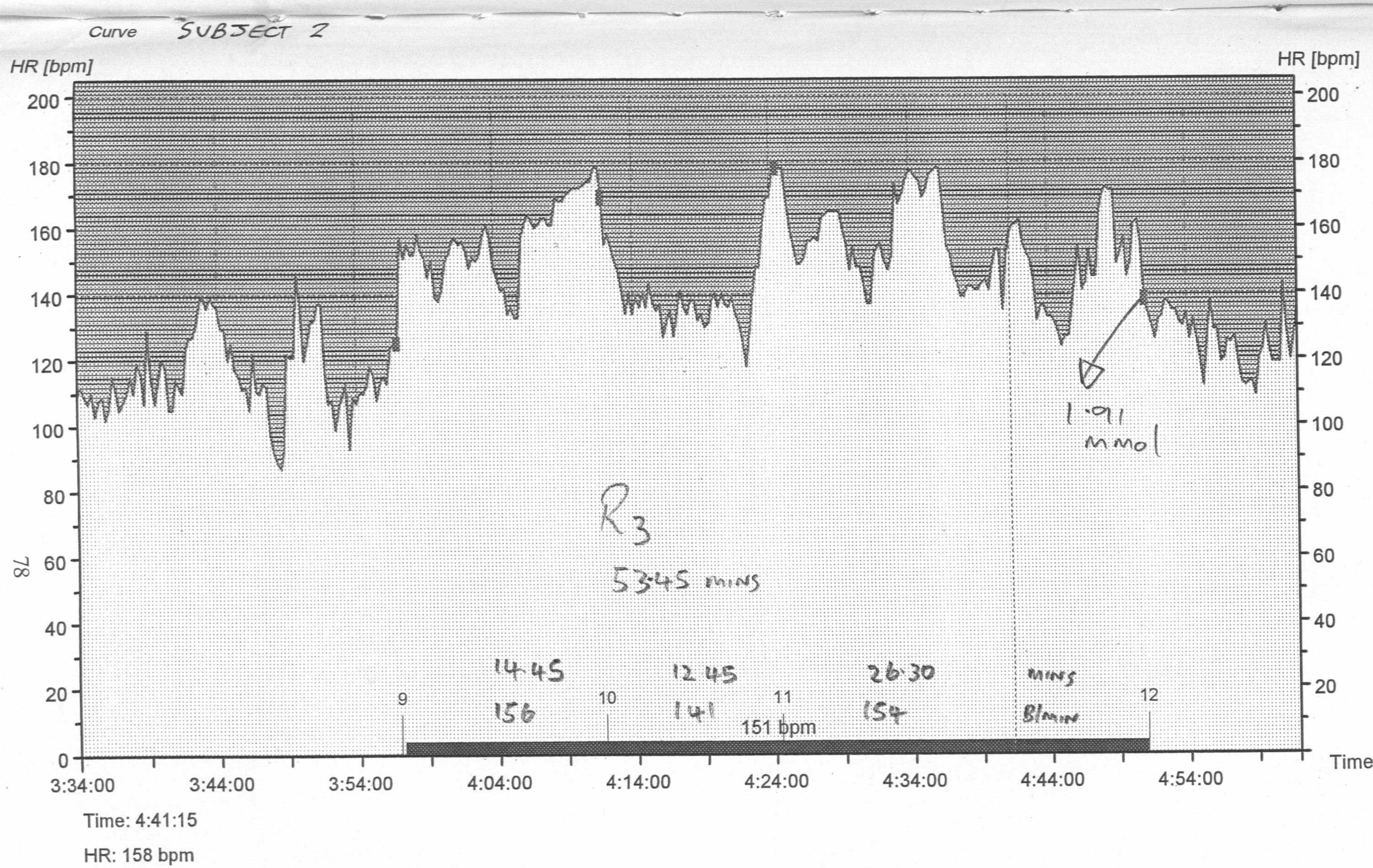
Curve SUBJECT 2



Time: 15:56:45

HR: 154 bpm

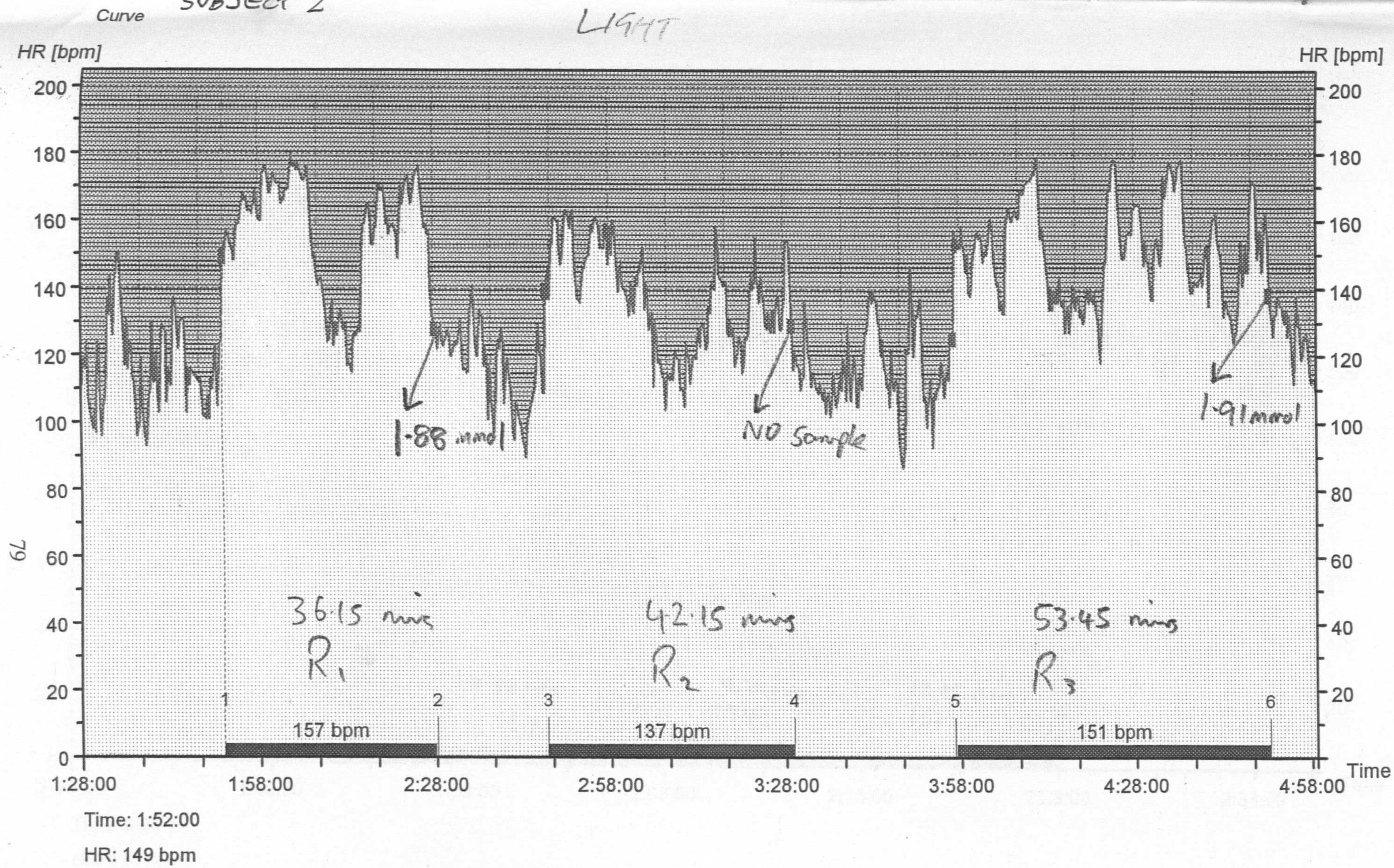
Person	SUB 2	Date	15/06/1994	Heart rate avera	150 bpm		
Exercise		Time	11:11:45	Heart rate max	183 bpm		
Sport		Duration	6:24:15.0				
Note	Hayling Europeans 15/6/94 10 knots decrease 5/6 knots			Selection	15:12:00 - 16:28:00 (1:16:00.0)		



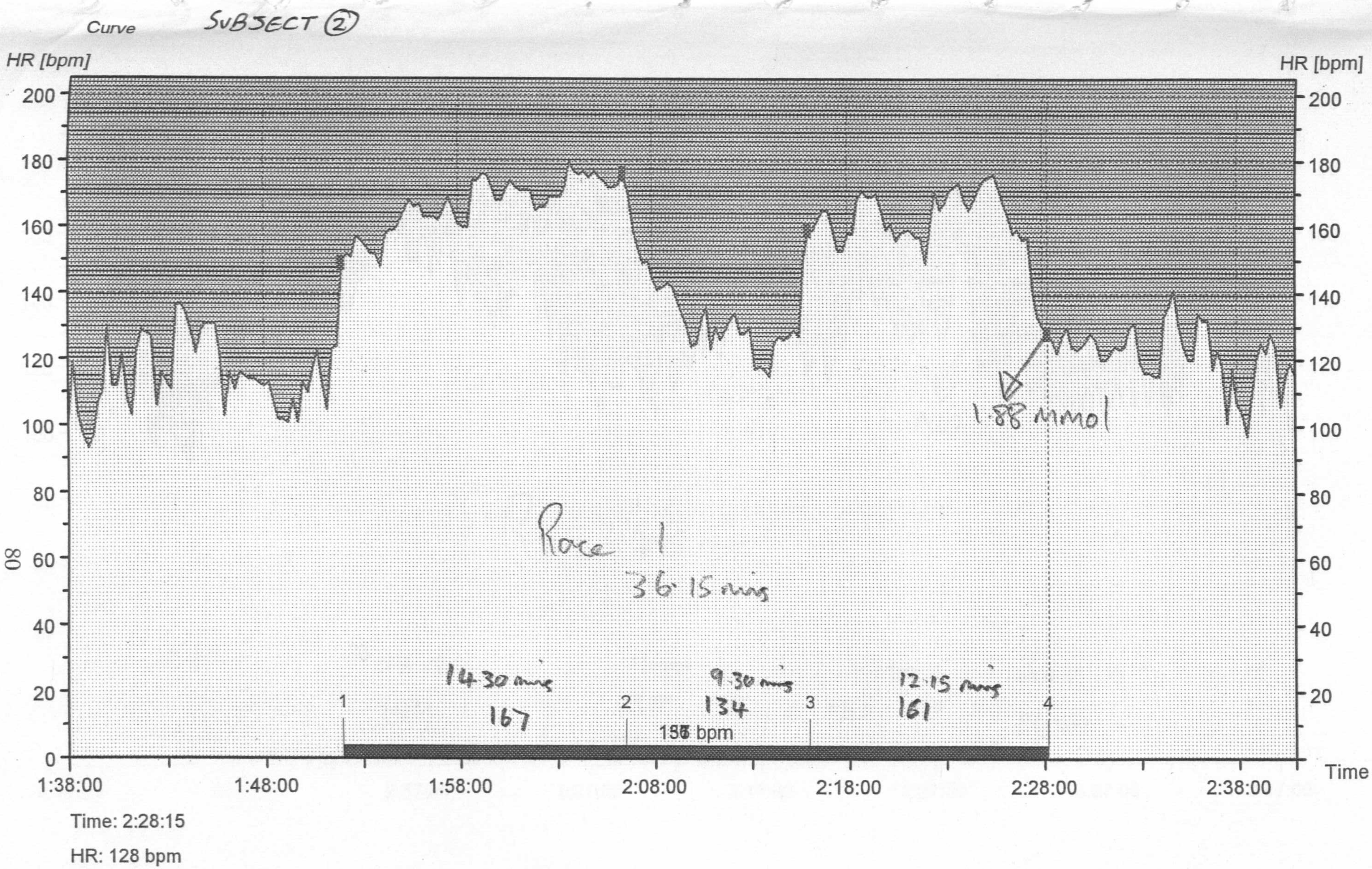
Person	SUB ②	Date	21/02/1994	Heart rate avera	151 bpm		
Exercise		Time	09:18:46	Heart rate max	179 bpm		
Sport		Duration	5:23:45.0				
Note	hayling national qualifier, 5-8 knots			Selection	3:57:15 - 4:51:00 (0:53:45.0)		

SUBJECT 2

LIGHT

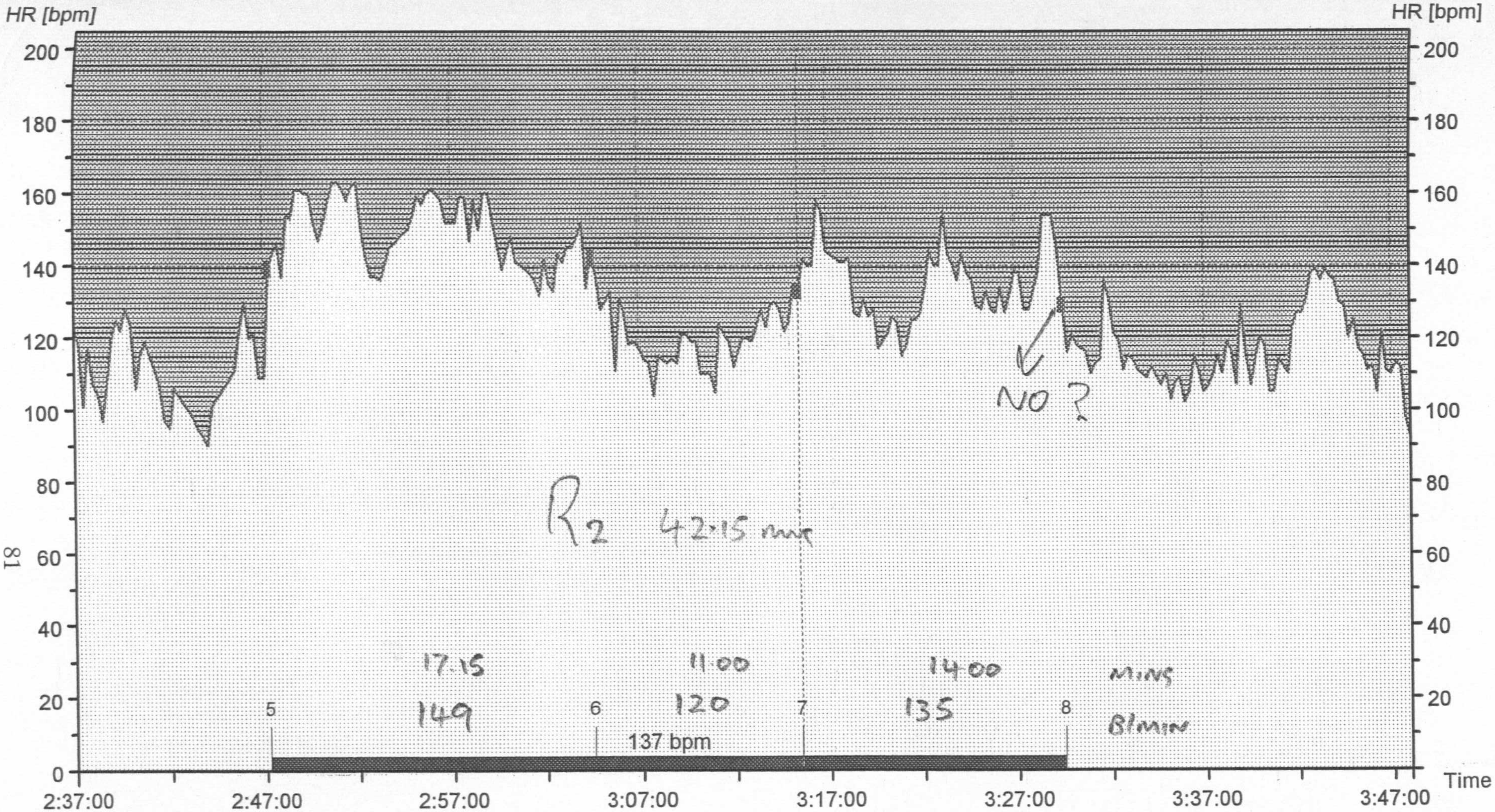


Person	SUB 2	Date	21/02/1994	Heart rate avera	148 bpm		
Exercise		Time	09:18:46	Heart rate max	180 bpm		
Sport		Duration	5:23:45.0				
Note	hayling national qualifier 5-8 knots			Selection	1:52:00 - 4:51:00 (2:12:00.0)		



Person	SVB 2	Date	21/02/1994	Heart rate avera	148 bpm		
Exercise		Time	09:18:46	Heart rate max	180 bpm		
Sport		Duration	5:23:45.0				
Note	hayling national qualifier 5-8 knots			Selection	1:52:00 - 4:51:00 (2:12:15.0)		

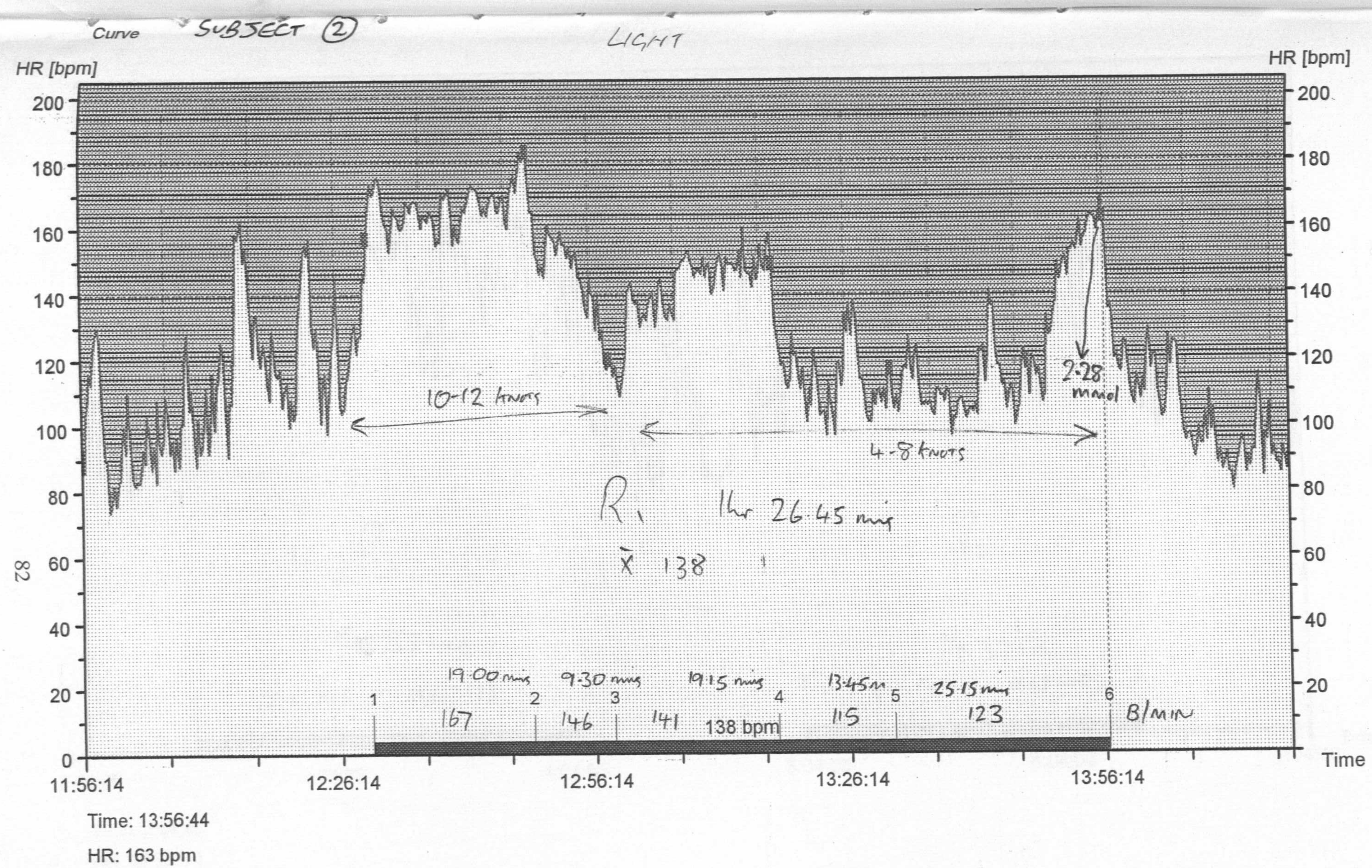
Curve SUBJECT (2)



Time: 3:15:30

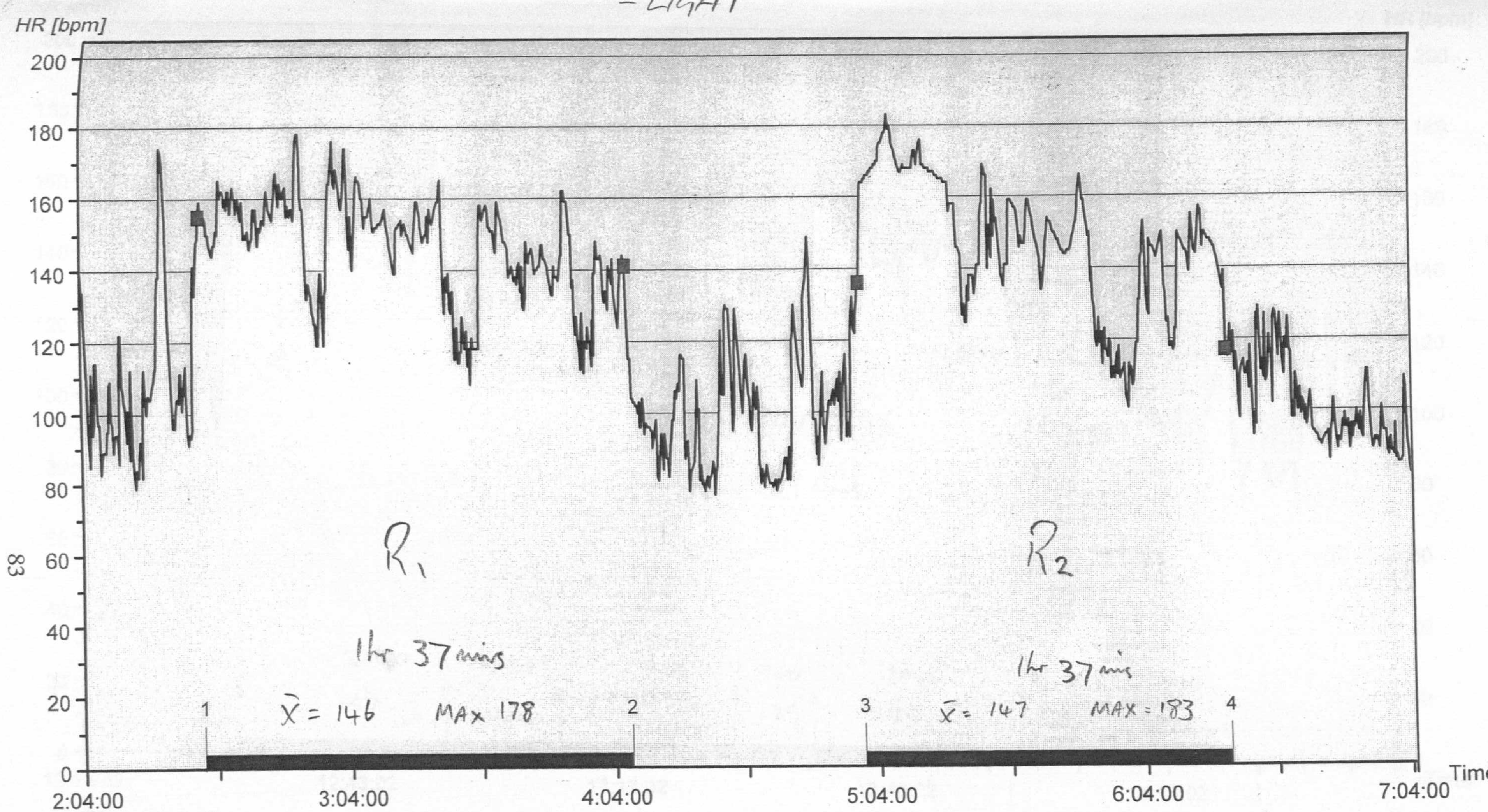
HR: 133 bpm

Person	SUB (2)	Date	21/02/1994	Heart rate avera	137 bpm		
Exercise		Time	09:18:46	Heart rate max	163 bpm		
Sport		Duration	5:23:45.0				
Note	havling national qualifier. 5-8 knots			Selection	2:47:15 - 3:29:30 (0:42:15.0)		



Person	SUB 2	Date	16/06/1994	Heart rate avera	138 bpm		
Exercise		Time	09:22:14	Heart rate max	183 bpm		
Sport		Duration	7:42:30.0				
Note	Hayling Europeans, 16/6/94. 10-12 knots decrease 4-8			Selection	12:29:59 - 13:56:44 (1:26:45.0)		

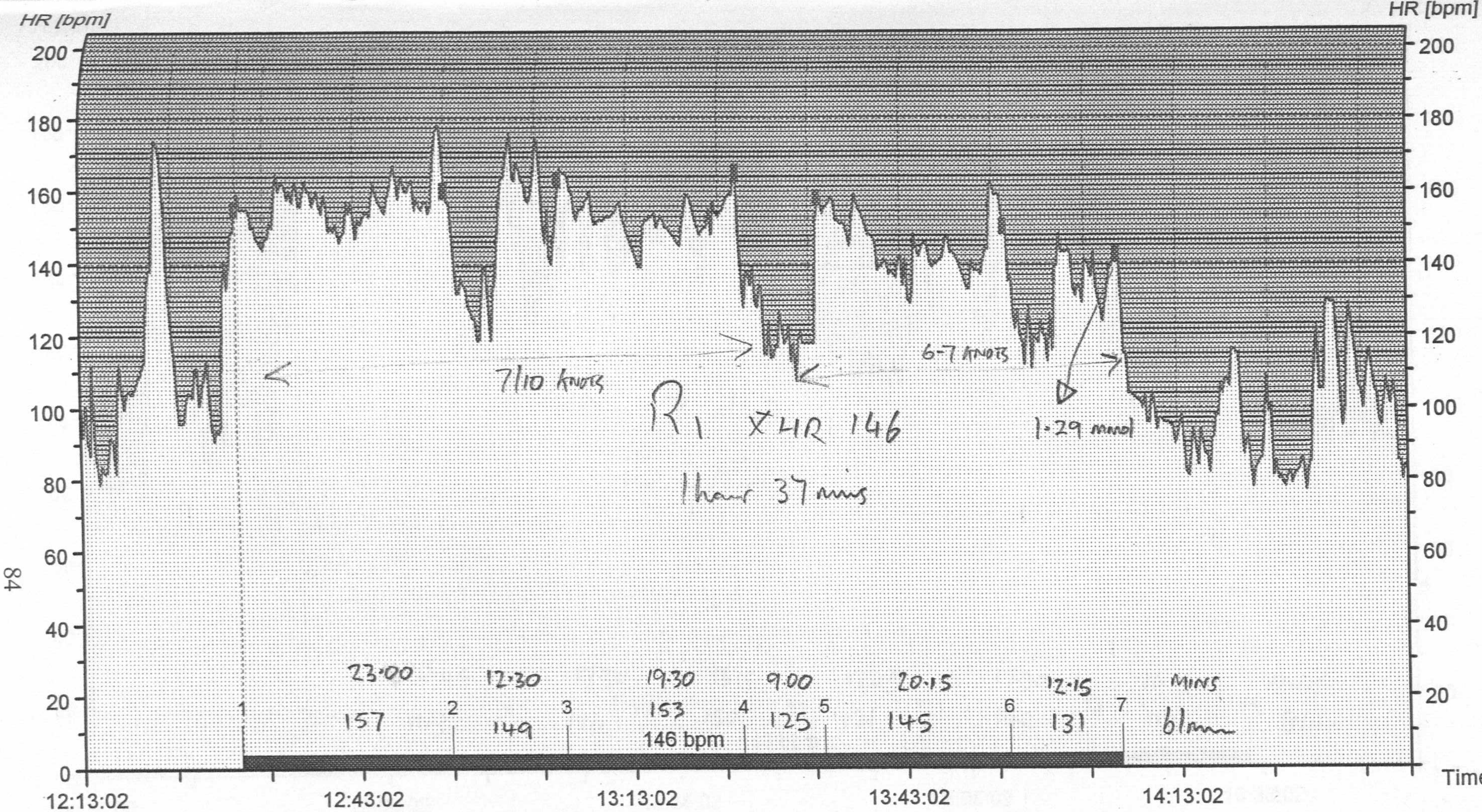
Curve SUBJECT ② = LIGHT



Time: 7:04:45

HR: 82 bpm

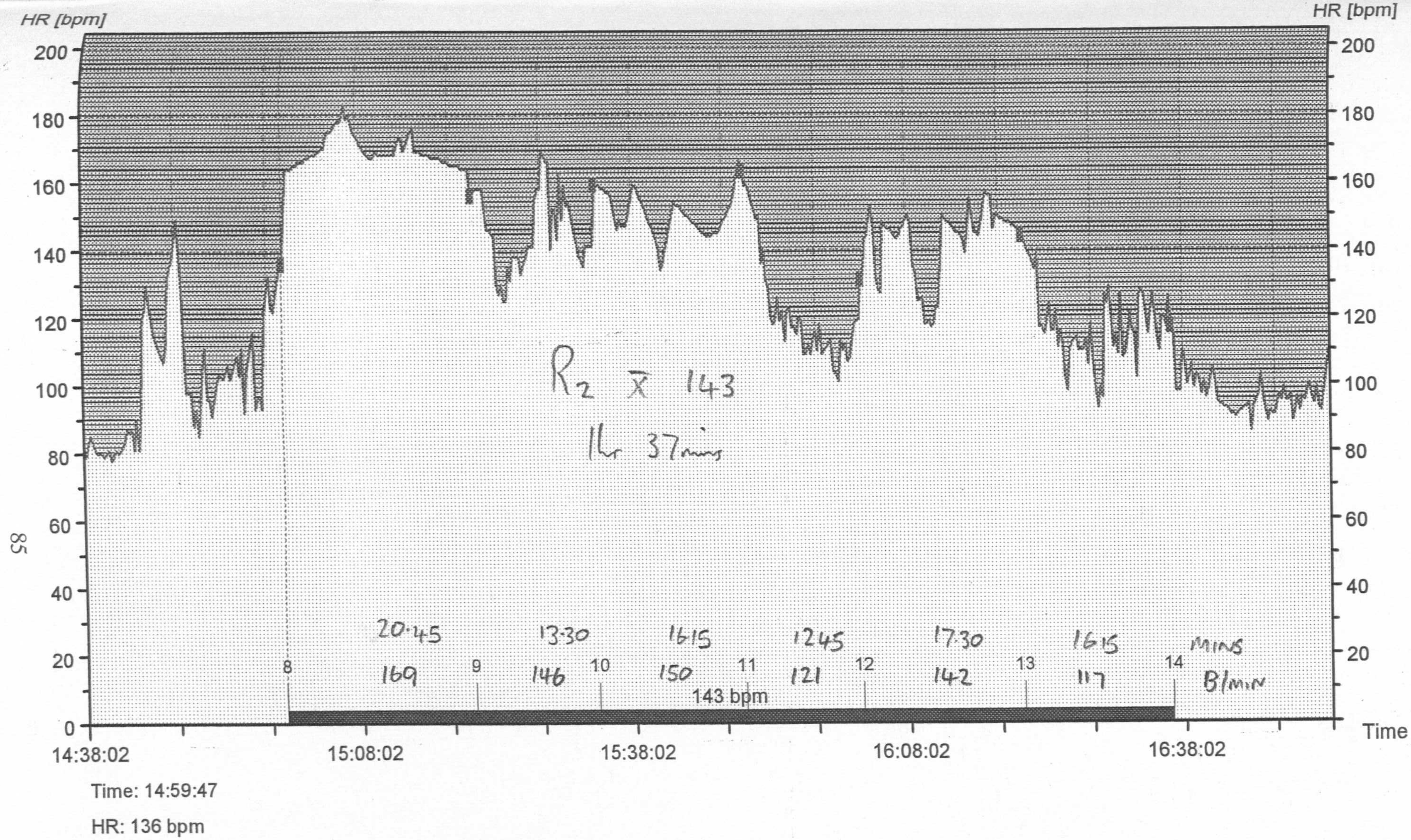
Person	SUB ②	Date	17/06/1994	Heart rate	147 / 183	Limits 1	150 - 200
Exercise		Time	09:59:02	Max. HR	0	Limits 2	150 - 200
Sport		Duration	7:23:00.0	Distance		Thresholds	150 - 200
Note	Hayling Eurolymps. 17/6/94. 7-10 knots R1, 6-10 I			Selection	2:31:00 - 6:23:30 (2:59:30.0)		



Time: 12:30:02

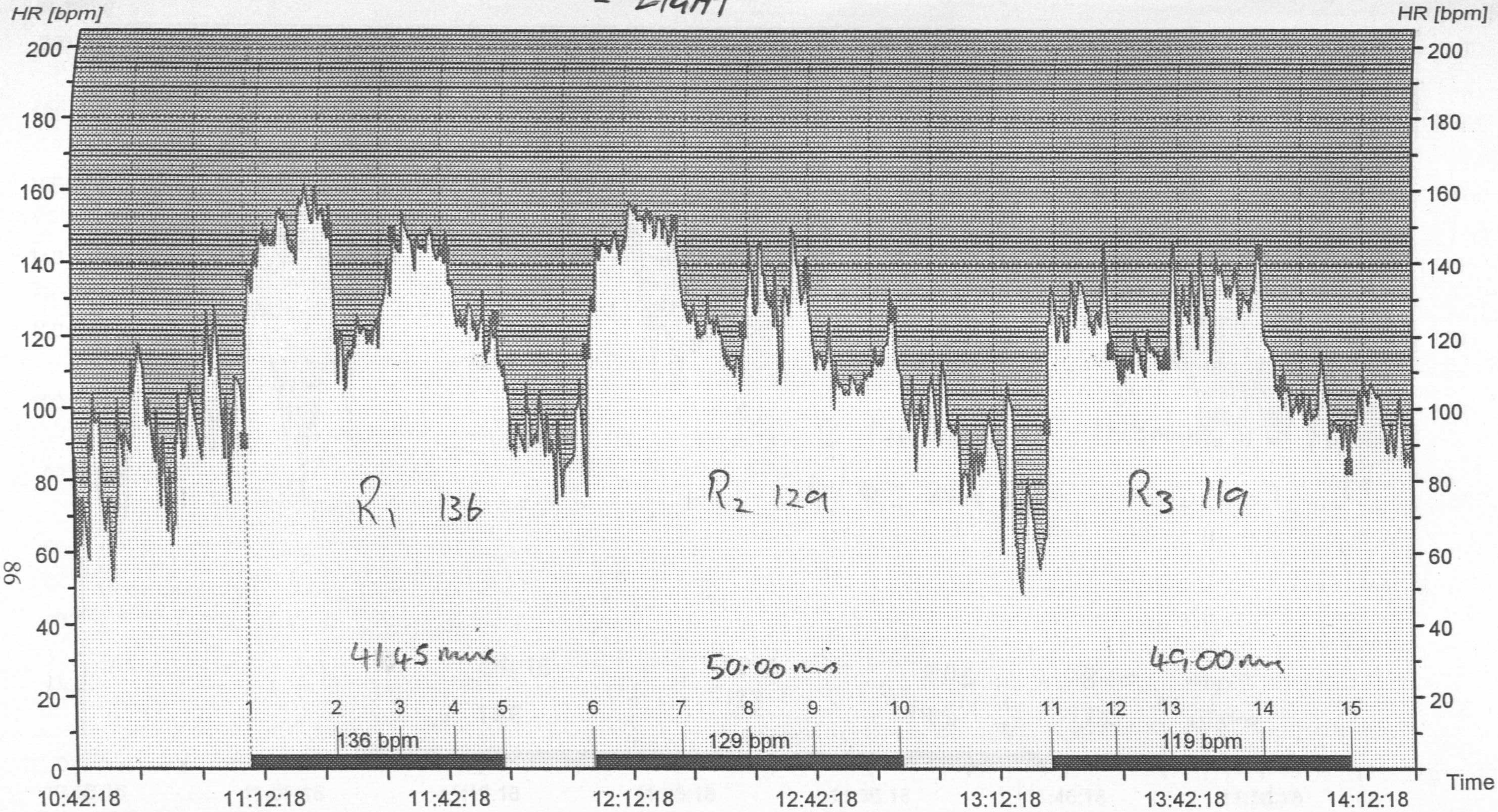
HR: 155 bpm

Person	SUB 2	Date	17/06/1994	Heart rate avera	146 bpm		
Exercise		Time	09:59:02	Heart rate max	178 bpm		
Sport		Duration	7:23:00.0				
Note	d. Hayling Europeans, 17/6/94. 7-10 knots decreased 6/7			Selection	12:30:02 - 14:06:32 (1:36:30.0)		



Person	SUB 2	Date	17/06/1994	Heart rate avera	143 bpm		
Exercise		Time	09:59:02	Heart rate max	183 bpm		
Sport		Duration	7:23:00.0				
Note	Hayling Europeans, 17/6/94. 8-10 knots decreased 6 knots			Selection	14:59:47 - 16:36:47 (1:37:00.0)		

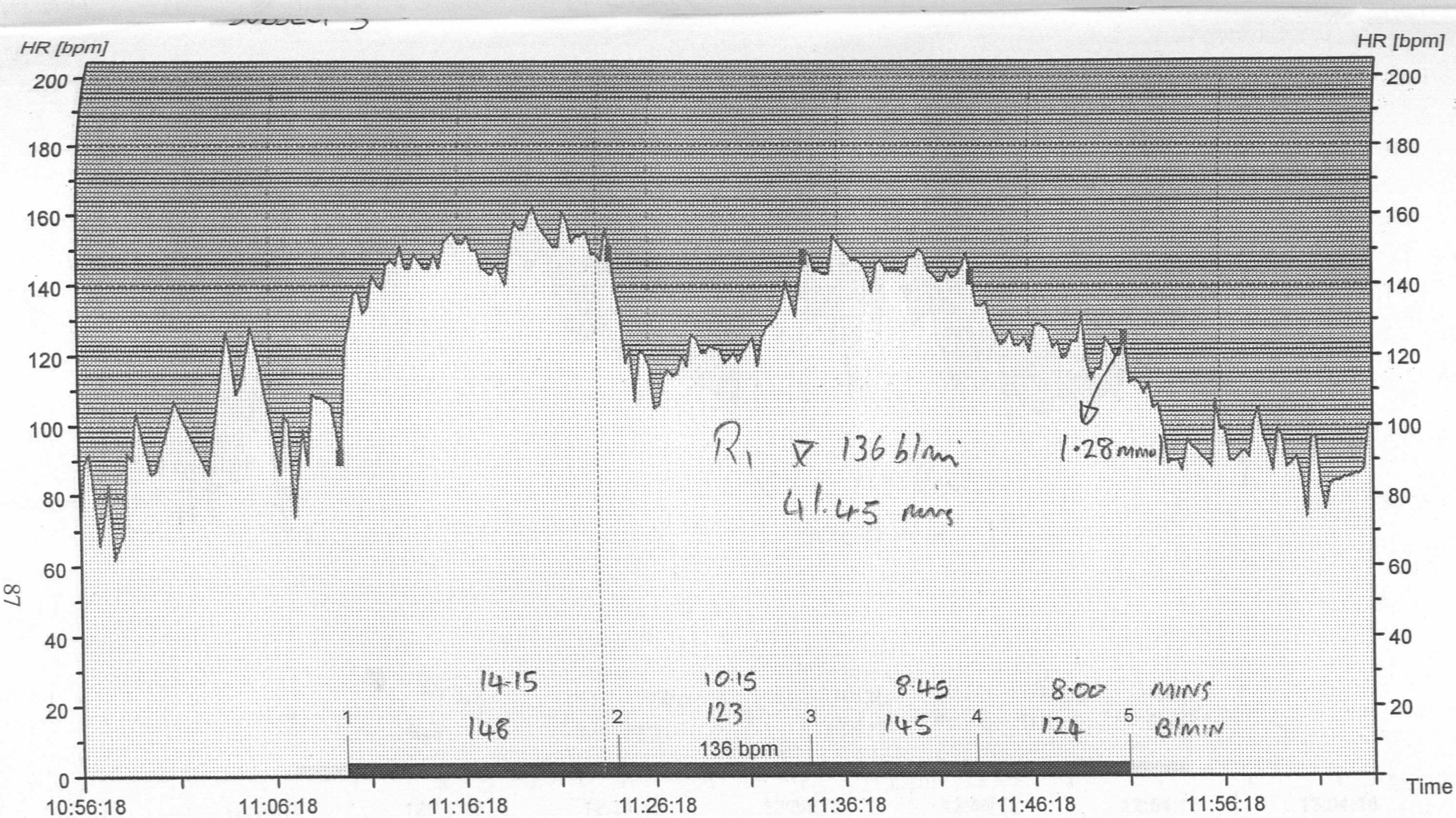
Curve - SUBJECT 3 = LIGHT



Time: 11:10:03

HR: 91 bpm

Person	SUB 3	Date	21/02/1994	Heart rate avera	128 bpm		
Exercise		Time	09:26:18	Heart rate max	162 bpm		
Sport		Duration	5:33:30.0				
Note	Hayling (cold) 21/2/94. 5-8 knots			Selection	11:10:03 - 14:09:48 (2:20:45.0)		

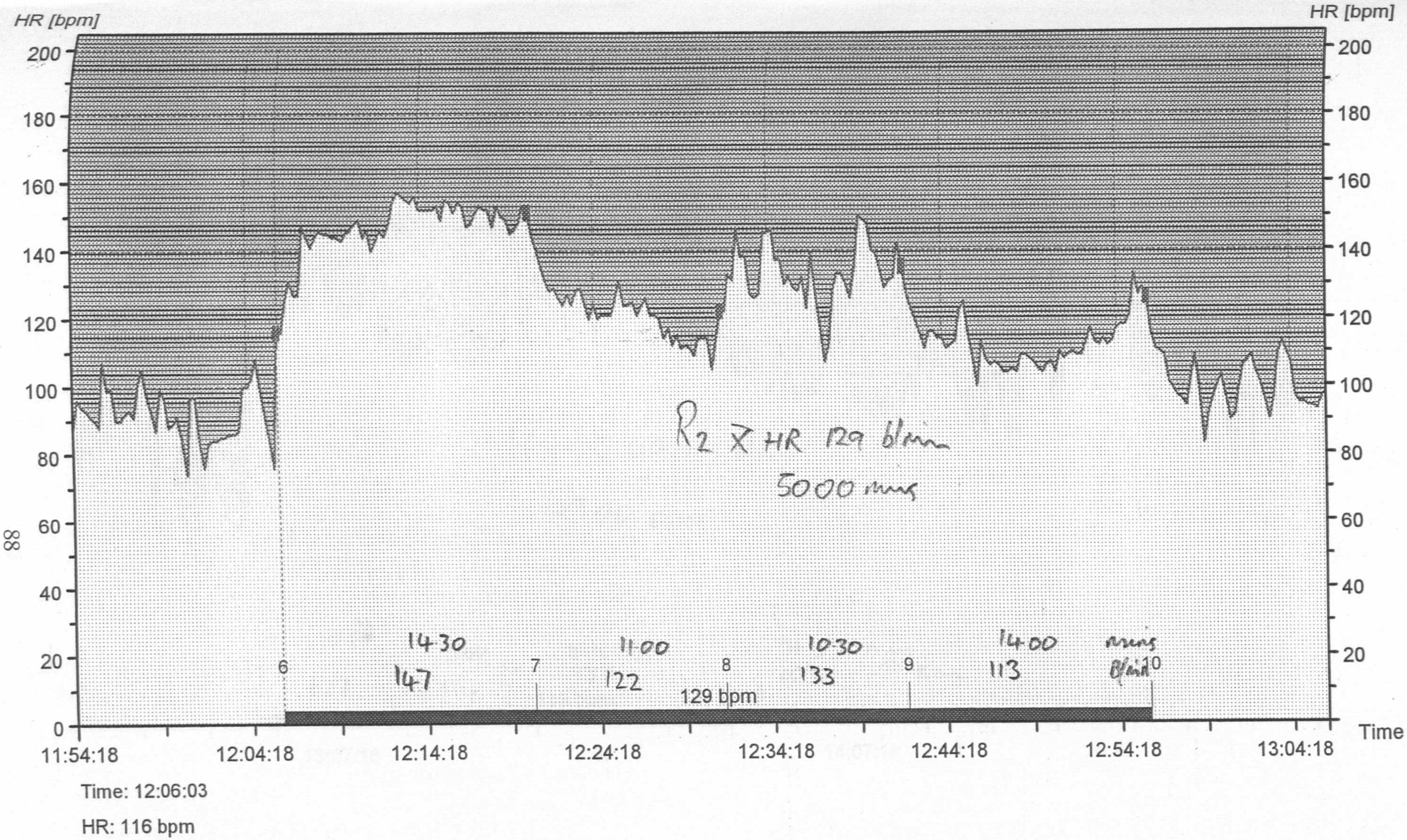


Time: 11:23:33

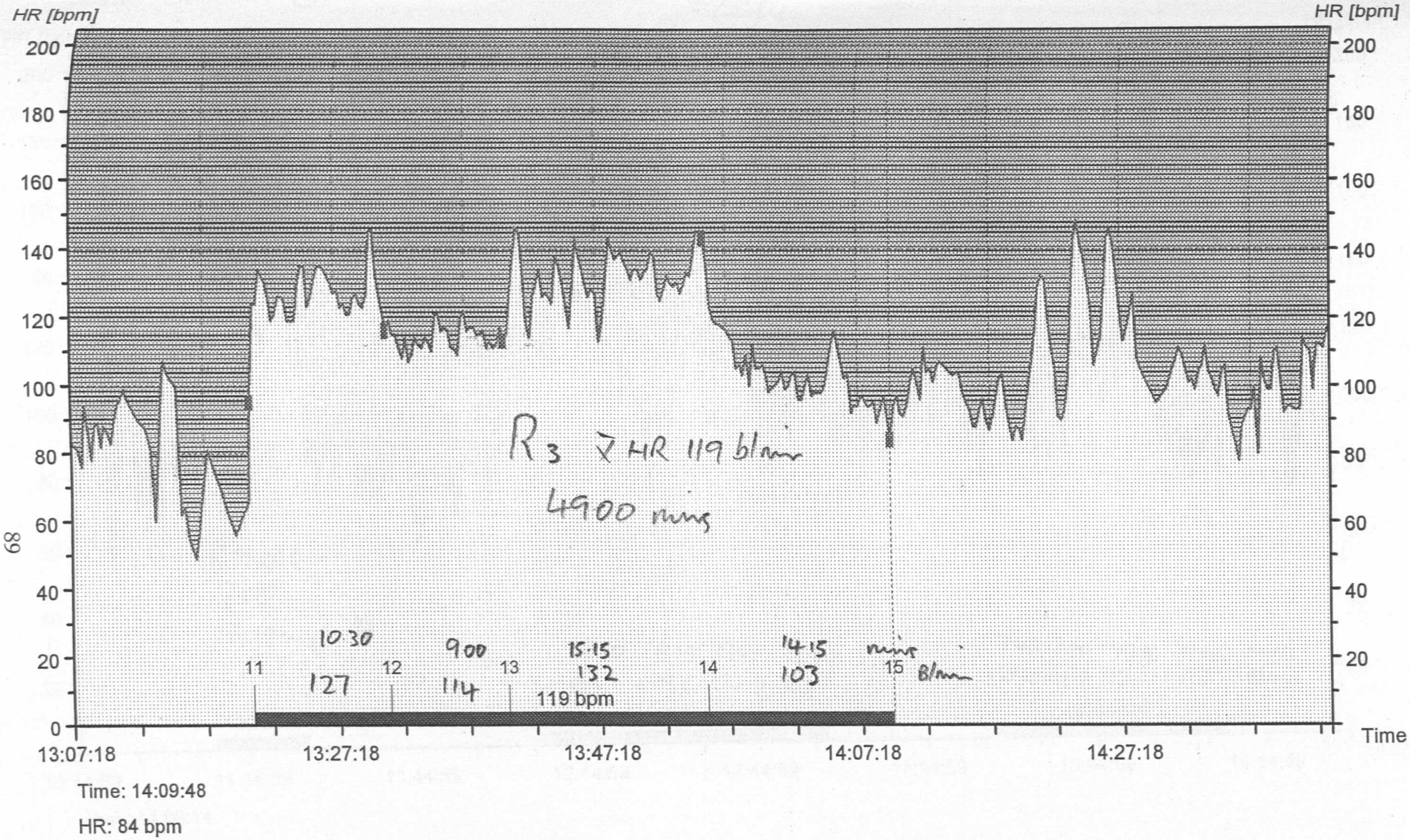
HR: 149 bpm

Person	SUB 3	Date	21/02/1994	Heart rate avera	136 bpm		
Exercise		Time	09:26:18	Heart rate max	162 bpm		
Sport		Duration	5:33:30.0				
Note	Hayling (cold) 21/2/94. 5-8 knots			Selection	11:10:03 - 11:51:18 (0:41:15.0)		

Subject 3

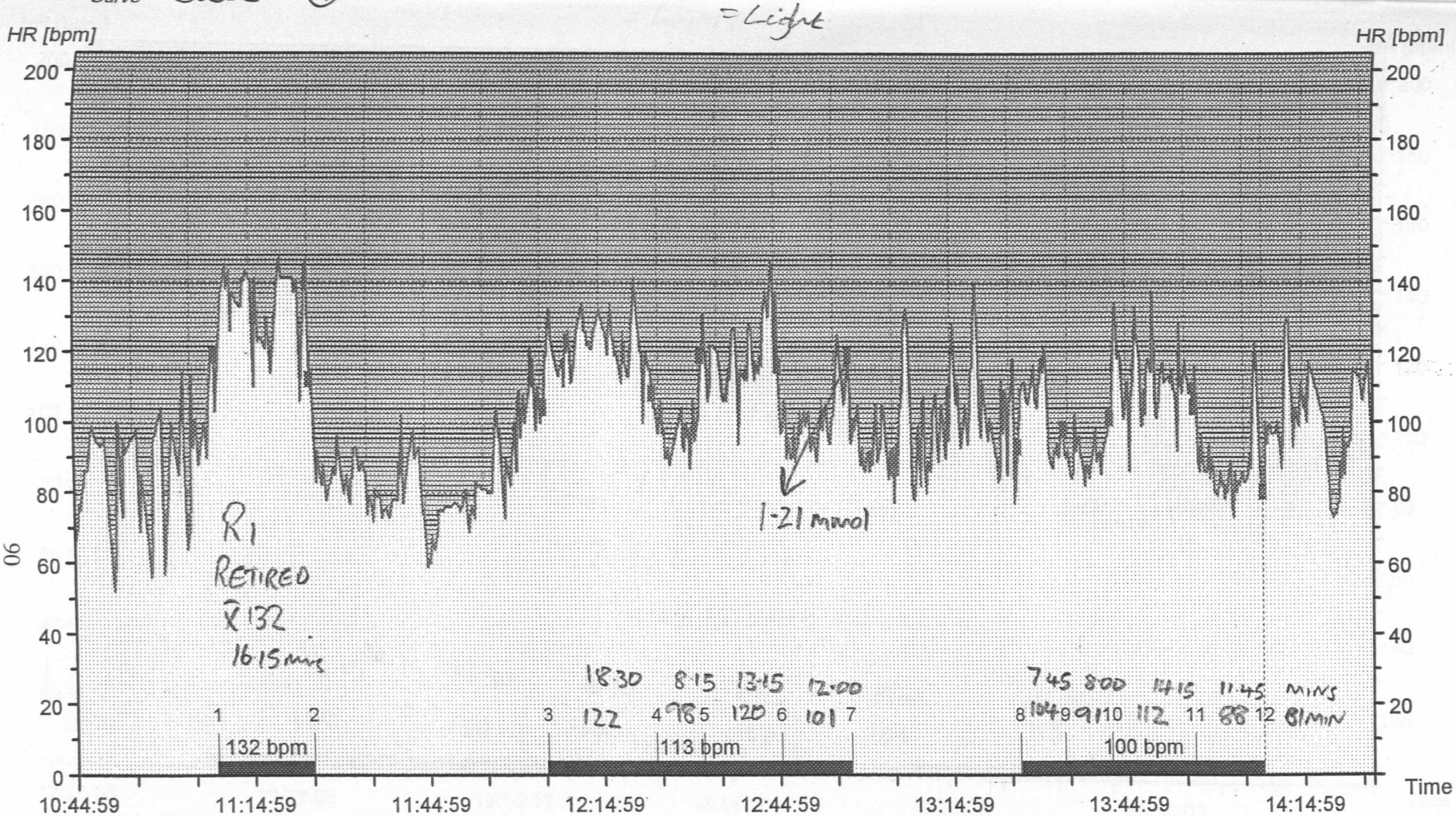


Person	SUB 3	Date	21/02/1994	Heart rate avera	129 bpm		
Exercise		Time	09:26:18	Heart rate max	157 bpm		
Sport		Duration	5:33:30.0				
Note	Hayling (cold) 21/2/94. 5-8 knots			Selection	12:06:03 - 12:56:03 (0:50:00.0)		



Person	SUB 3	Date	21/02/1994	Heart rate avera	119 bpm		
Exercise		Time	09:26:18	Heart rate max	146 bpm		
Sport		Duration	5:33:30.0				
Note	Hayling (cold) 21/2/94. 5-8 knots			Selection	13:20:48 - 14:09:48 (0:49:00.0)		

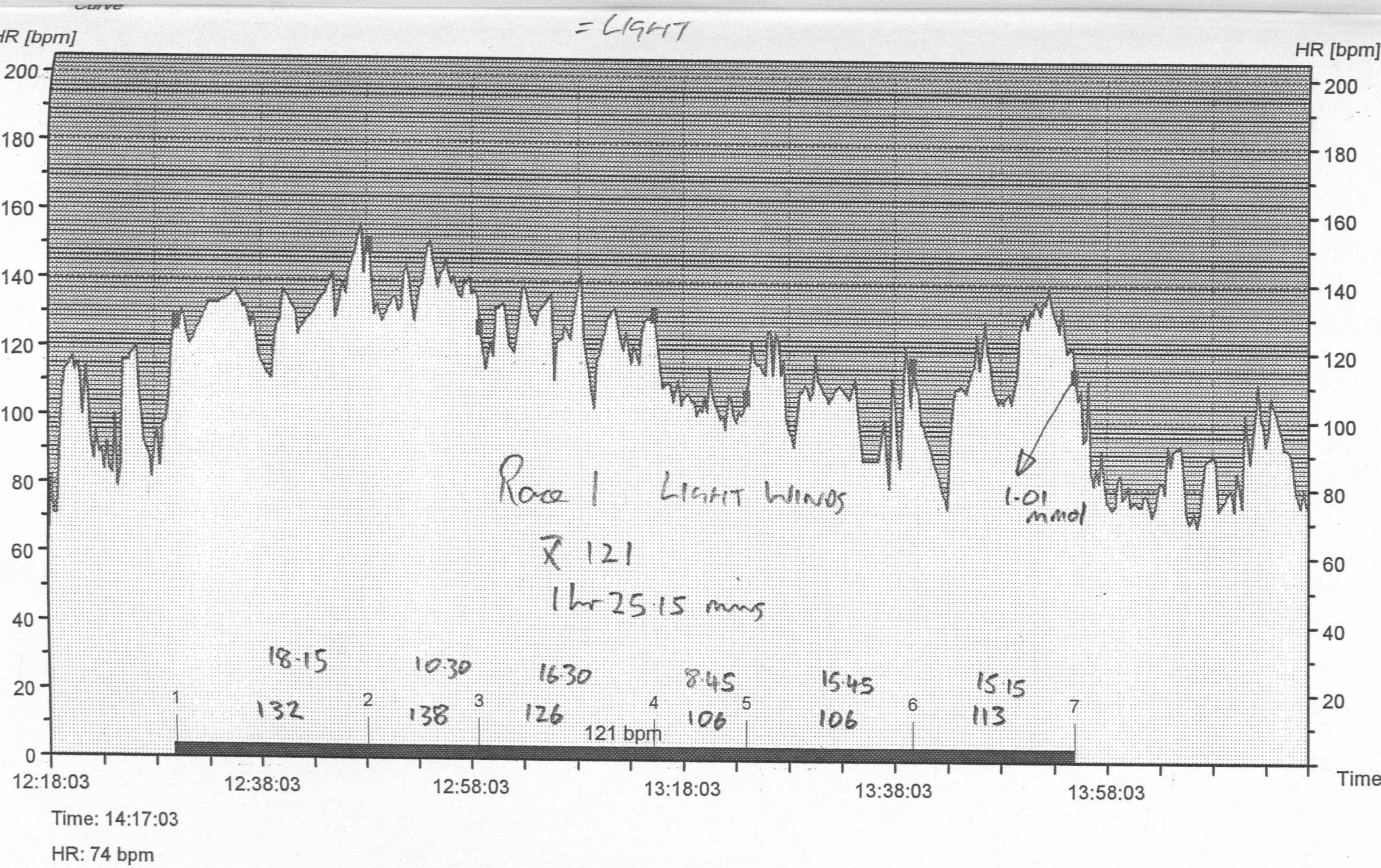
Curve SUBJECT 4



Time: 14:08:14

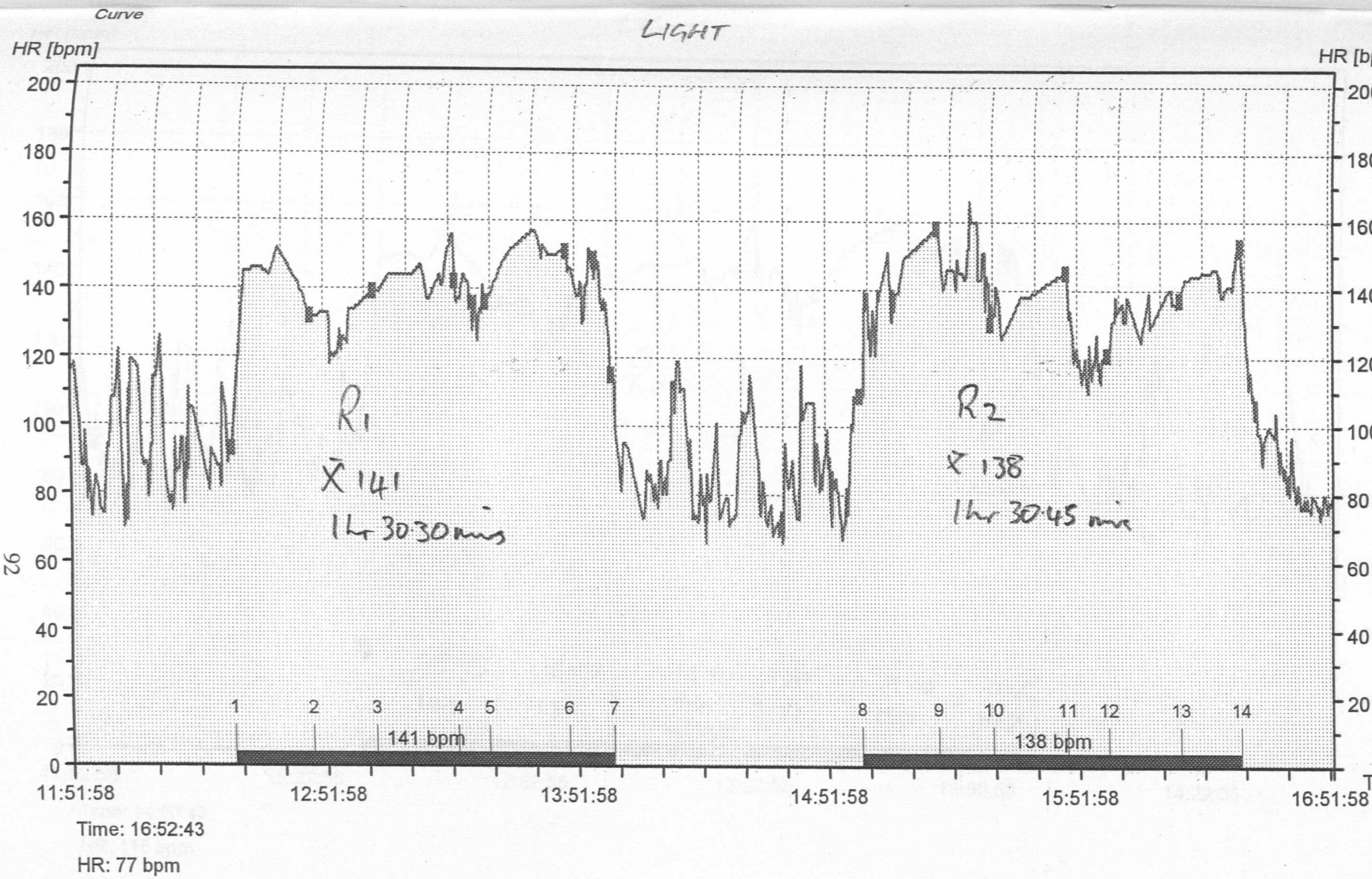
HR: 80 bpm

Person	SUB 4	Date	21/02/1994	Heart rate avera	111 bpm		
Exercise		Time	09:20:59	Heart rate max	147 bpm		
Sport		Duration	5:34:45.0				
Note	Hayling (cold) 21/2/94. 5-8 knots			Selection	11:08:44 - 14:08:14 (1:50:15.0)		

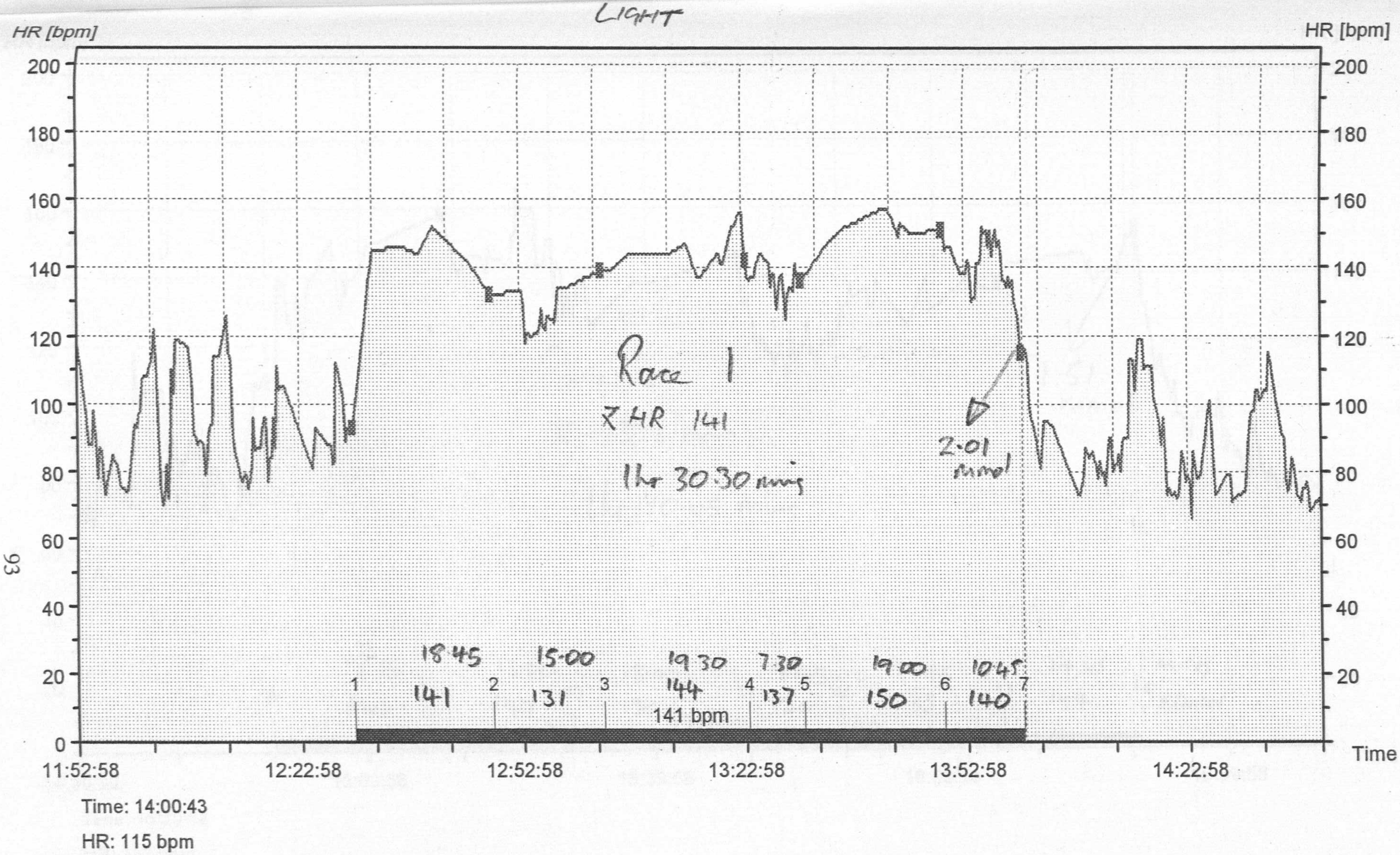


Person	SUB 4	Date	16/06/1994	Heart rate avera	121 bpm		
Exercise		Time	12:17:03	Heart rate max	156 bpm		
Sport		Duration	4:39:45.0				
Note	Hayling Europeans, 16/6/94. R1 10-12 knots decrease 4-8	Selection		12:29:48 - 13:55:03 (1:25:15.0)			

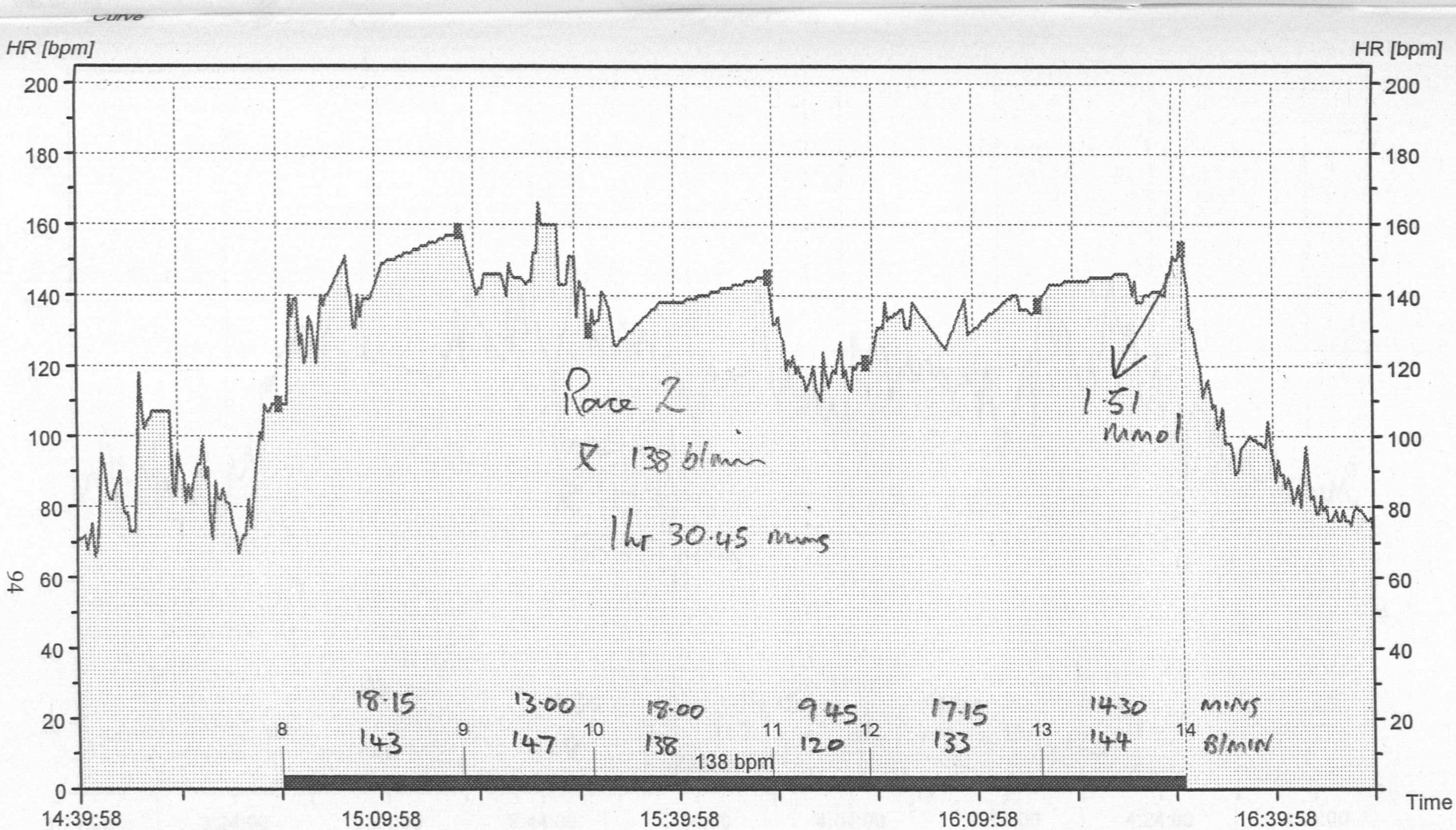
LIGHT



Person	SUB 4	Date	17/06/1994	Heart rate avera	140 bpm		
Exercise		Time	10:39:58	Heart rate max	166 bpm		
Sport		Duration	6:33:45.0				
Note	Havling Europeans. 17/6/94. 8-10 knots decreased 6 knot			Selection	12:30:13 - 16:30:58 (3:01:15.0)		



Person	SUB (4)	Date	17/06/1994	Heart rate avera	141 bpm		
Exercise		Time	10:39:58	Heart rate max	157 bpm		
Sport		Duration	6:33:45.0				
Note	Hayling Europeans, 17/6/94. 8-10 knots decreased 6 knot			Selection	12:30:13 - 14:00:43 (1:30:30.0)		

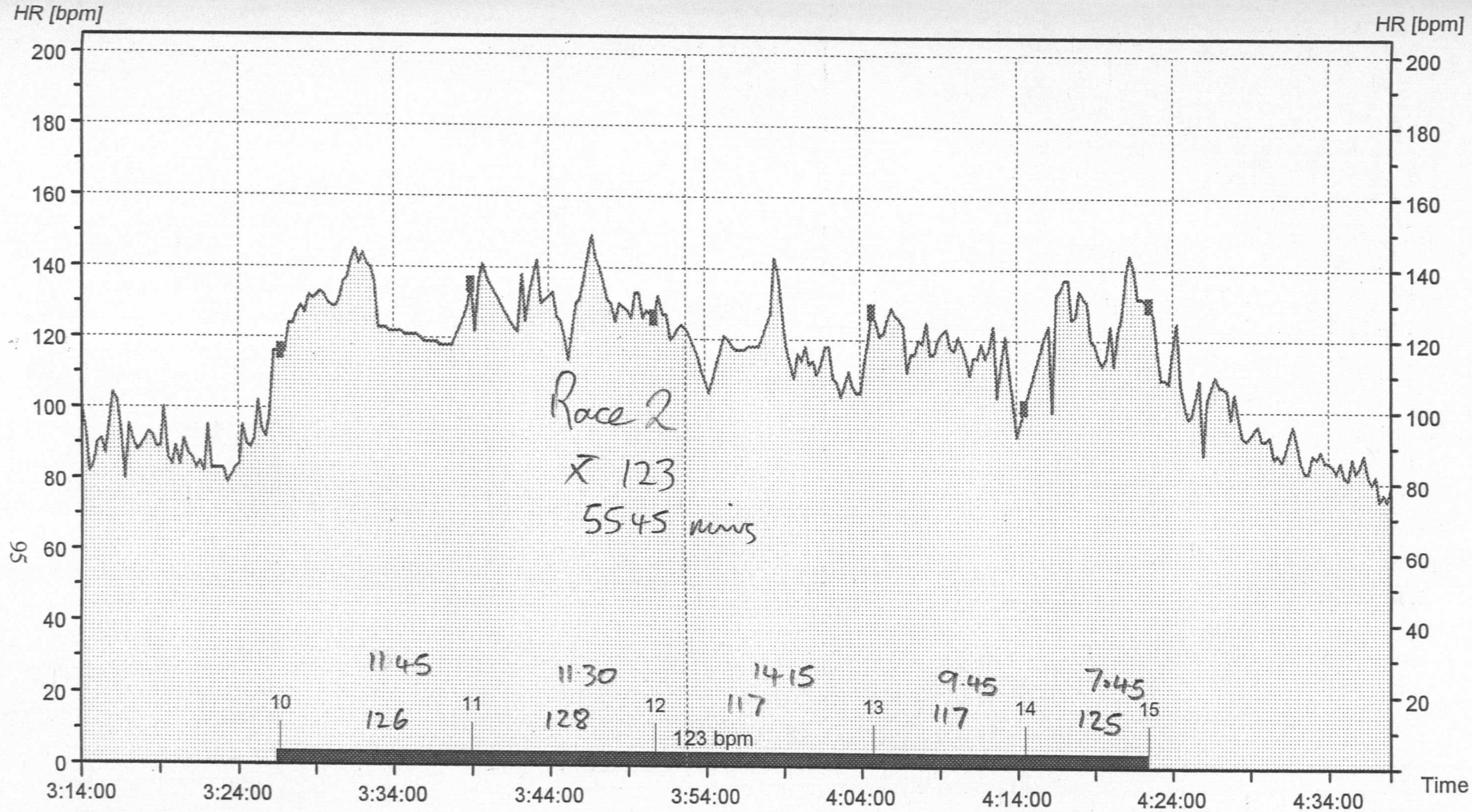


Time: 16:30:58

HR: 153 bpm

Person	SUB 4	Date	17/06/1994	Heart rate avera	140 bpm		
Exercise		Time	10:39:58	Heart rate max	166 bpm		
Sport		Duration	6:33:45.0				
Note	…, Hayling Europeans, 17/6/94. 8-10 knots decreased 6 knot	Selection		12:30:13 - 16:30:58 (3:01:15.0)			

Curve SUBJECT 5 LIGHT

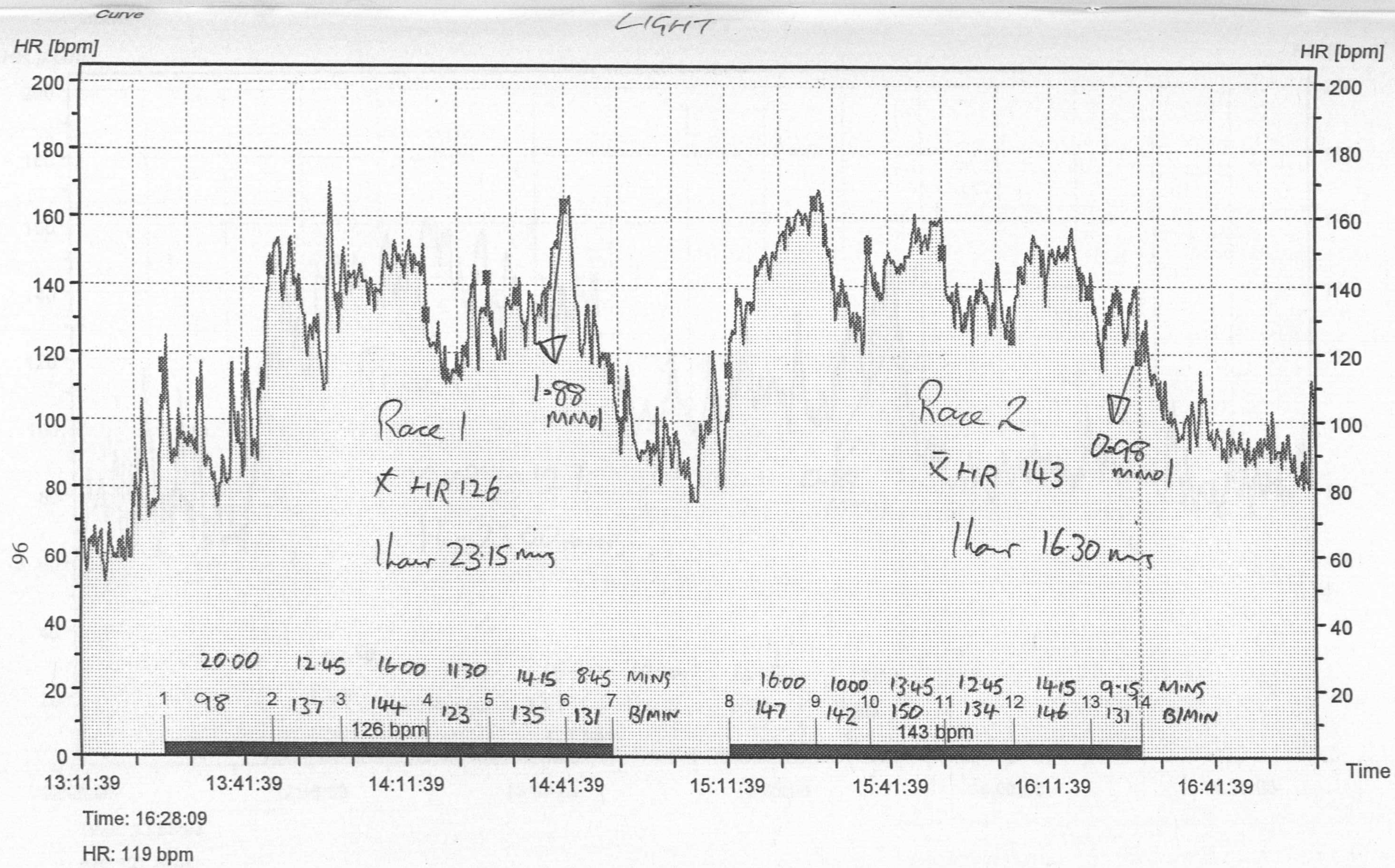


Time: 3:52:45

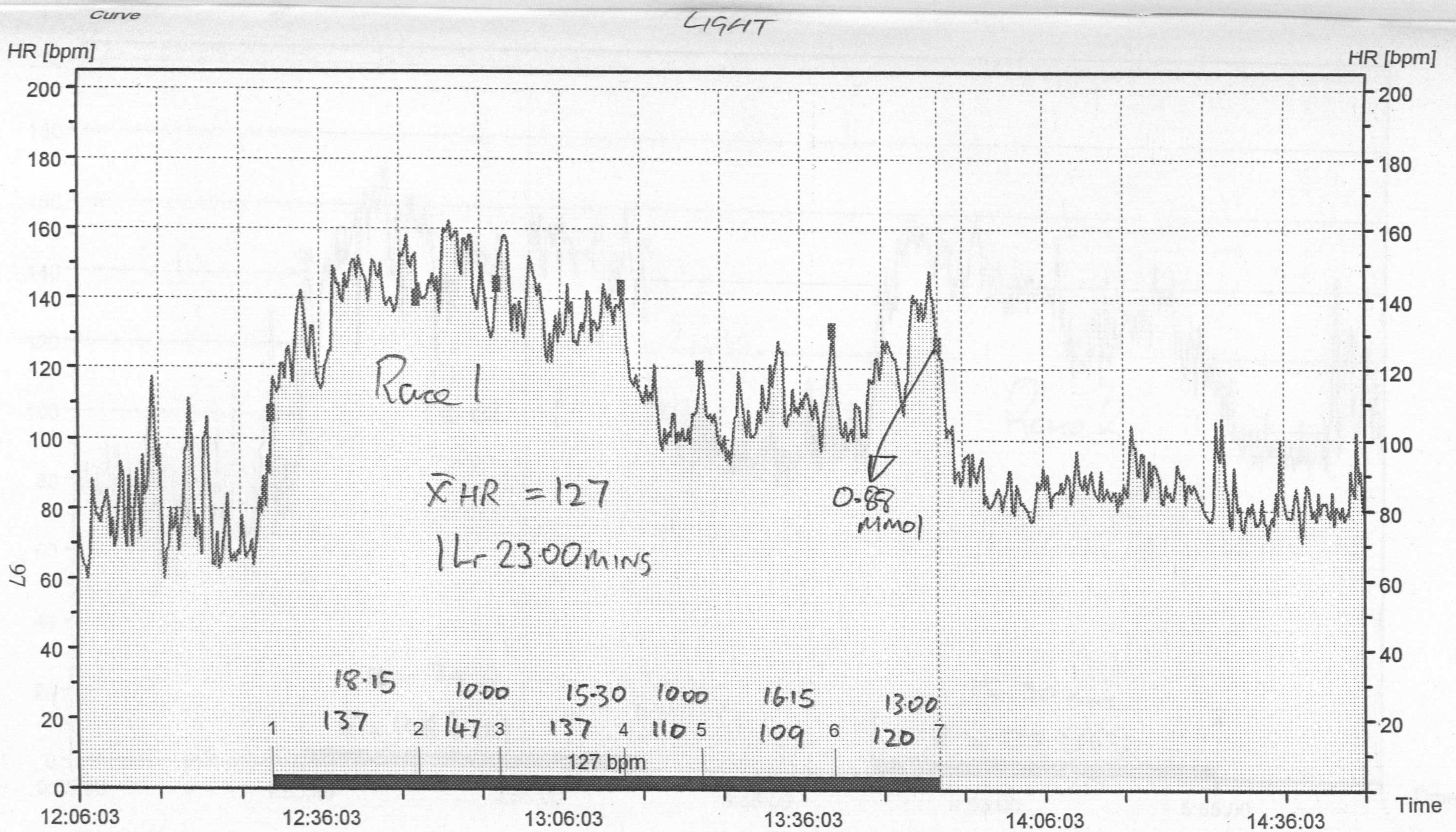
HR: 123 bpm

95

Person	SUBJECT 5	Date	19/02/1994	Heart rate avera	134 bpm		
Exercise		Time	10:32:02	Heart rate max	169 bpm		
Sport		Duration	5:37:15.0				
Note	, Hayling, 19/2/94. 6-8 knots			Selection	1:51:30 - 4:22:30 (1:51:15.0)		



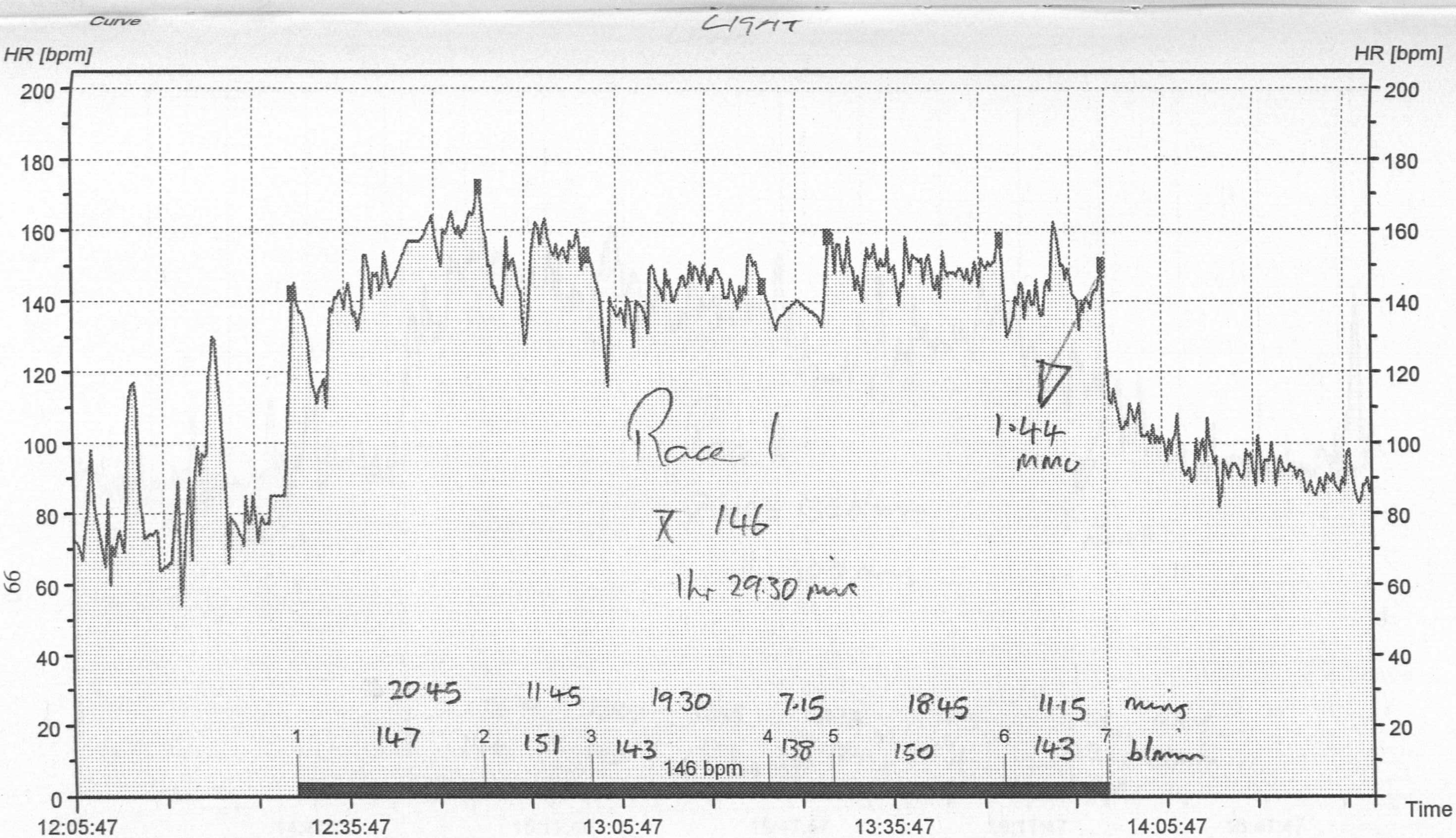
Person	SUBJECT 5	Date	15/06/1994	Heart rate avera	134 bpm		
Exercise		Time	11:20:39	Heart rate max	170 bpm		
Sport		Duration	6:13:30.0				
Note	Havling Europeans. R1:4-6 knots. R2:10 decrease 5-6			Selection	13:27:09 - 16:28:09 (2:39:15.0)		



Time: 13:53:03

HR: 127 bpm

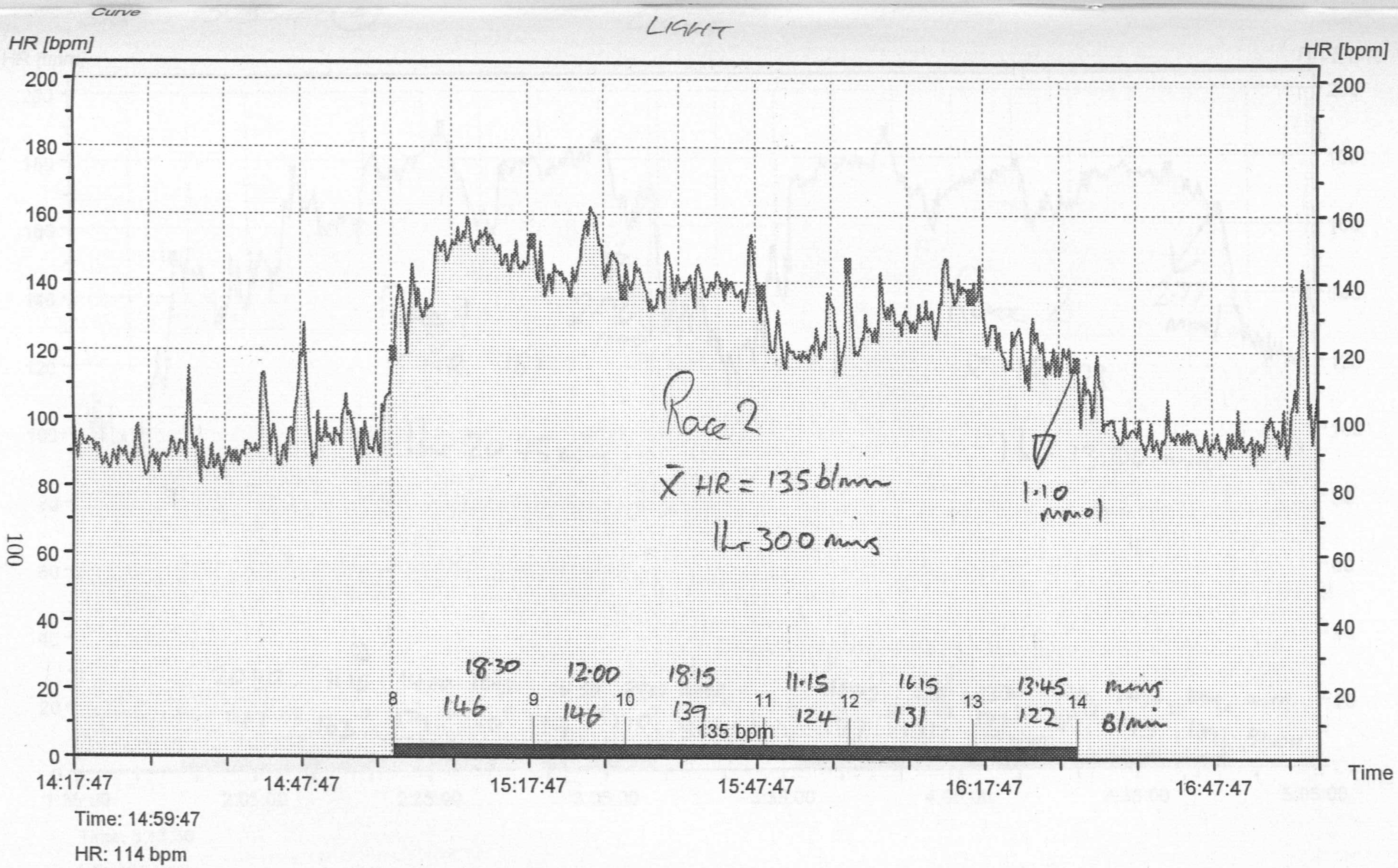
Person	SUBJECT 5	Date	16/06/1994	Heart rate avera	127 bpm		
Exercise		Time	09:25:03	Heart rate max	162 bpm		
Sport		Duration	7:39:30.0				
Note	Hayling Europeans 16/6/94 R1 10-12 knots decrease			Selection	12:30:03 - 13:53:03 (1:23:00.0)		



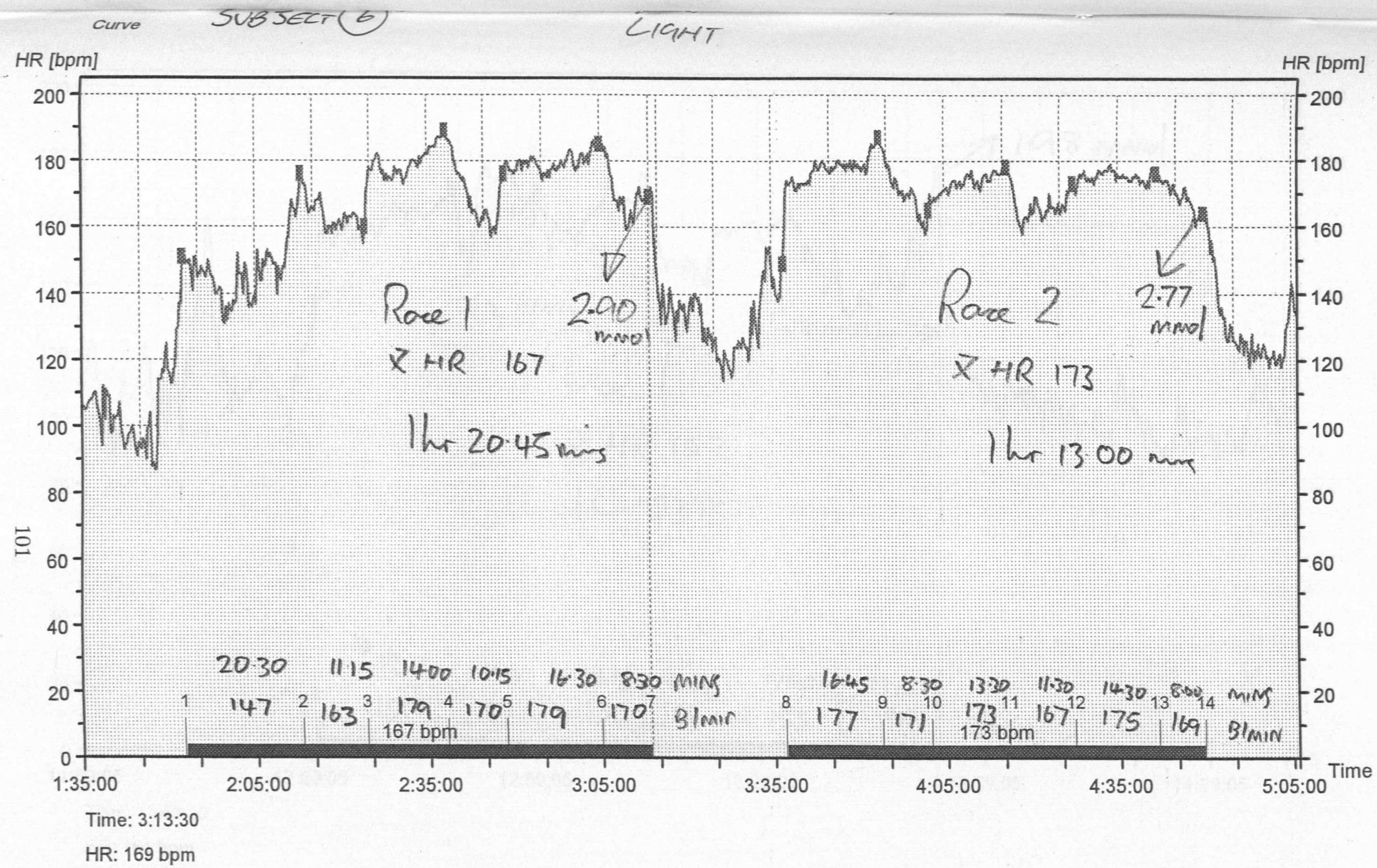
Time: 13:59:32

HR: 131 bpm

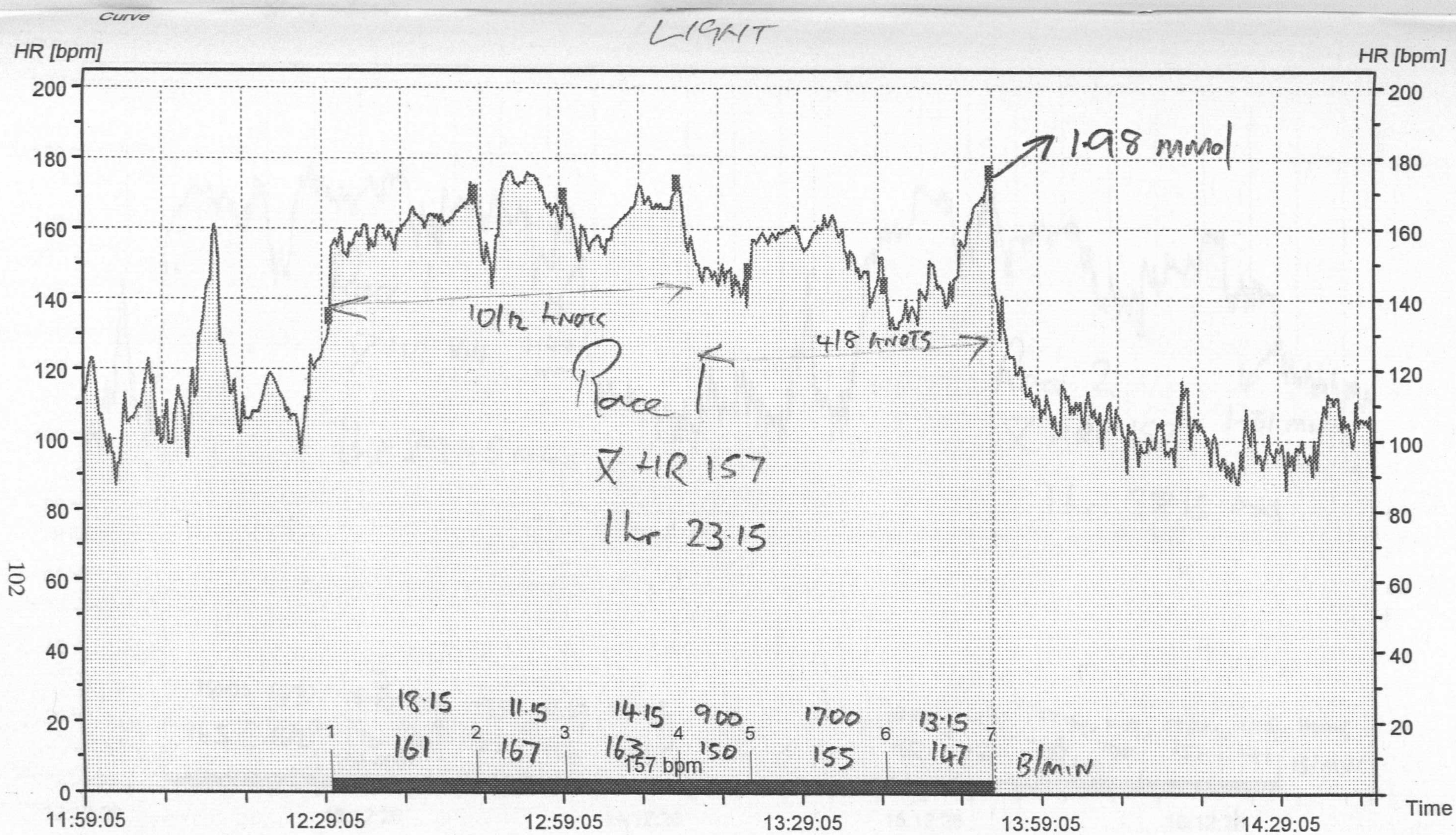
Person	SUBJECT 5	Date	17/06/1994	Heart rate avera	146 bpm		
Exercise	17-6	Time	10:34:47	Heart rate max	172 bpm		
Sport		Duration	6:42:45.0				
Note	Hayling Europeans, 17/6/94. 8-10 knots decreased 6-7			Selection	12:30:02 - 13:59:32 (1:29:30.0)		



Person	SUBJECT 5	Date	17/06/1994	Heart rate avera	135 bpm		
Exercise	17-6	Time	10:34:47	Heart rate max	162 bpm		
Sport		Duration	6:42:45.0				
Note	Hayling Europeans, 17/6/94, 8-10 knots decreased 6 kr			Selection	15:00:02 - 16:30:02 (1:30:00.0)		



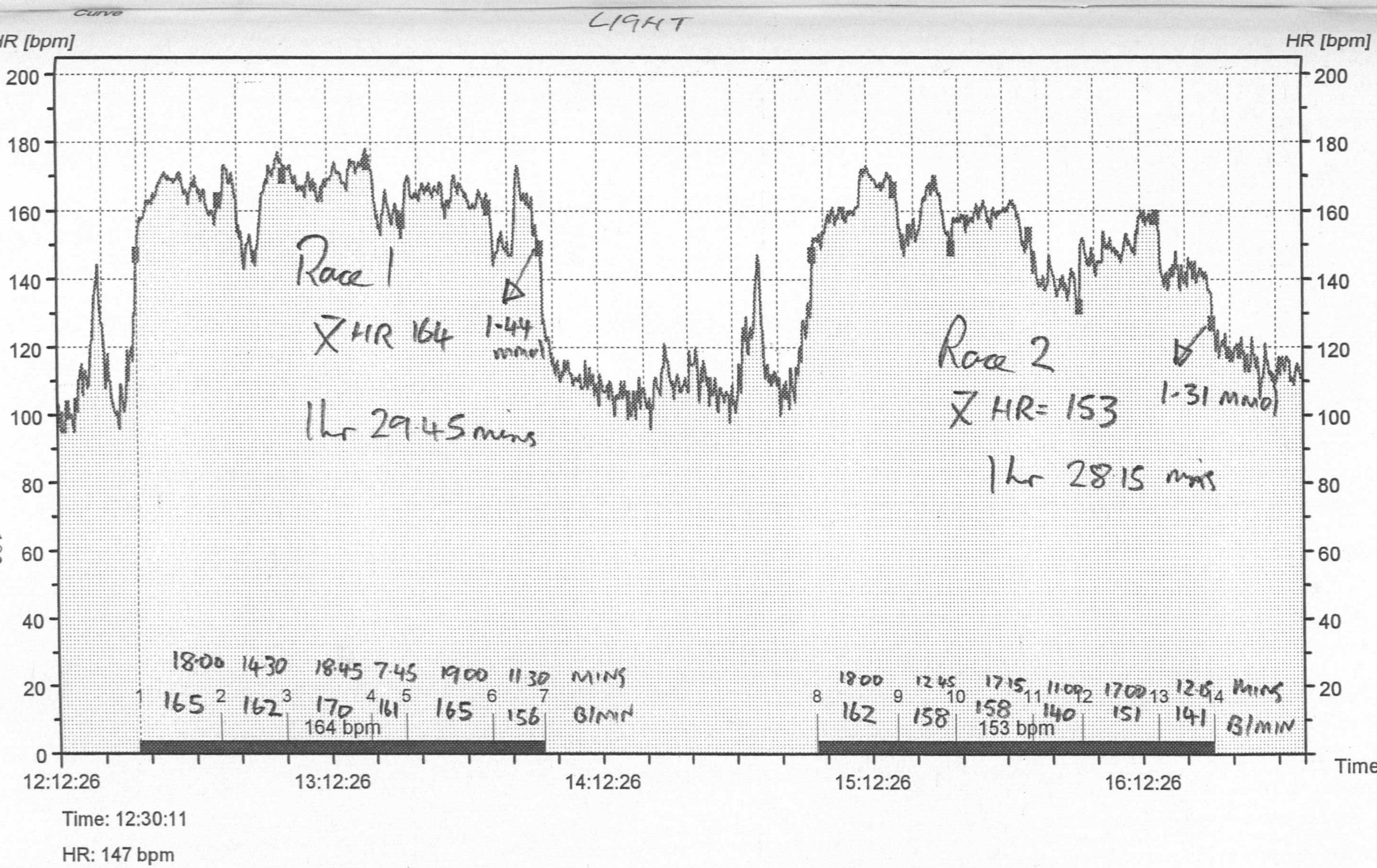
Person	SUBSECT 6	Date	15/06/1994	Heart rate avera	170 bpm		
Exercise	15-6	Time	11:34:58	Heart rate max	189 bpm		
Sport		Duration	5:49:45.0				
[illegible]	[illegible]			Selection	1:52:45 - 4:49:45 (2:33:15.0)		



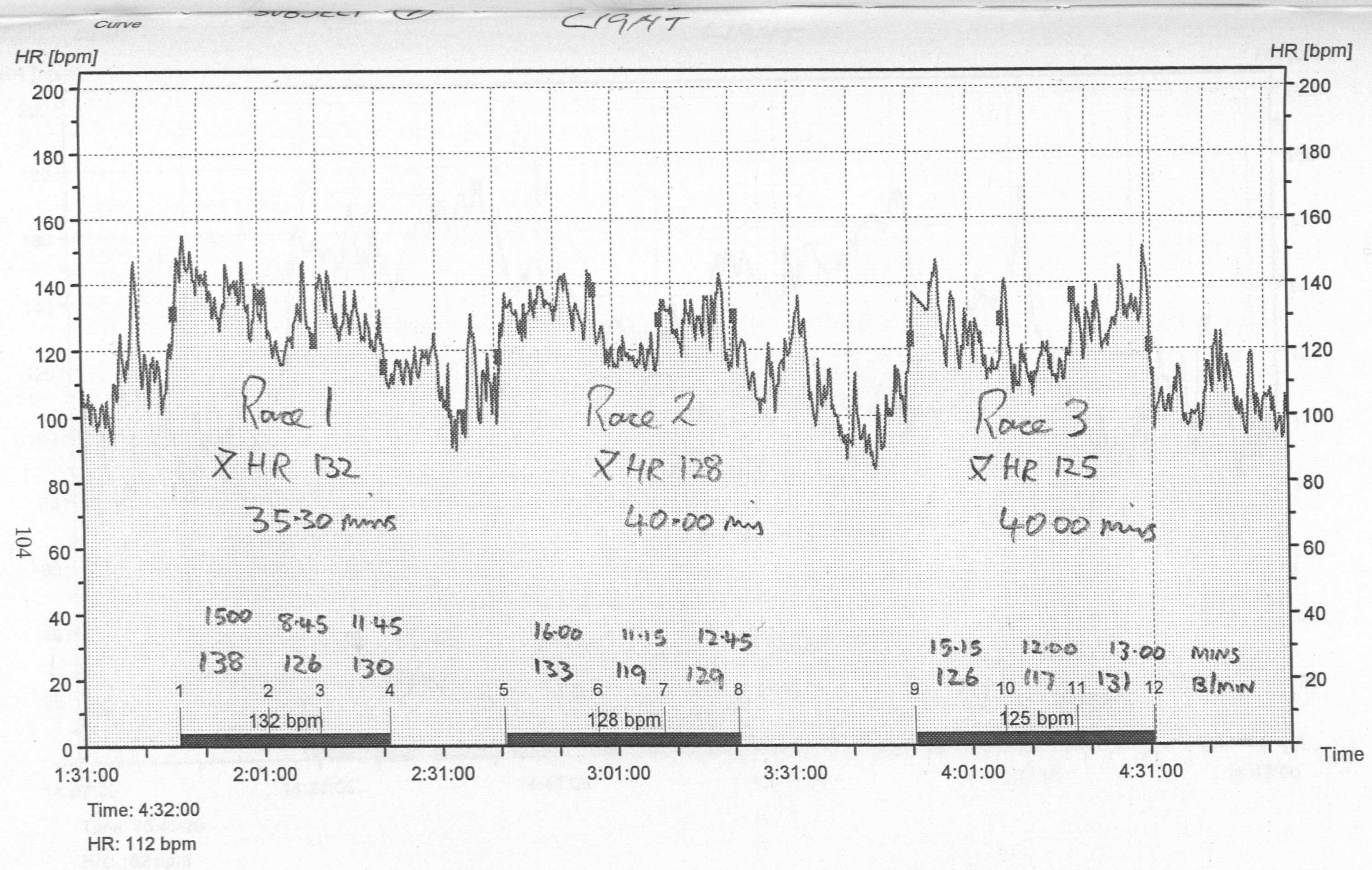
Time: 13:53:20

HR: 161 bpm

Person	SUBJECT (6)	Date	16/06/1994	Heart rate avera	157 bpm		
Exercise	-16-6	Time	09:16:05	Heart rate max	176 bpm		
Sport	[illegible]	Duration	7:48:30.0				
Note	Hayling Europeans 16/6/94 R1 10-12 knots decrease 4-8			Selection	12:30:05 - 13:53:20 (1:23:15.0)		

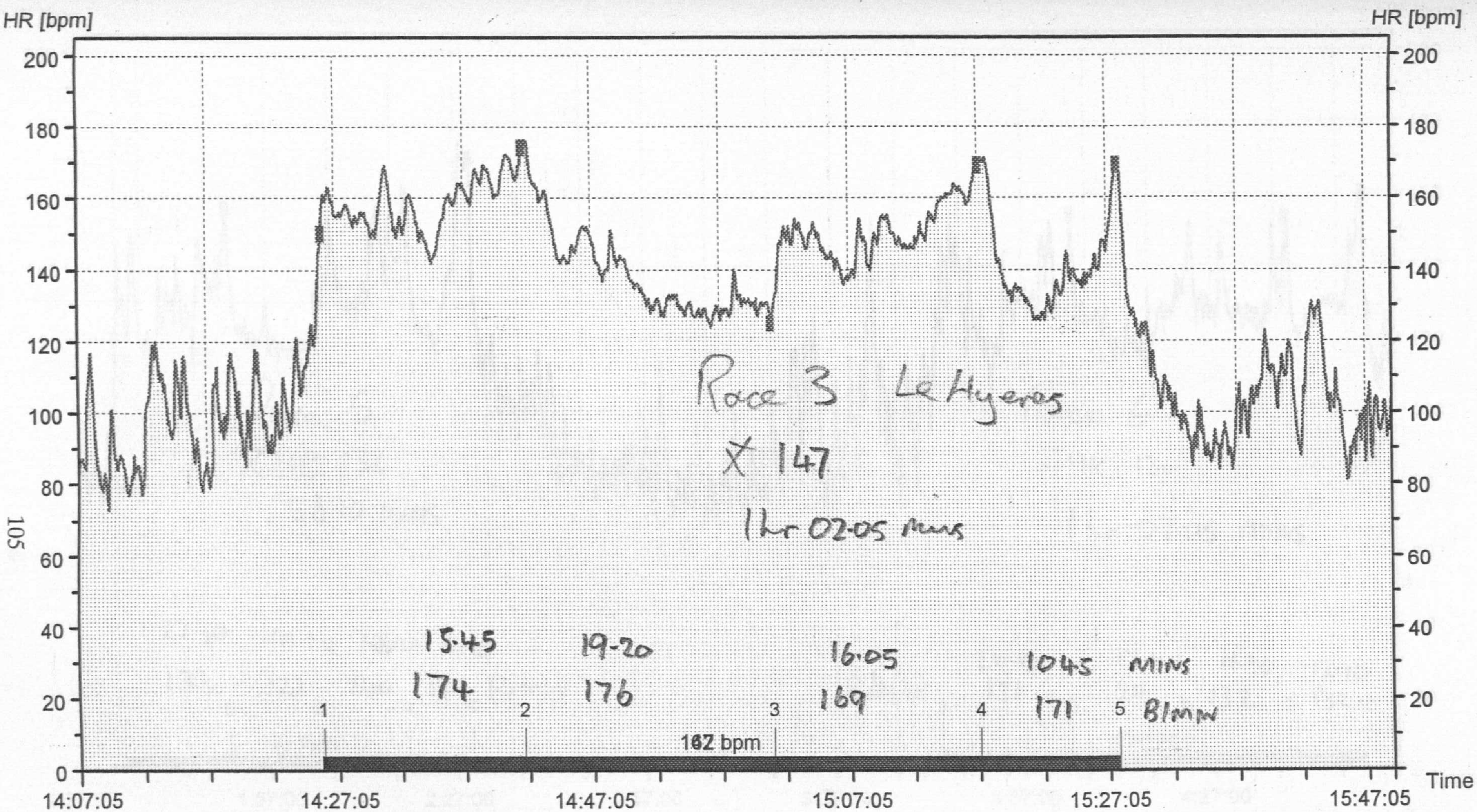


Person	SUBJECT 6	Date	17/06/1994	Heart rate avera	158 bpm		
Exercise	17-6	Time	10:24:26	Heart rate max	178 bpm		
Sport		Duration	6:55:15.0				
Note	Havling Europeans. 17/6/94. 8-10 knots decreased 6 knots			Selection	12:29:56 - 16:28:26 (2:57:45.0)		



Person	SUB 7	Date	21/02/1994	Heart rate avera	128 bpm		
Exercise	-21-2	Time	09:25:08	Heart rate max	155 bpm		
Sport	[illegible]	Duration	5:32:45.0				
Note	Havling (cold) 21/2/94 5-8 knots			Selection	1:46:45 4:32:00 (1:55:45.0)		

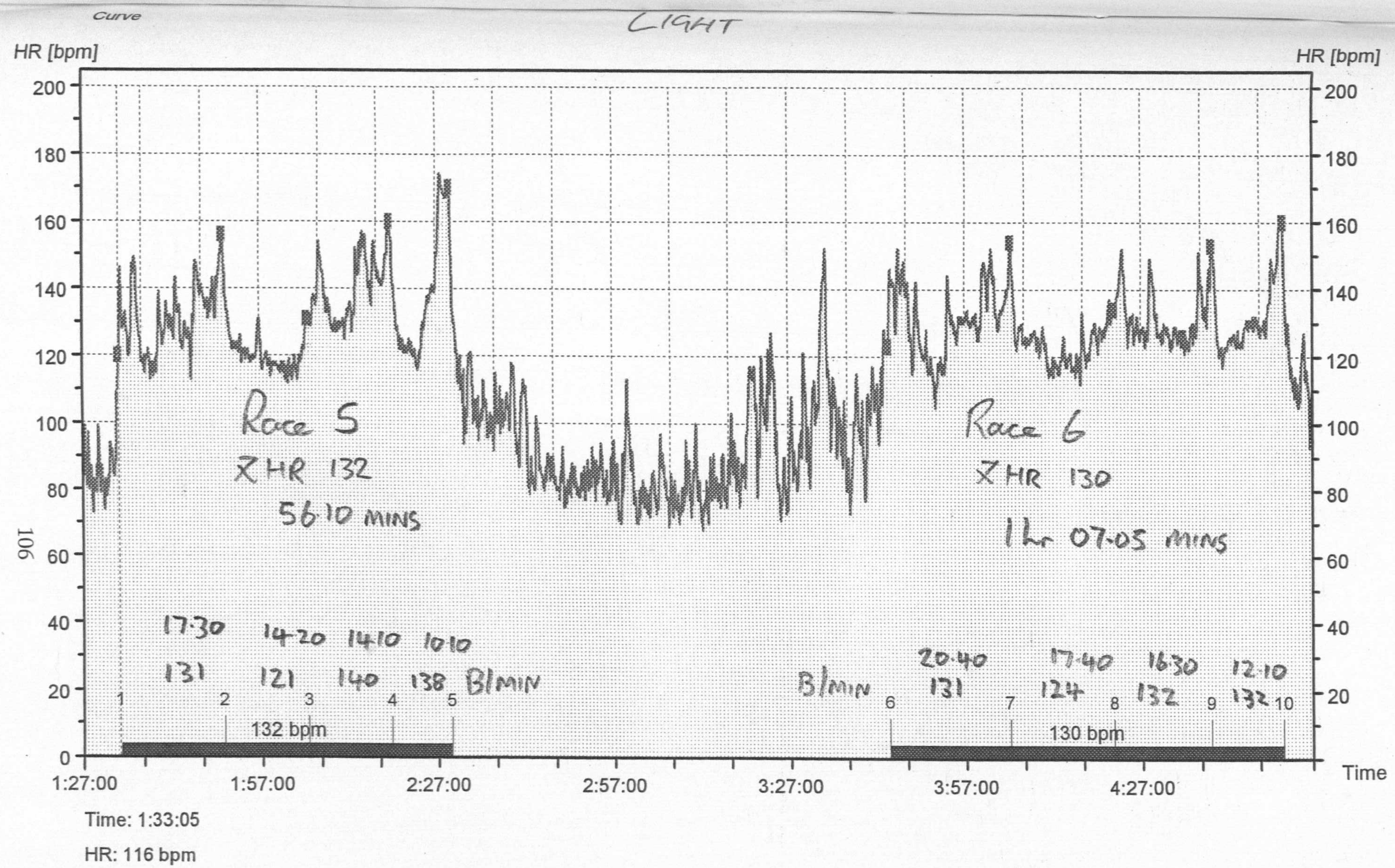
Curve SUBJECT (8) LIGHT



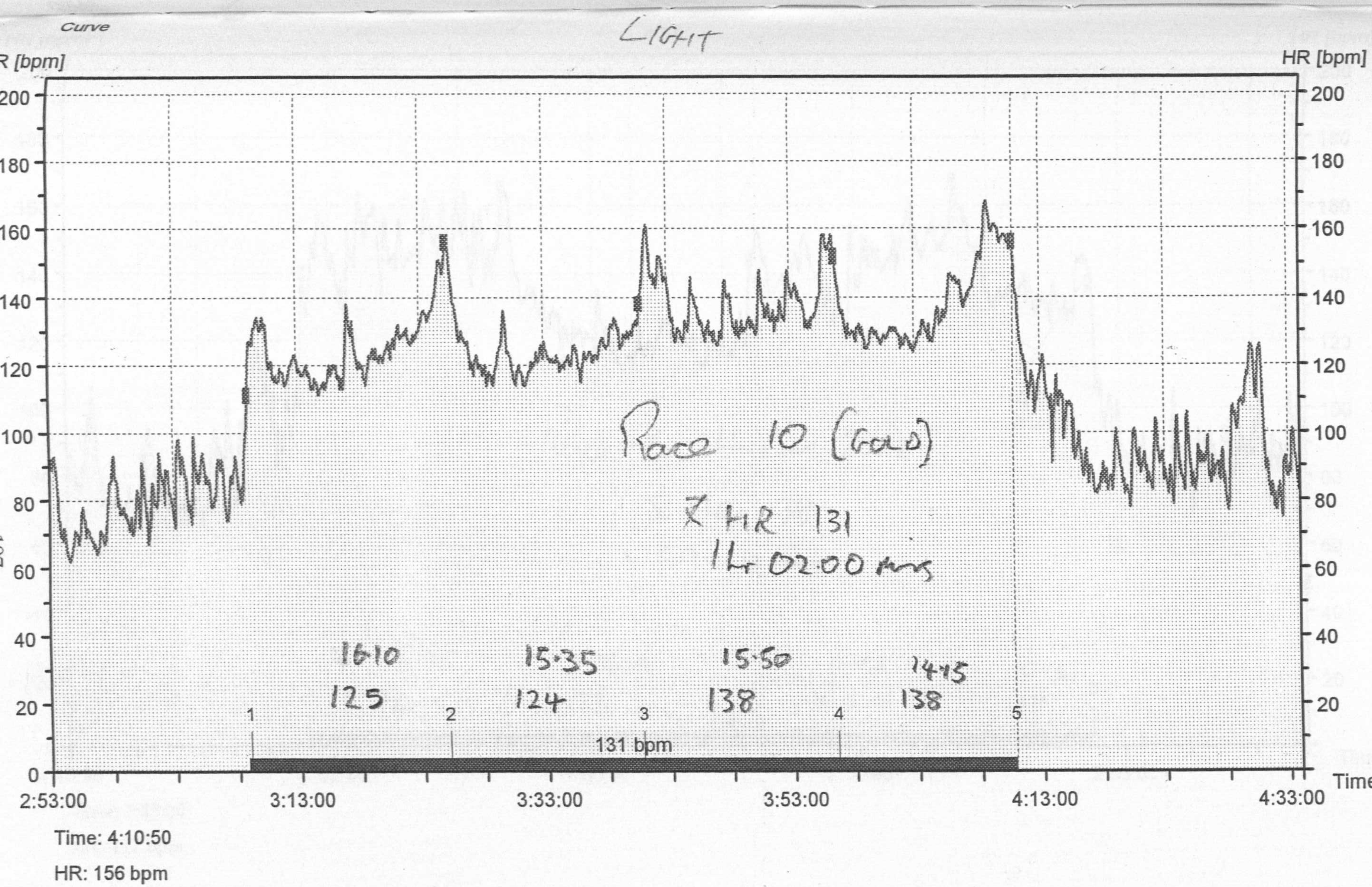
Time: 15:49:20

HR: 102 bpm

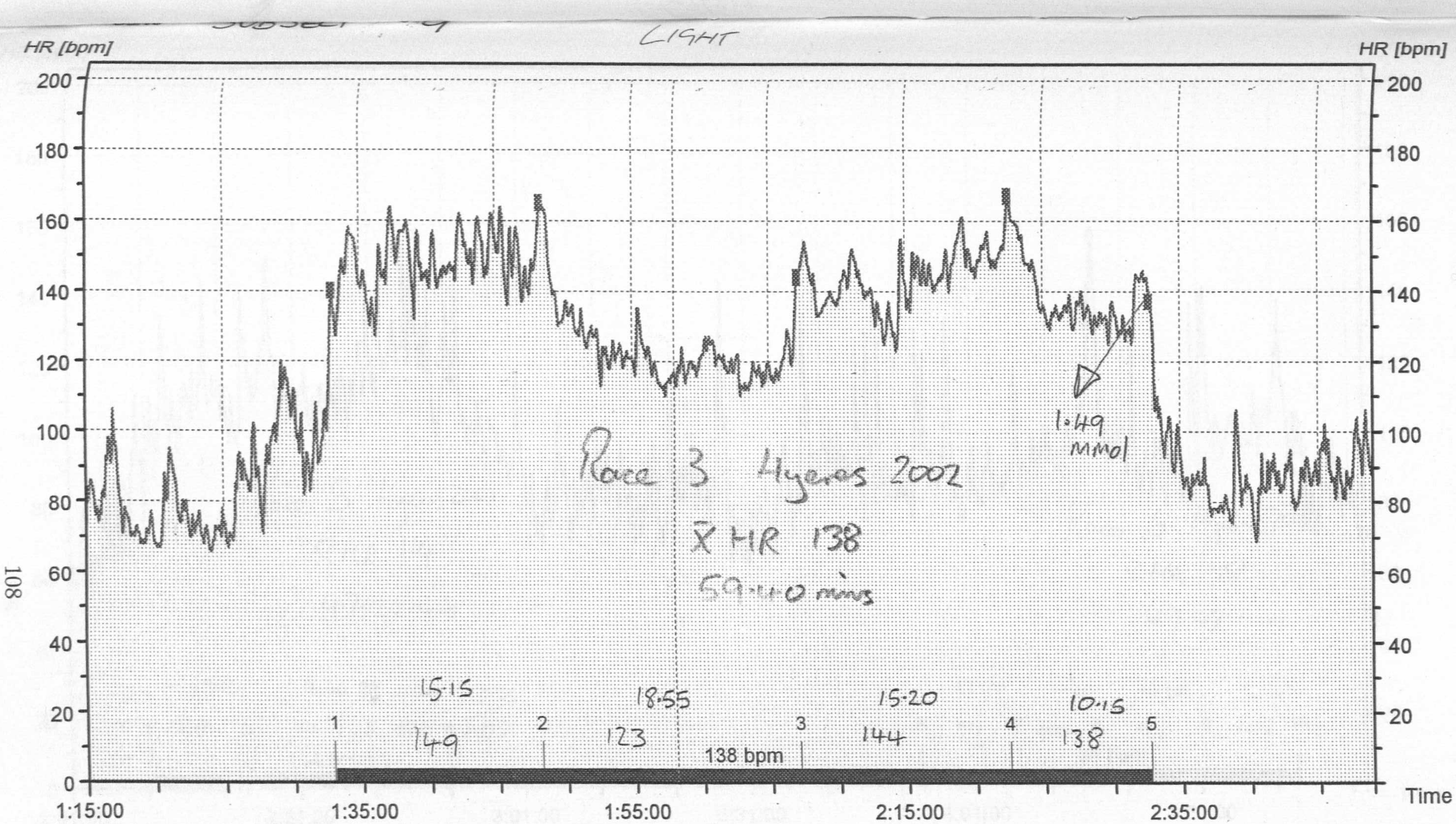
Person	SUBJECT (8)	Date	22/04/2002	Heart rate avera	154 bpm		
Exercise		Time	12:54:05	Heart rate max	180 bpm		
Sport	Sailing	Duration	5:13:55.0				



Person	SUBJECT (8)	Date	23/04/2002	Heart rate avera	131 bpm		
Exercise	23/04/2002 09:40	Time	09:40:46	Heart rate max	174 bpm		
Sport	Sailing	Duration	6:03:40.0				



Person	SUBJECT 8	Date	25/04/2002	Heart rate avera	131 bpm		
Exercise	25/04/2002 11:05	Time	11:05:32	Heart rate max	168 bpm		
Sport	Sailing	Duration	5:12:35.0				
Note	[illegible]						

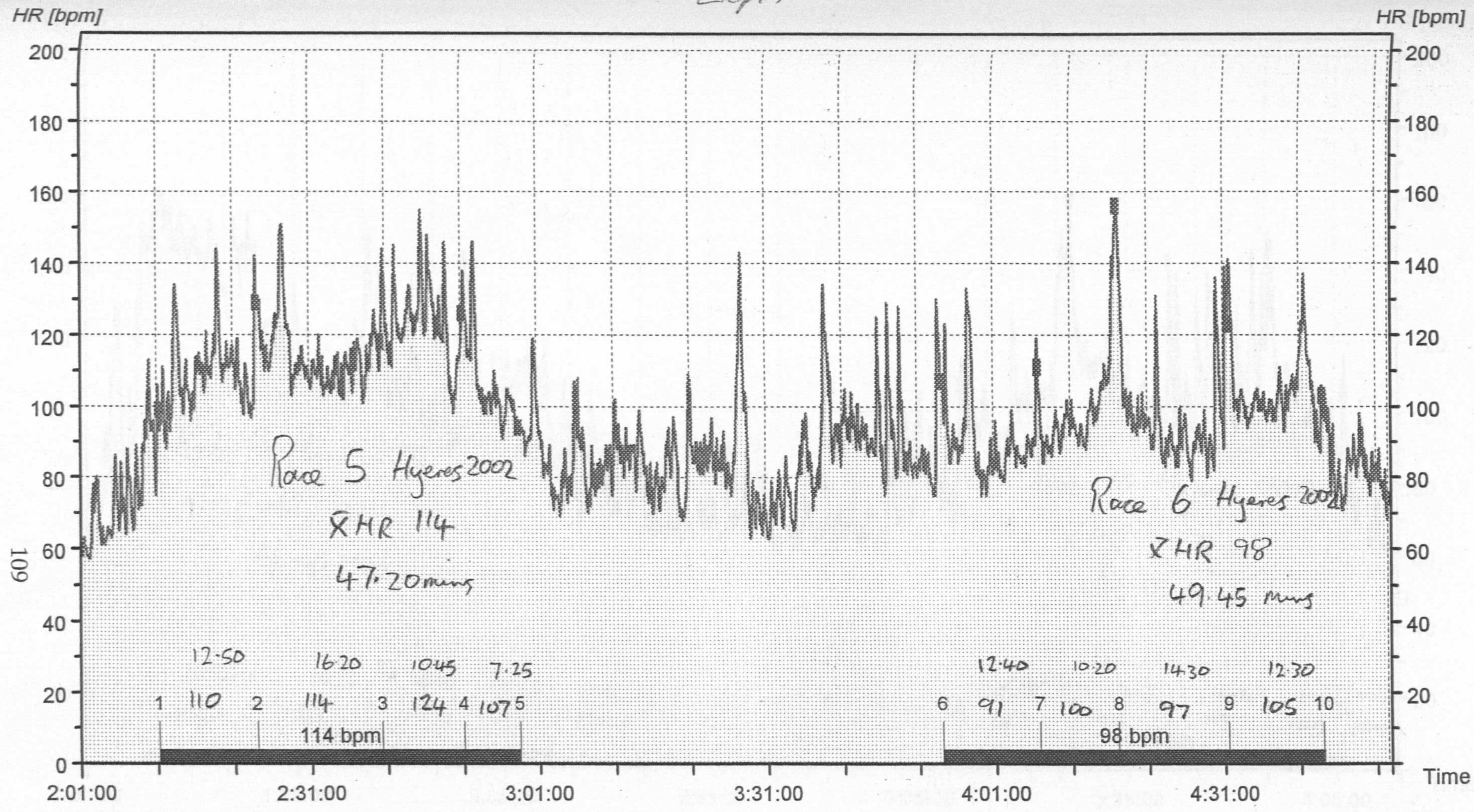


Time: 1:58:05

HR: 117 bpm

Person	SUBJECT 9	Date	22/04/2002	Heart rate avera	138 bpm		
Exercise		Time	12:53:07	Heart rate max	167 bpm		
Sport	Sailing	Duration	4:36:50.0				
Note	Laser Hyeres Races 3 (6-7 Knots). Outer loop			Selection	1:33:05 - 2:32:45 (0:59:40.0)		

LIGHT

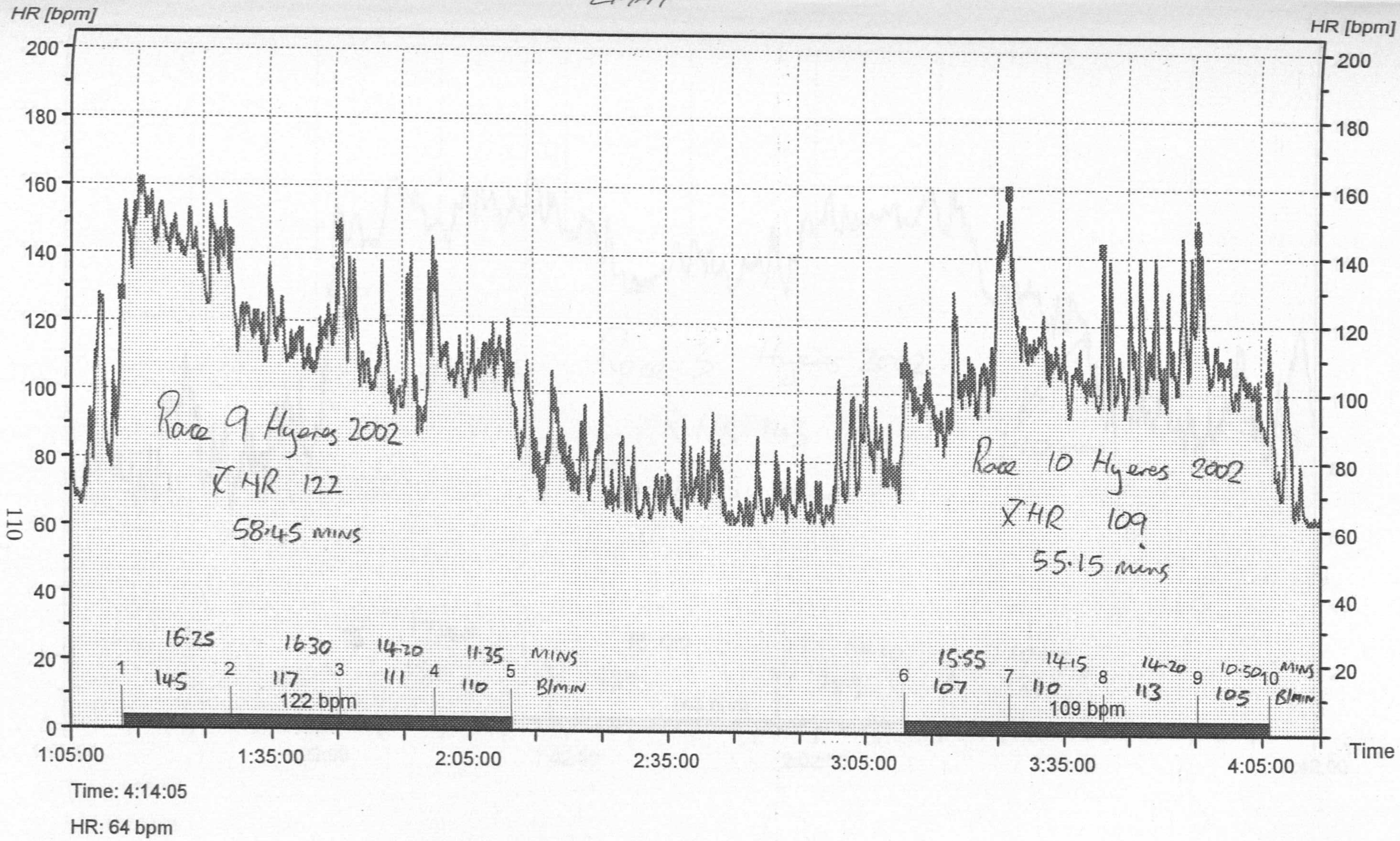


Time: 4:52:30

HR: 68 bpm

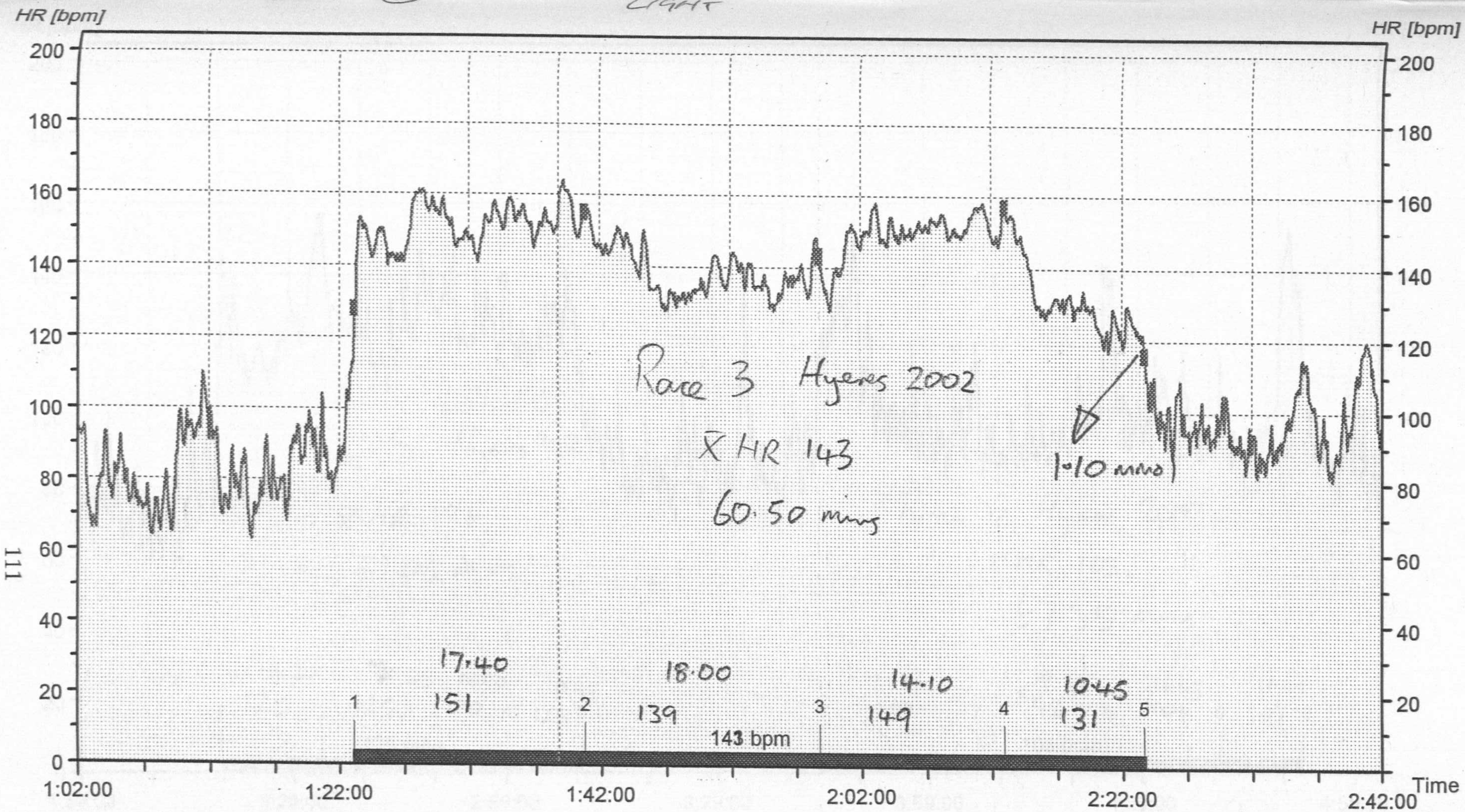
Person	SUBJECT 9	Date	23/04/2002	Heart rate avera	106 bpm		
Exercise	23/04/2002 09:46	Time	09:46:22	Heart rate max	156 bpm		
Sport	Sailing	Duration	5:52:25.0				
Note	Hyres R 5 & 6. 2-8 knots (R6 2-4 knots). 1st & 4th			Selection	2:11:15 - 4:44:10 (1:37:25.0)		

LIGHT



Person	SUBJECT 9	Date	25/04/2002	Heart rate avera	116 bpm		
Exercise	25/04/2002 11:03	Time	11:03:33	Heart rate max	162 bpm		
Sport	Sailing	Duration	5:03:30.0				
Note	Hyres day 5 races 9 (1st) & 10 (2nd) - gold fleet. 6-12 k			Selection	1:12:55 - 4:06:25 (1:54:10.0)		

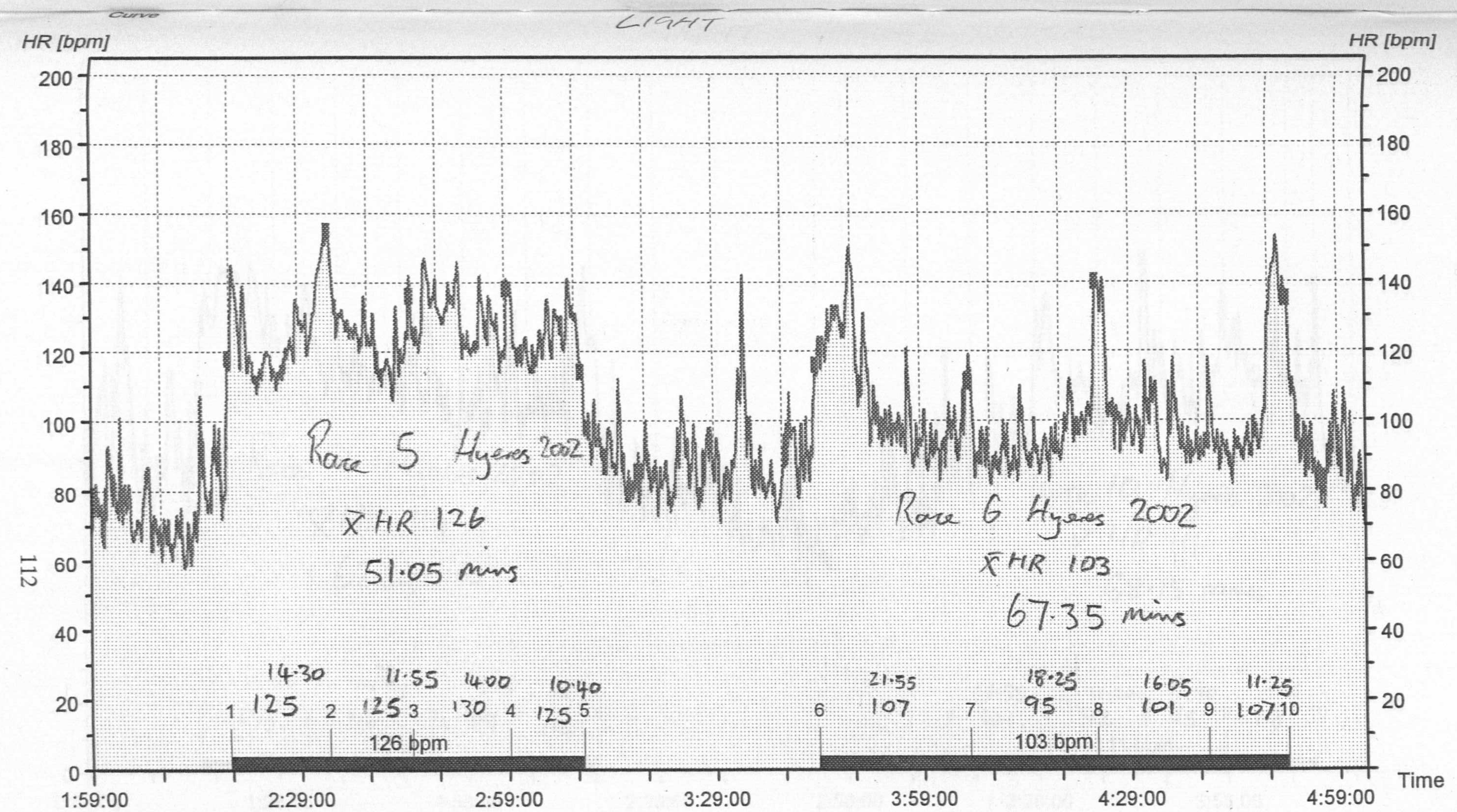
SUBJECT (10) LIGHT



Time: 1:38:50

HR: 151 bpm

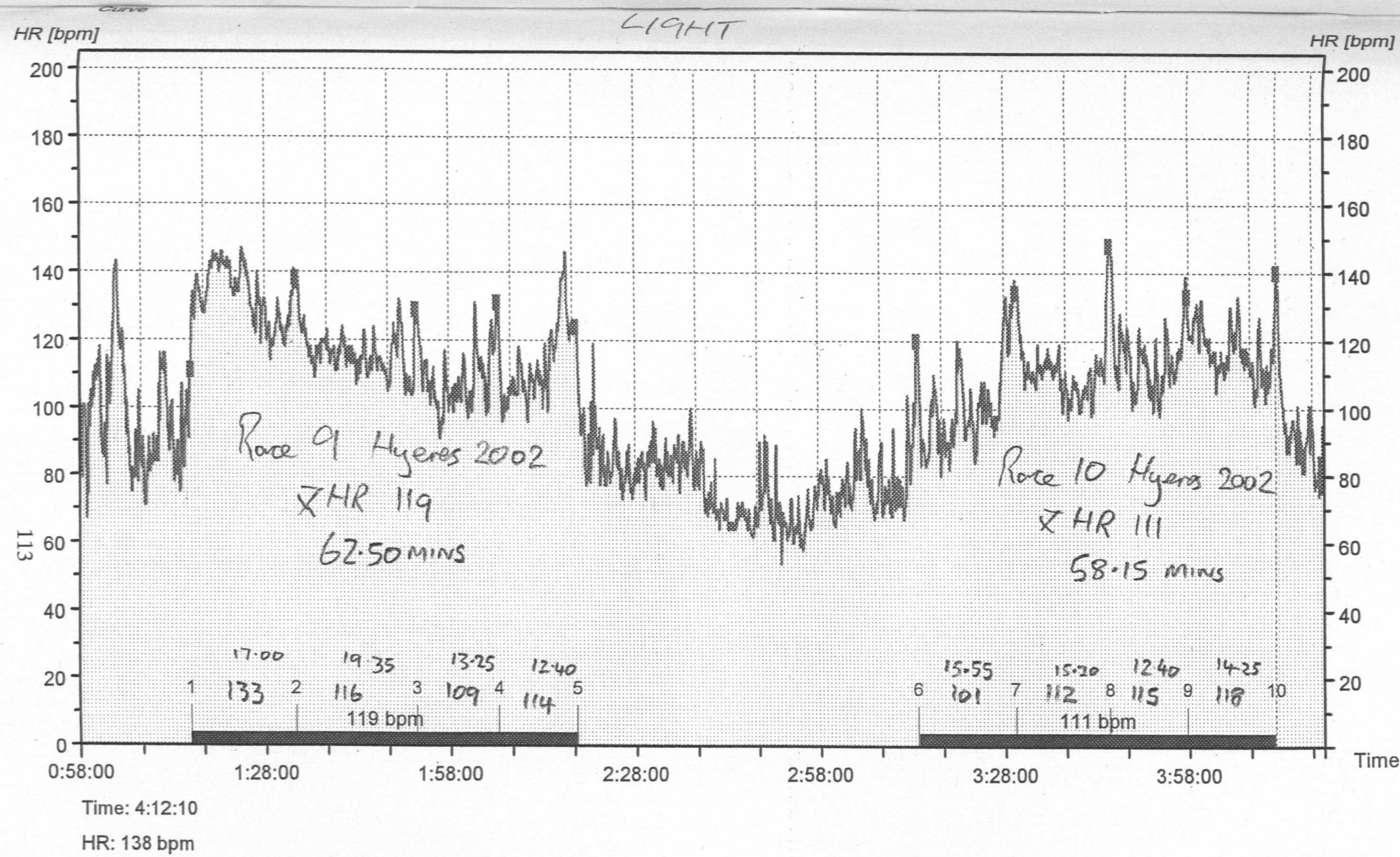
Person	SUBJECT (10)	Date	22/04/2002	Heart rate avera	142 bpm		
Exercise		Time	13:02:43	Heart rate max	164 bpm		
Sport	Sailing	Duration	4:24:20.0				
Note	Laser Hyeres Races 3 (6-7 Knots) Outer loop			Selection	1:23:05 - 3:36:45 (1:53:05.0)		



Time: 5:03:15

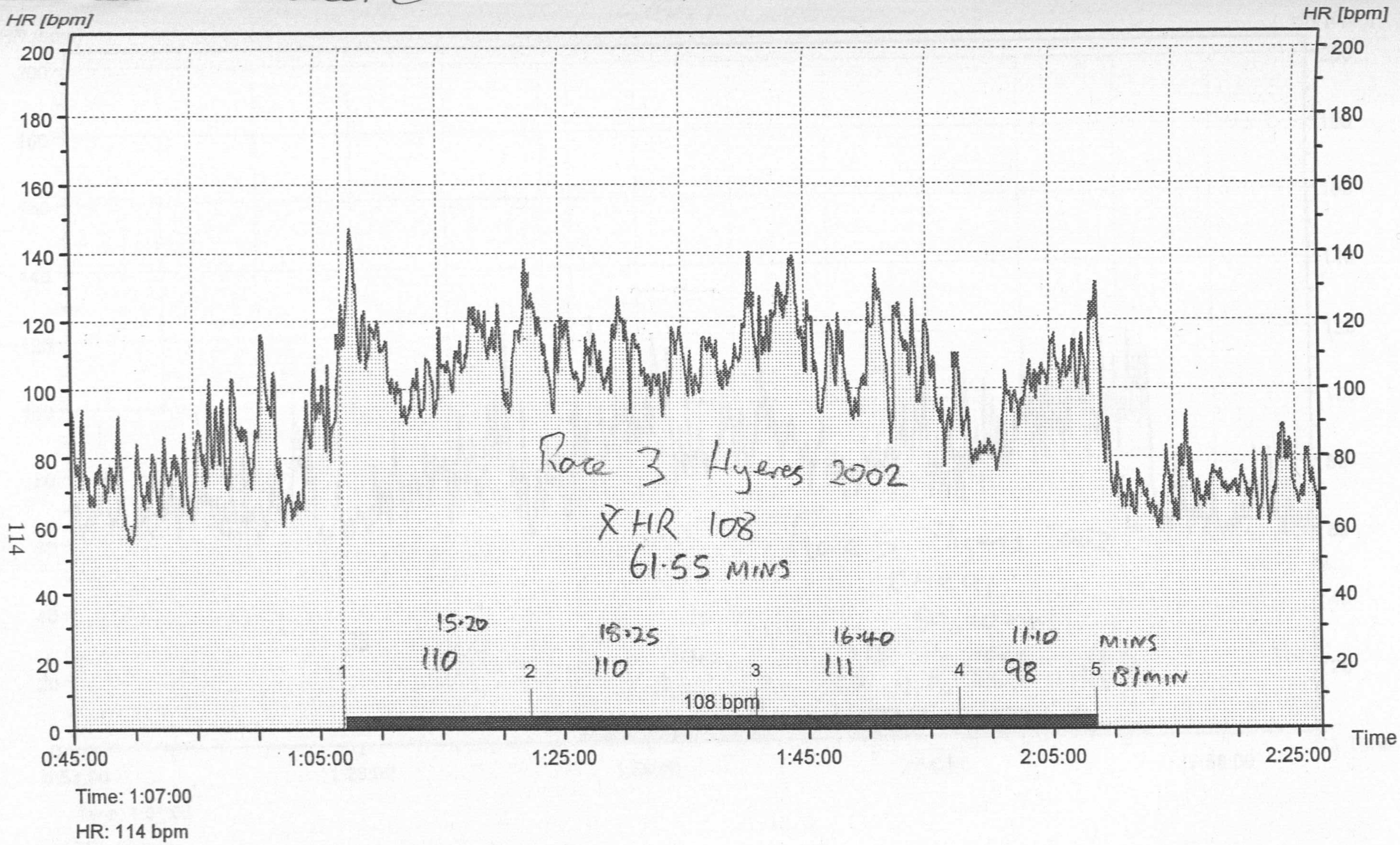
HR: 71 bpm

Person	SUBJECT 10	Date	23/04/2002	Heart rate avera	113 bpm		
Exercise	23/04/2002 09:40	Time	09:40:40	Heart rate max	156 bpm		
Sport		Duration	6:05:25.0				
Note	Hyres R 5 & 6. 2-8 knots (R6 2-4 knots)			Selection	2:18:55 - 4:51:50 (1:59:05.0)		

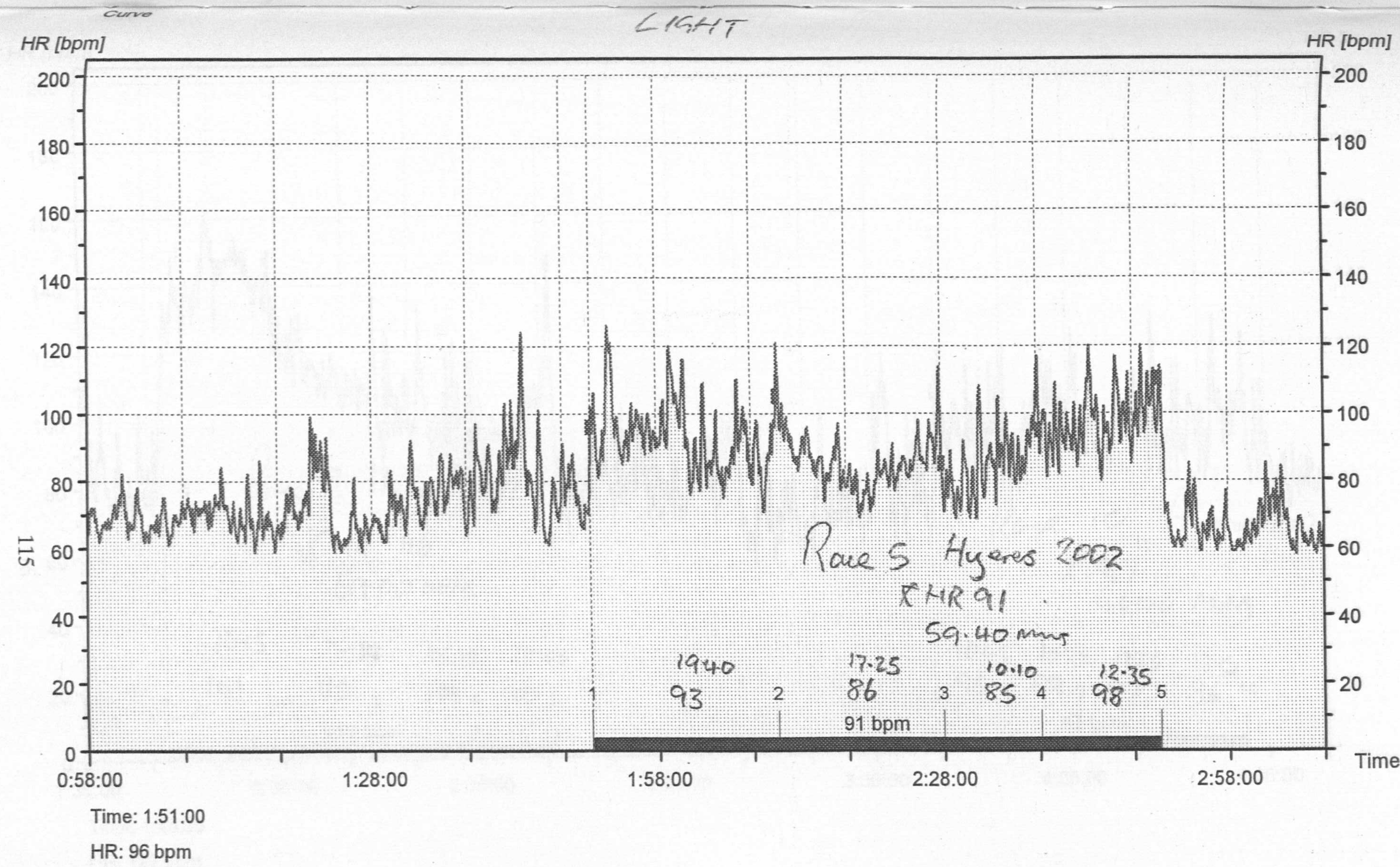


Person	SUBJECT 10	Date	25/04/2002	Heart rate avera	115 bpm		
Exercise	25/04/2002 11:00	Time	11:00:39	Heart rate max	148 bpm		
Sport	Sailing	Duration	5:10:35.0				
Note	Hyres day 5 races 9 & 10 (gold). 6-12 knots - dropped off to			Selection	1:15:50 - 4:12:10 (2:00:55.0)		

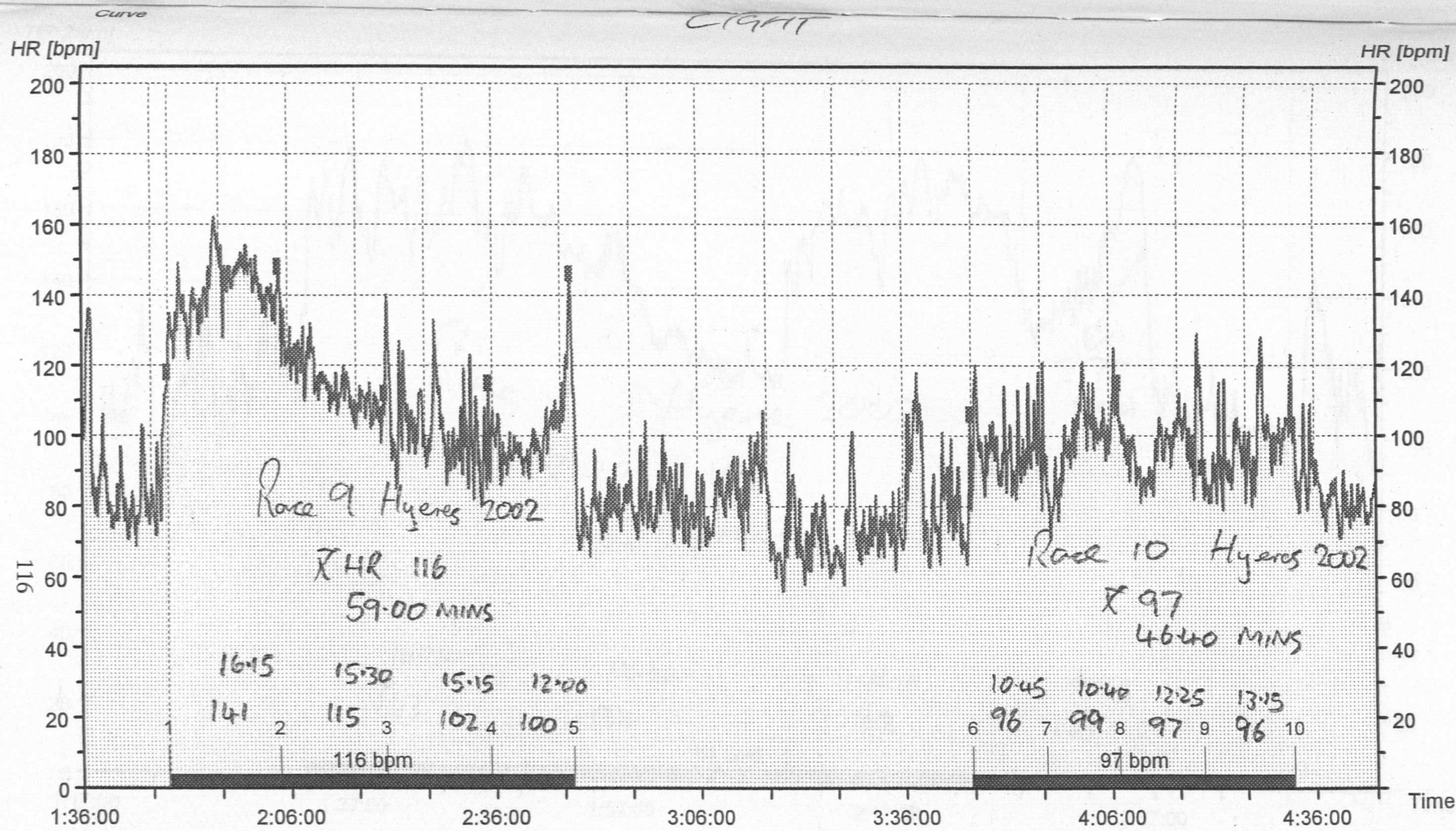
SUBJECT (11) LIGHT



Person	SUBJECT (11)	Date	22/04/2002	Heart rate avera	108 bpm		
Exercise		Time	13:00:30	Heart rate max	147 bpm		
Sport	Sailing	Duration	4:33:35.0				
Note	Laser Hyeres Races 3: 6-7 Knots - Outer loop			Selection	1:07:10 - 2:08:40 (1:01:30.0)		



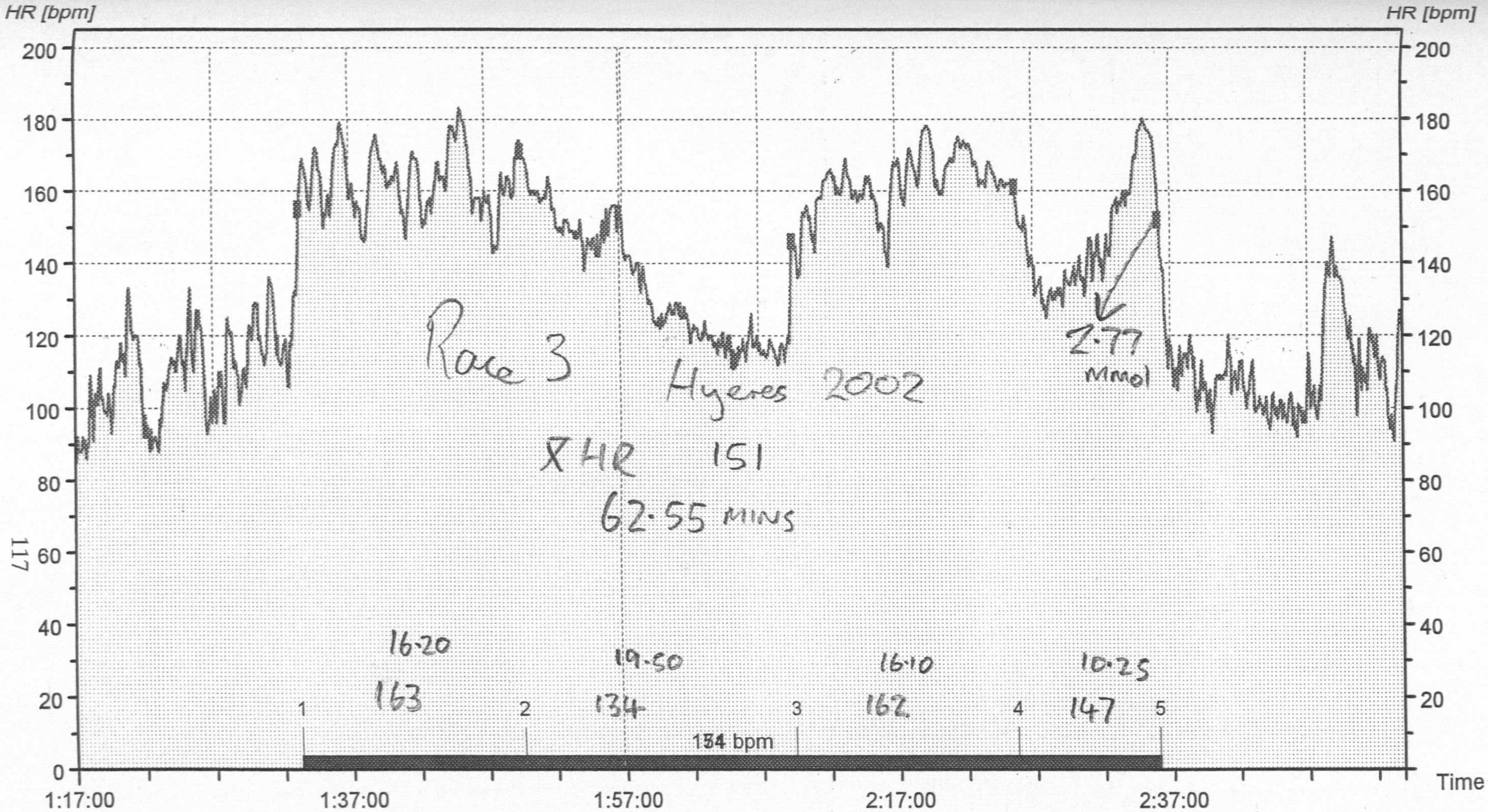
Person	SUBJECT 11	Date	23/04/2002	Heart rate avera	91 bpm		
Exercise	23/04/2002 09:21	Time	09:21:23	Heart rate max	126 bpm		
Sport	Sailing	Duration	6:54:25.0				
Note	Hyeres R 5. 2-8 knots			Selection	1:51:05 - 2:50:45 (0:59:40.0)		



Time: 1:48:35

HR: 127 bpm

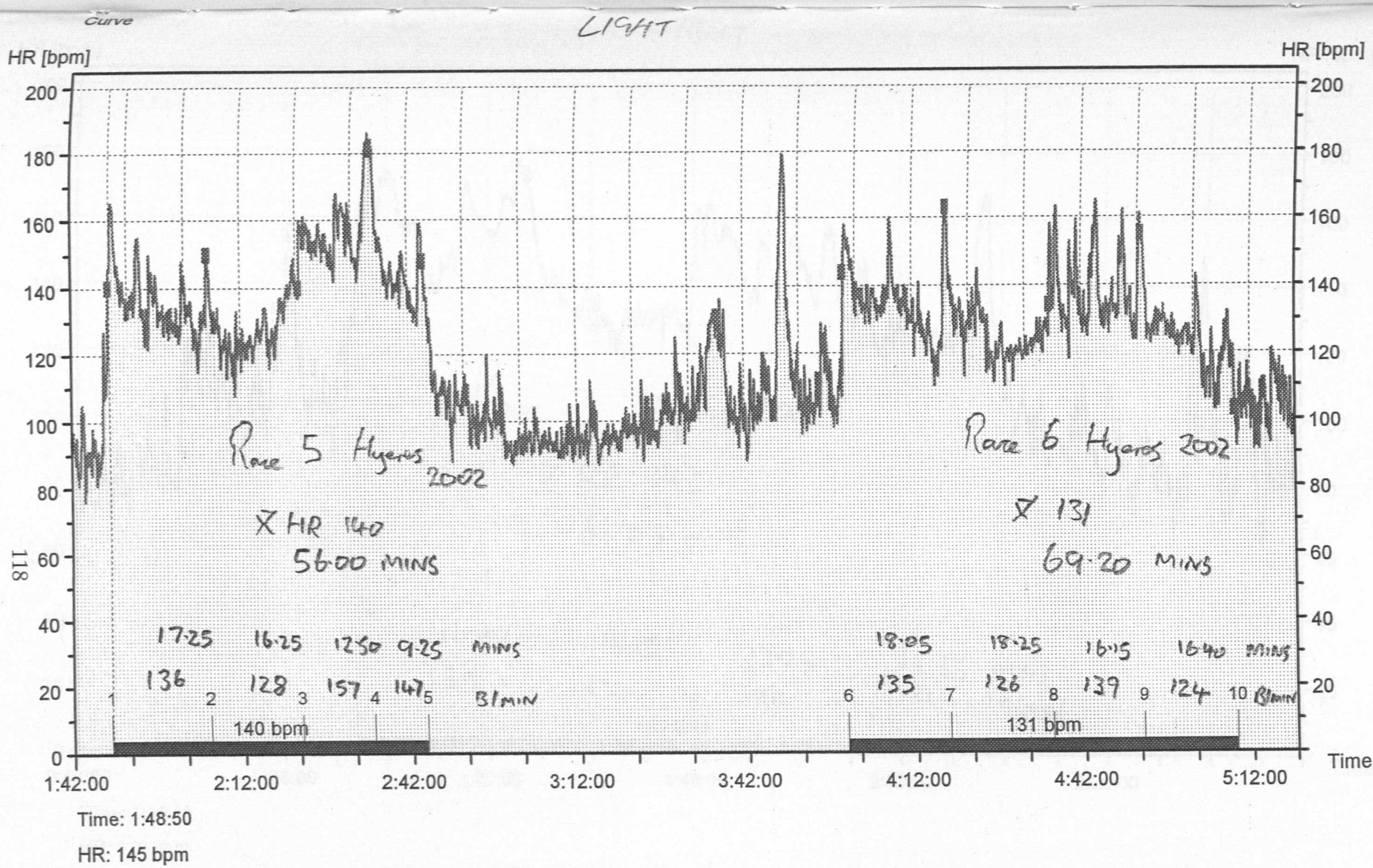
Person	SUBJECT 11	Date	25/04/2002	Heart rate avera	108 bpm		
Exercise	25/04/2002 10:28	Time	10:28:00	Heart rate max	162 bpm		
Sport	Sailing	Duration	5:46:00.0				
Note	Hyeres day 5 races 9 & 10 (gold). 6-12 knots - dropped of	Selection		1:48:30 - 4:32:55 (1:46:15.0)			



Time: 1:56:50

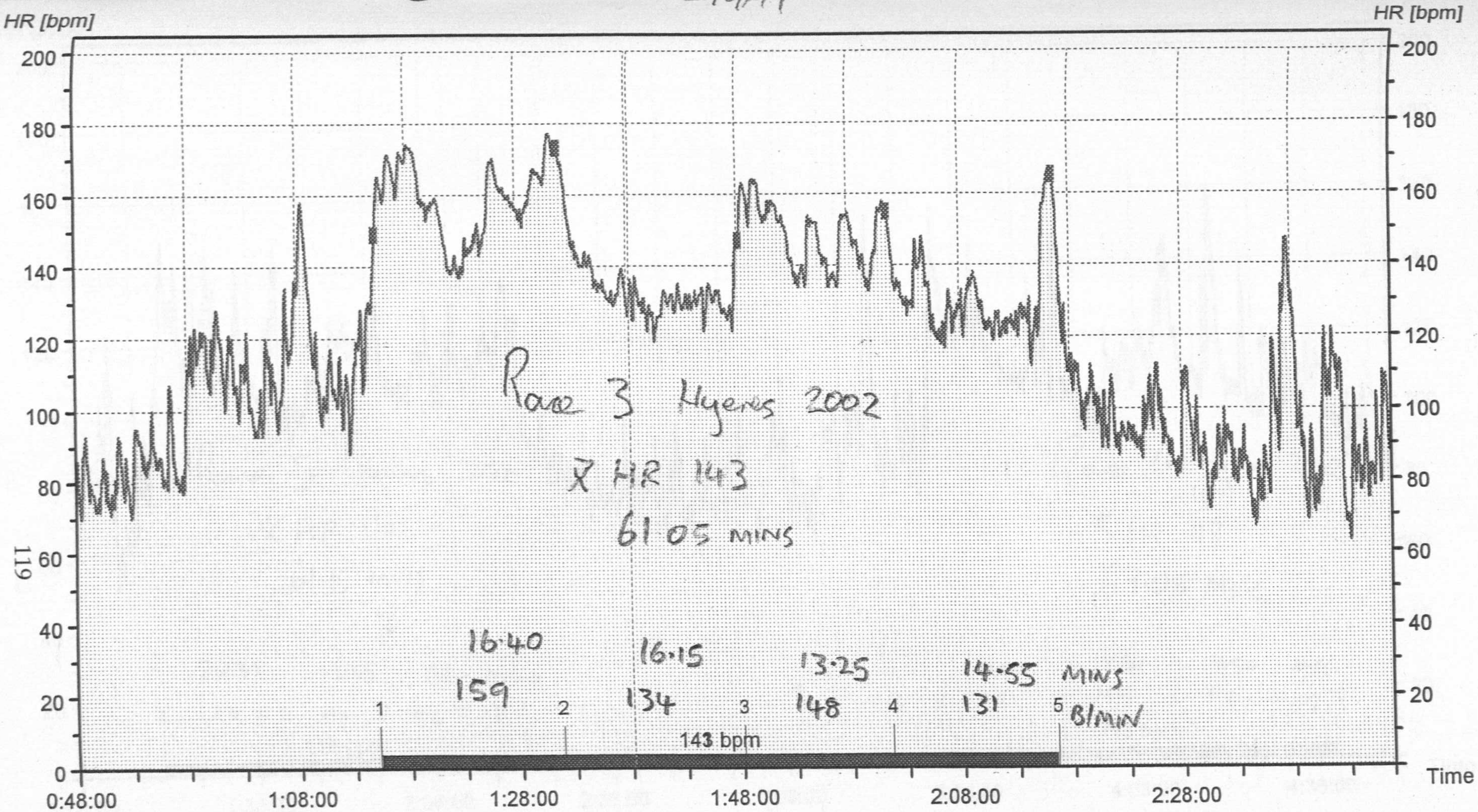
HR: 156 bpm

Person	SUBJECT 12	Date	22/04/2002	Heart rate avera	162 bpm		
Exercise		Time	12:52:37	Heart rate max	203 bpm		
Sport	Sailing	Duration	5:21:10.0				
Note	Laser Hyeres Races 3 6-7 Knots, Outer loop			Selection	1:33:15 - 4:20:10 (1:58:00.0)		



Person	SUBJECT 12	Date	23/04/2002	Heart rate avera	135 bpm		
Exercise	23/04/2002 09:25	Time	09:25:00	Heart rate max	186 bpm		
Sport	Sailing	Duration	6:15:00.0				
Note	Hyres R 5 & 6. 2-8 knots (R6 2-4 knots)			Selection	1:48:40 - 5:09:15 (2:05:30.0)		

SUBJECT 13 LIGHT



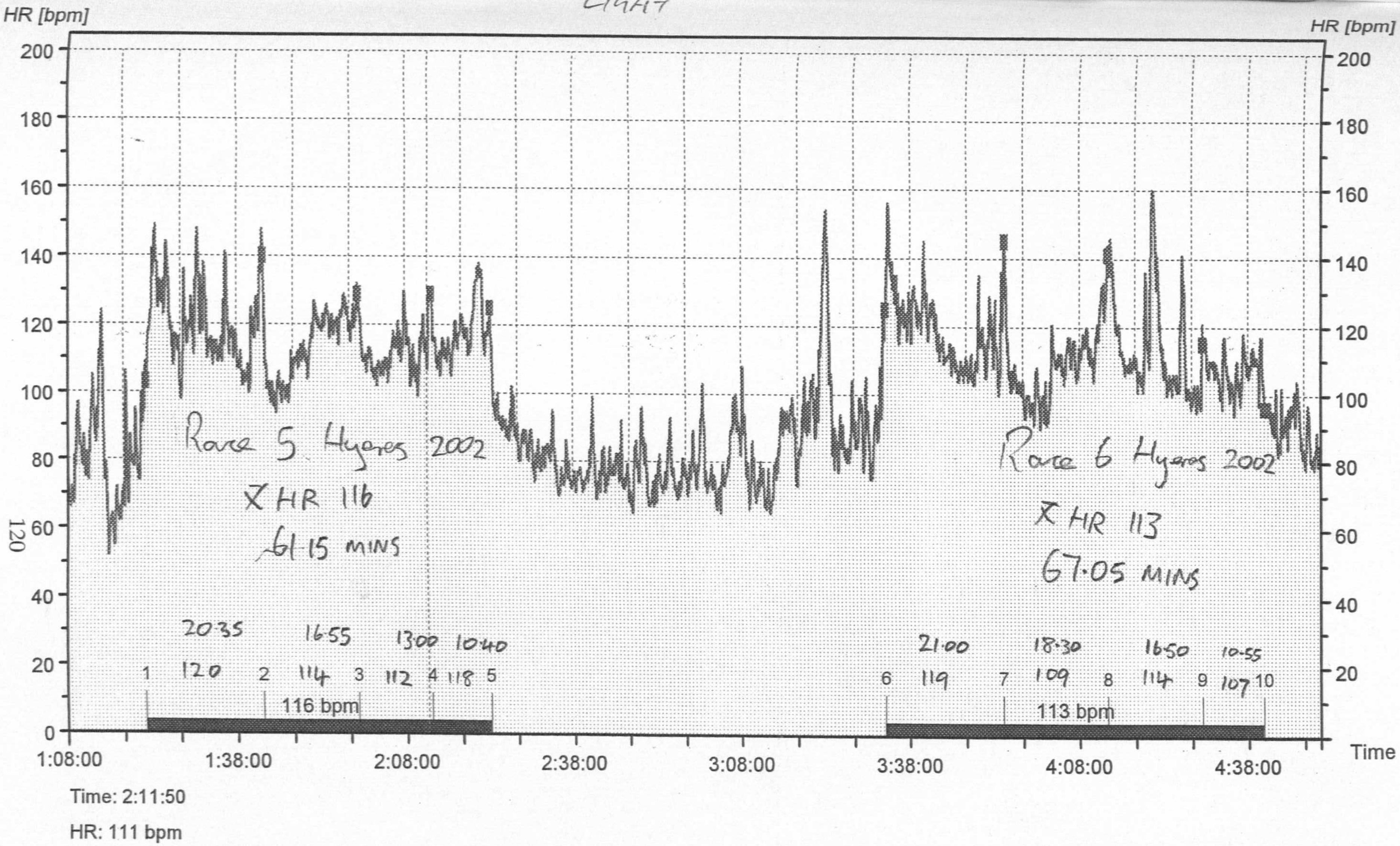
119

Time: 1:38:15

HR: 129 bpm

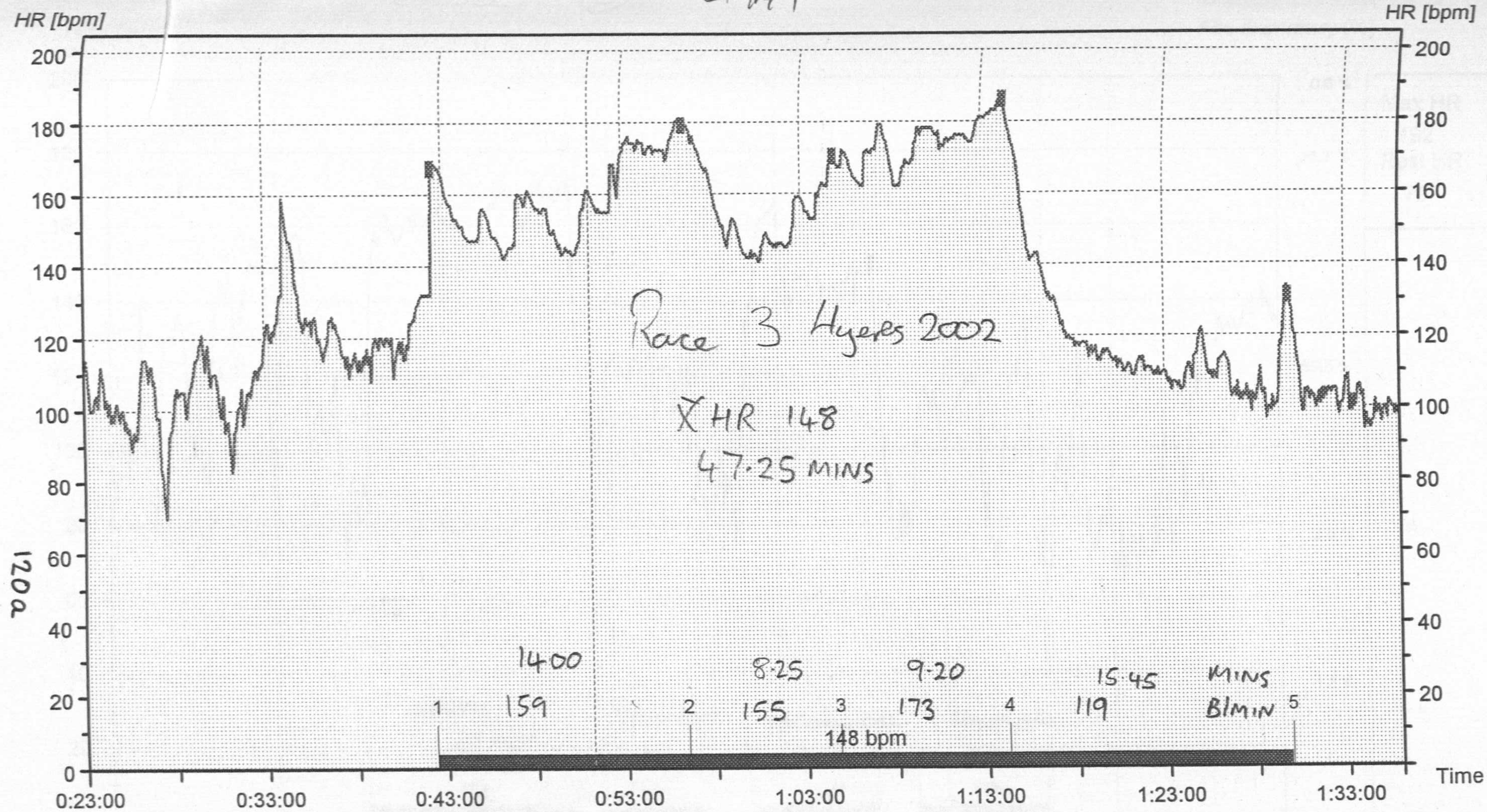
Person	SUBJECT 13	Date	22/04/2002	Heart rate avera	142 bpm		
Exercise		Time	12:52:39	Heart rate max	177 bpm		
Sport		Duration	5:16:55.0				
Note	Laser Hyeres Races 3 (6-7 Knots) Outer loop			Selection	1:15:20 - 4:22:20 (1:58:00.0)		

LIGHT



Person	SUBJECT 14	Date	23/04/2002	Heart rate avera	115 bpm
Exercise	23/04/2002 10:50	Time	10:50:32	Heart rate max	160 bpm
Sport		Duration	5:54:40.0		
Note	Hyeres R 5 & 6. 2-8 knots (R6 2-4 knots)			Selection	1:22:00 - 4:40:50 (2:08:15.0)

LIGHT

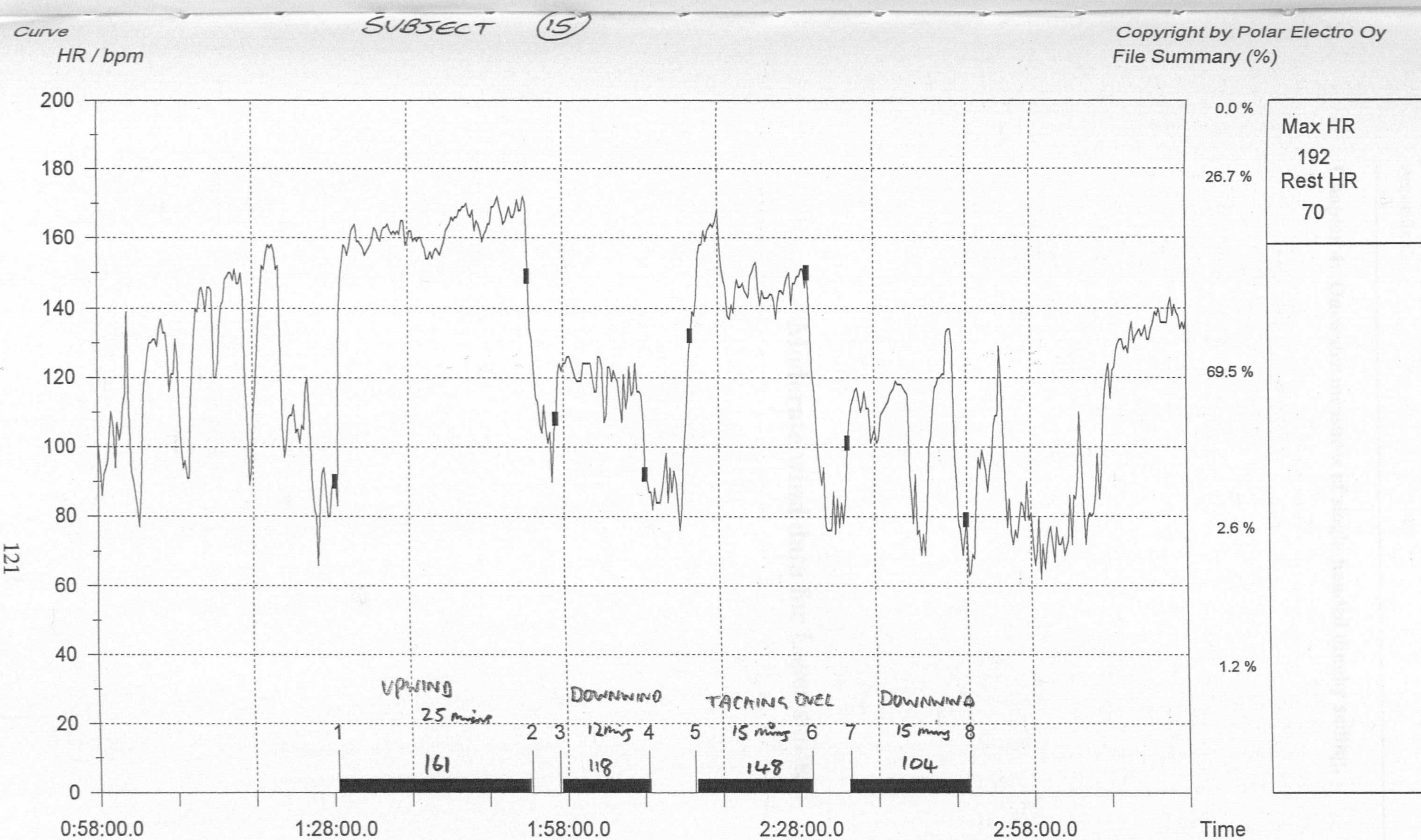


120a

Time: 0:51:10

HR: 161 bpm

Person	SUBJECT 14	Date	22/04/2002	Heart rate avera	148 bpm		
Exercise	22/04/2002 12:29	Time	13:16:47	Heart rate max	186 bpm		
Sport		Duration	2:55:10.0				
Note	Hyeres, Race 3 (6-7 knots) Outer loop			Selection	0:42:25 - 1:29:50 (0:47:25.0)		



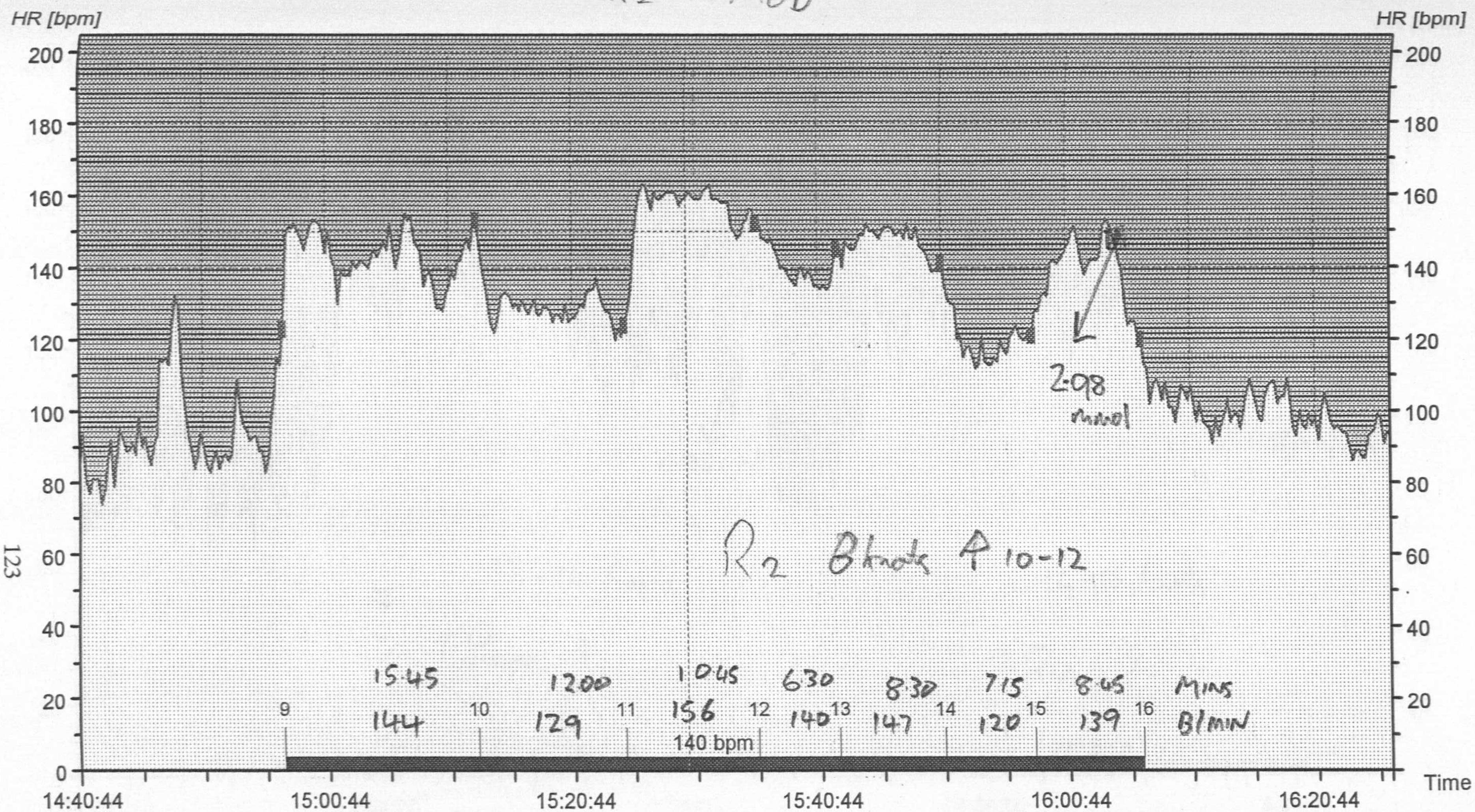
HR: 79 bpm
Time: 2:49:45.0

Person	SUBJECT 15	Date	23/07/1998	Average	137 bpm	Recovery	-80 bpm
Exercise		Time	12:35:28.0	Duration of exercise: 4:10:38.8			
Note	Laser with Finn on 23.7.98 at Hayling Island			Selected period: 1:28:30.0 - 2:49:45.0 (1:06:30.0)			

Chapter 4: On-water measures of single-handed dinghy sailing.

Moderate wind data for Laser sailing.

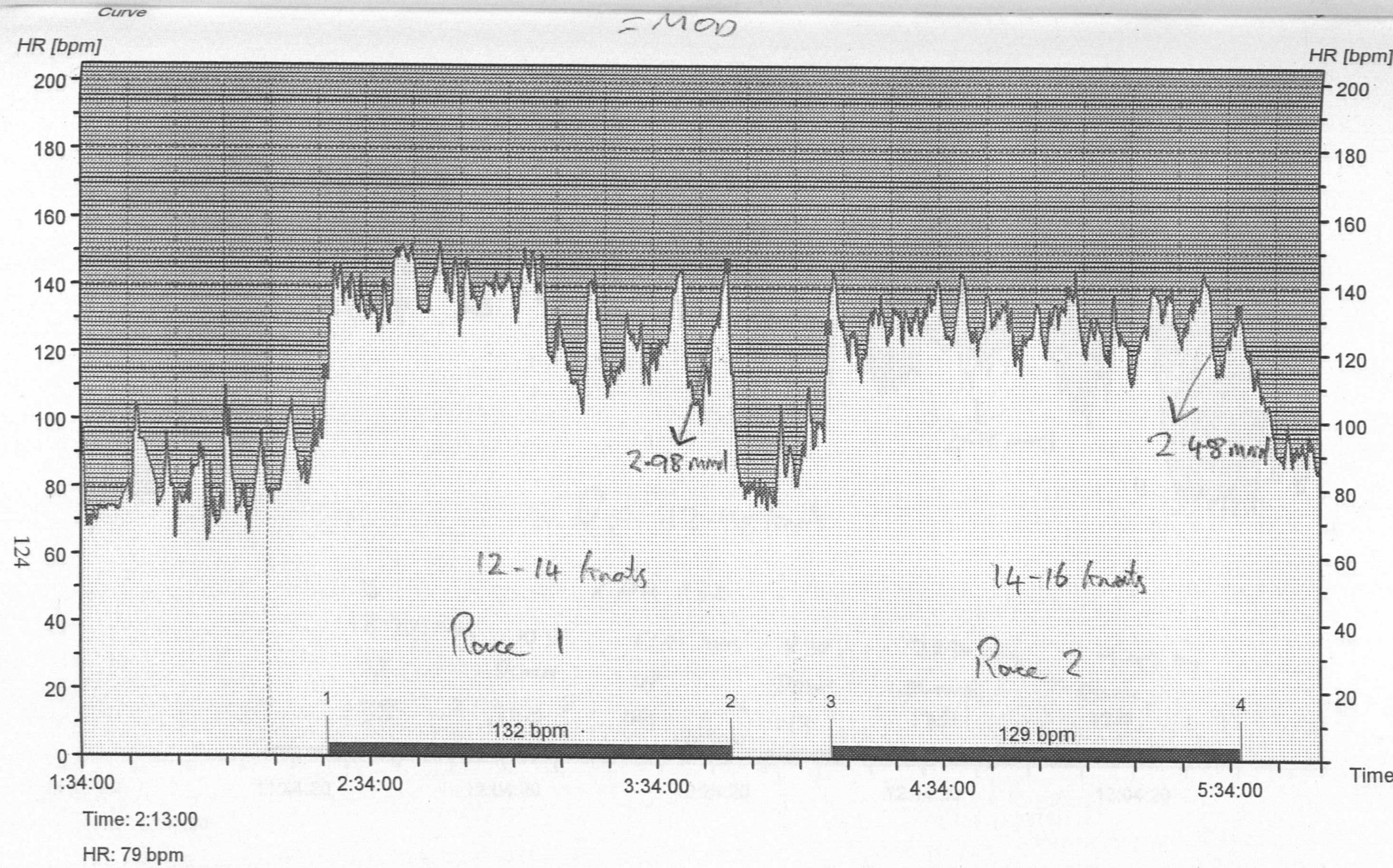
Curve SUBJECT ① R₂ = MOD



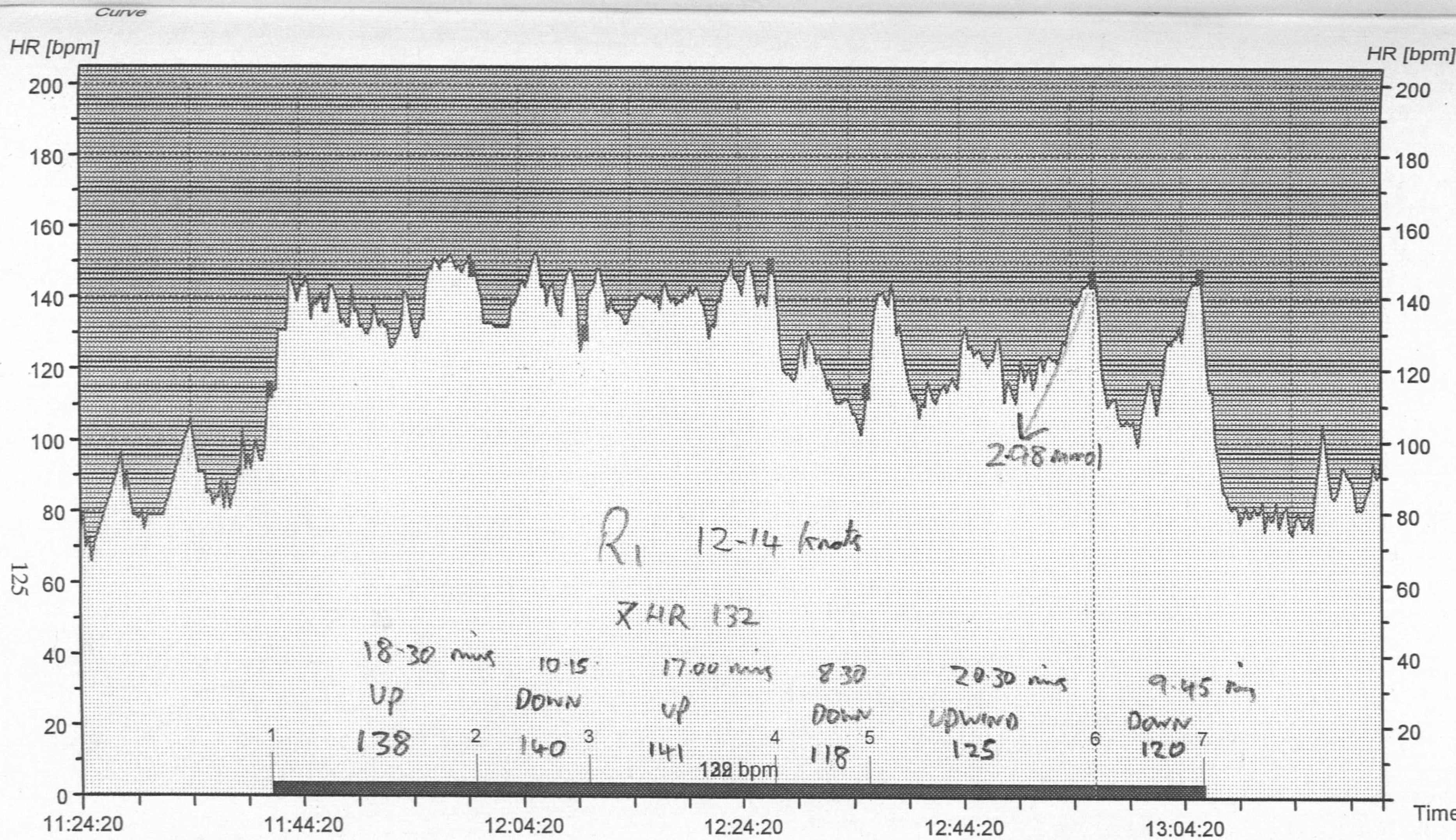
Time: 15:29:59

HR: 159 bpm

Person	SUBJECT ①	Date	16/06/1994	Heart rate avera	140 bpm	Limits 1	150 - 200
Exercise	16-6	Time	09:25:44	Heart rate max	163 bpm	Limits 2	150 - 200
Sport		Duration	7:37:15.0				
Note	Laser Eurolymp 16.6.94. Upwind finish , R2 6-7 knots			Selection	14:57:14 - 16:06:44 (1:09:30.0)		



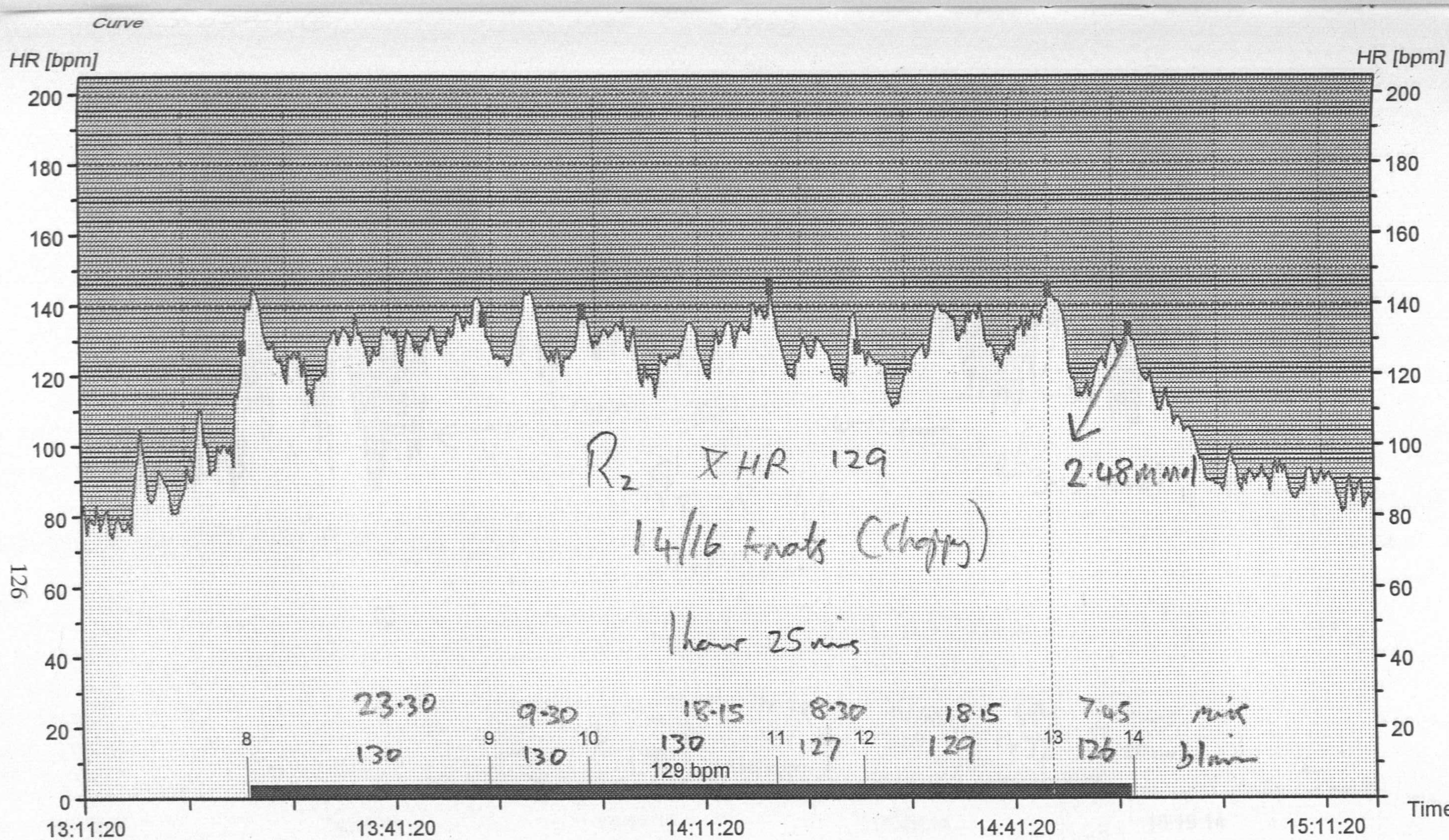
Person	SUBJECT 1	Date	18/06/1994	Heart rate avera	130 bpm	Limits 1	150 - 200
Exercise	18-6	Time	09:16:20	Heart rate max	153 bpm	Limits 2	150 - 200
Sport		Duration	6:42:30.0				
Note	Hayling Europeans, 12-16 knots, very choppy			Selection	2:25:30 - 5:36:15 (2:49:45.0)		



Time: 12:56:20

HR: 145 bpm

Person	SUBJECT 1	Date	18/06/1994	Heart rate avera	130 bpm	Limits 1	150 - 200
Exercise	18-6	Time	09:16:20	Heart rate max	153 bpm	Limits 2	150 - 200
Sport		Duration	6:42:30.0				
Note	Havling Europeans. 12-16 knots. very choppy			Selection	11:41:35 - 14:52:35 (2:50:00.0)		

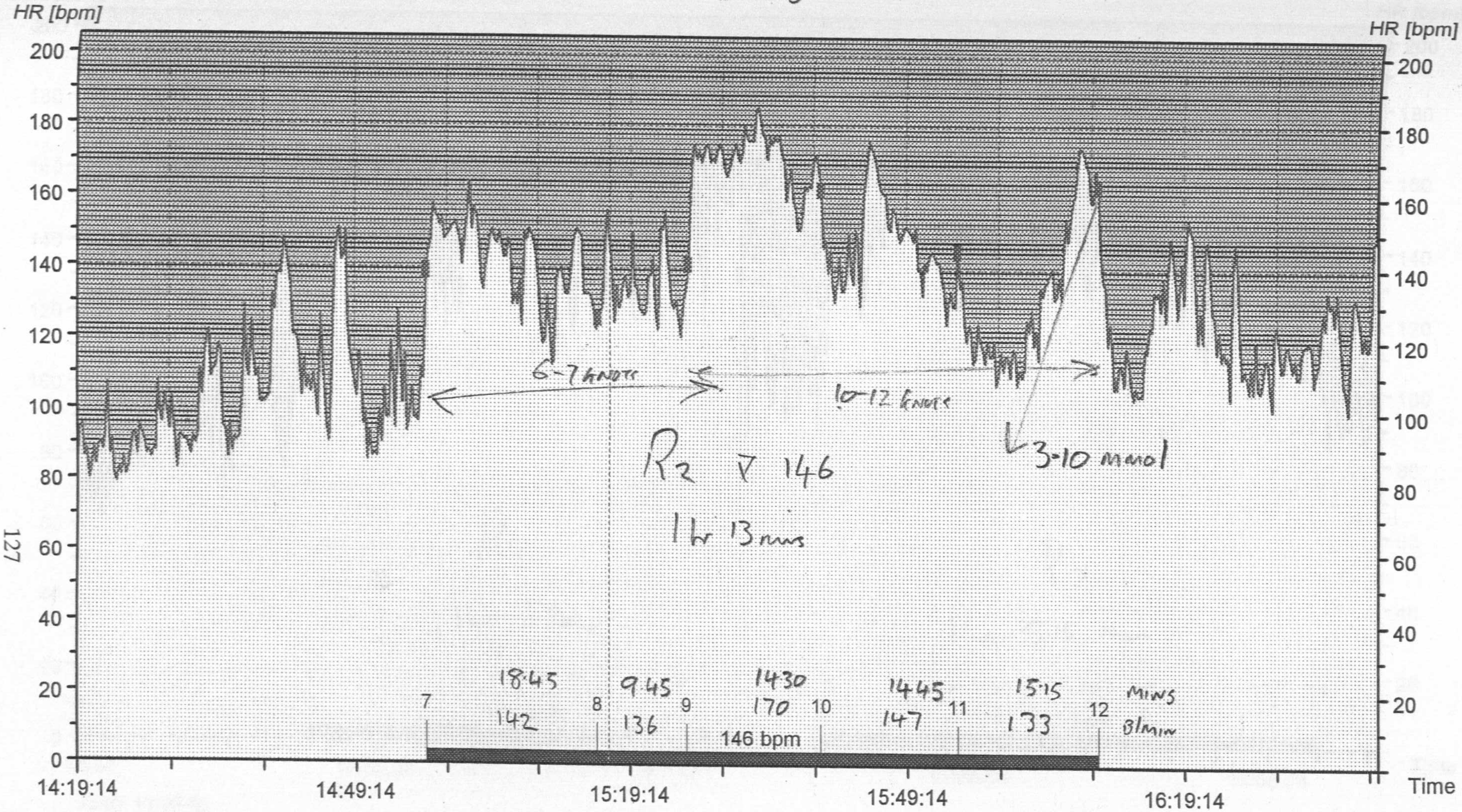


Time: 14:45:05

HR: 144 bpm

Person	SUBJECT 1	Date	18/06/1994	Heart rate avera	129 bpm	Limits 1	150 - 200
Exercise	18-6	Time	09:16:20	Heart rate max	145 bpm	Limits 2	150 - 200
Sport		Duration	6:42:30.0				
Note	Hayling Europeans 12-16 knots very choppy			Selection	13:27:20 14:52:35 (1:25:15.0)		

Curve SUBJECT (2) = MOD

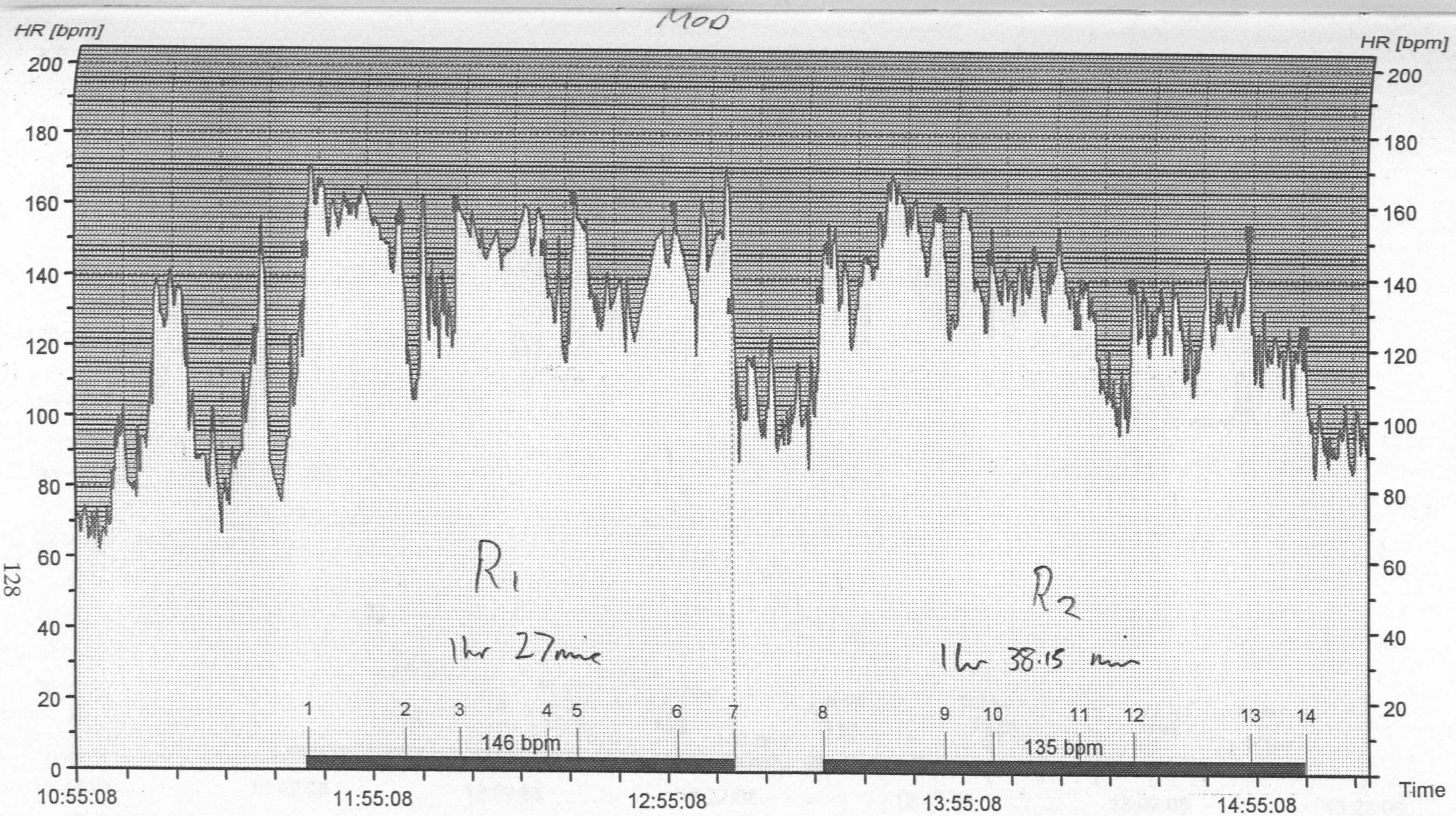


Time: 15:16:59

HR: 147 bpm

Person	SUBJECT (2)	Date	16/06/1994	Heart rate avera	142 bpm
Exercise	16-6	Time	09:22:14	Heart rate max	185 bpm
Sport		Duration	7:42:30.0		
Note	Havling Europeans. 16/6/94. 6/7 knots increase 10-12			Selection	12:29:59 - 16:09:59 (2:39:45.0)

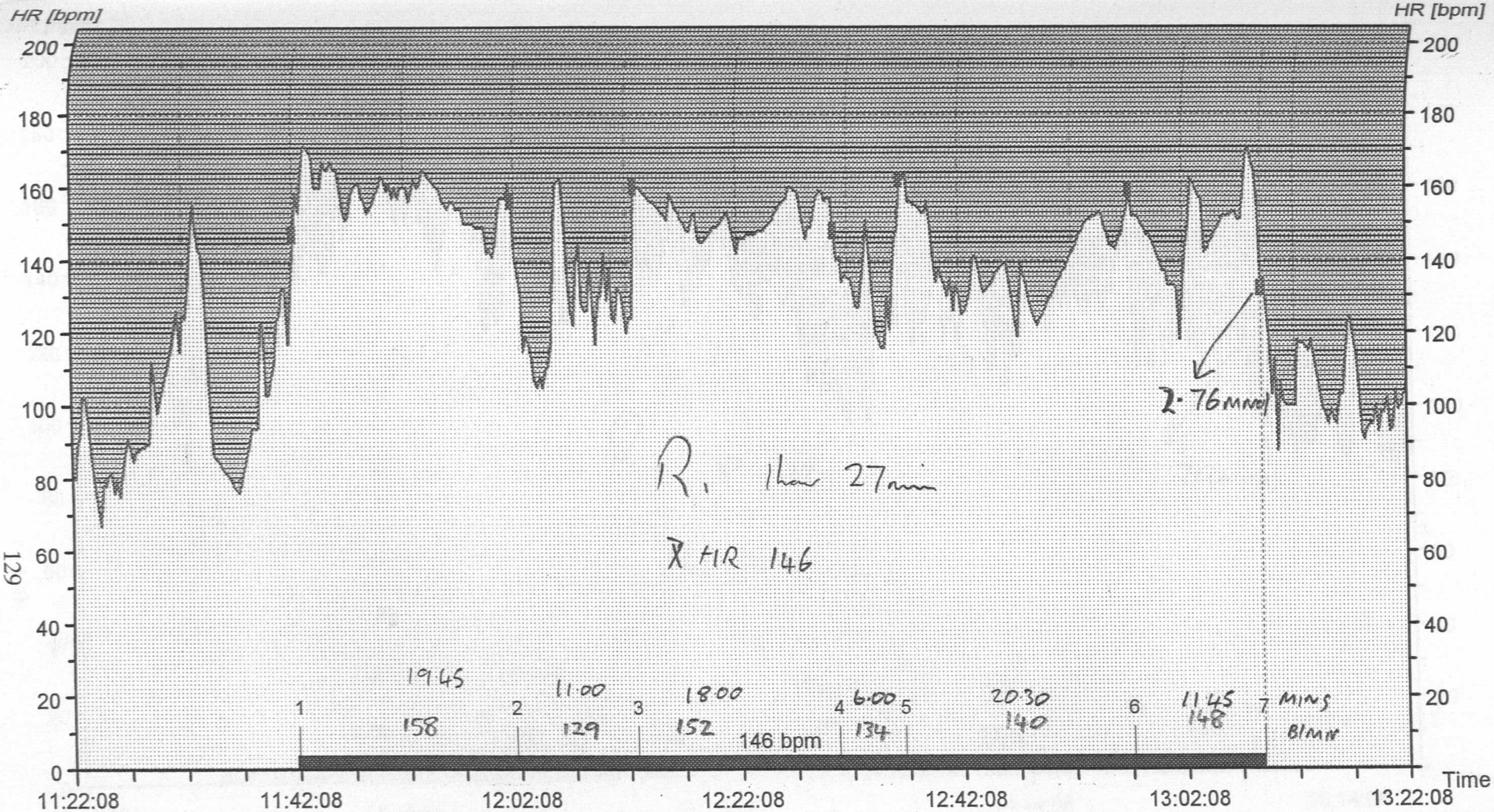
Mod



Time: 13:09:08

HR: 132 bpm

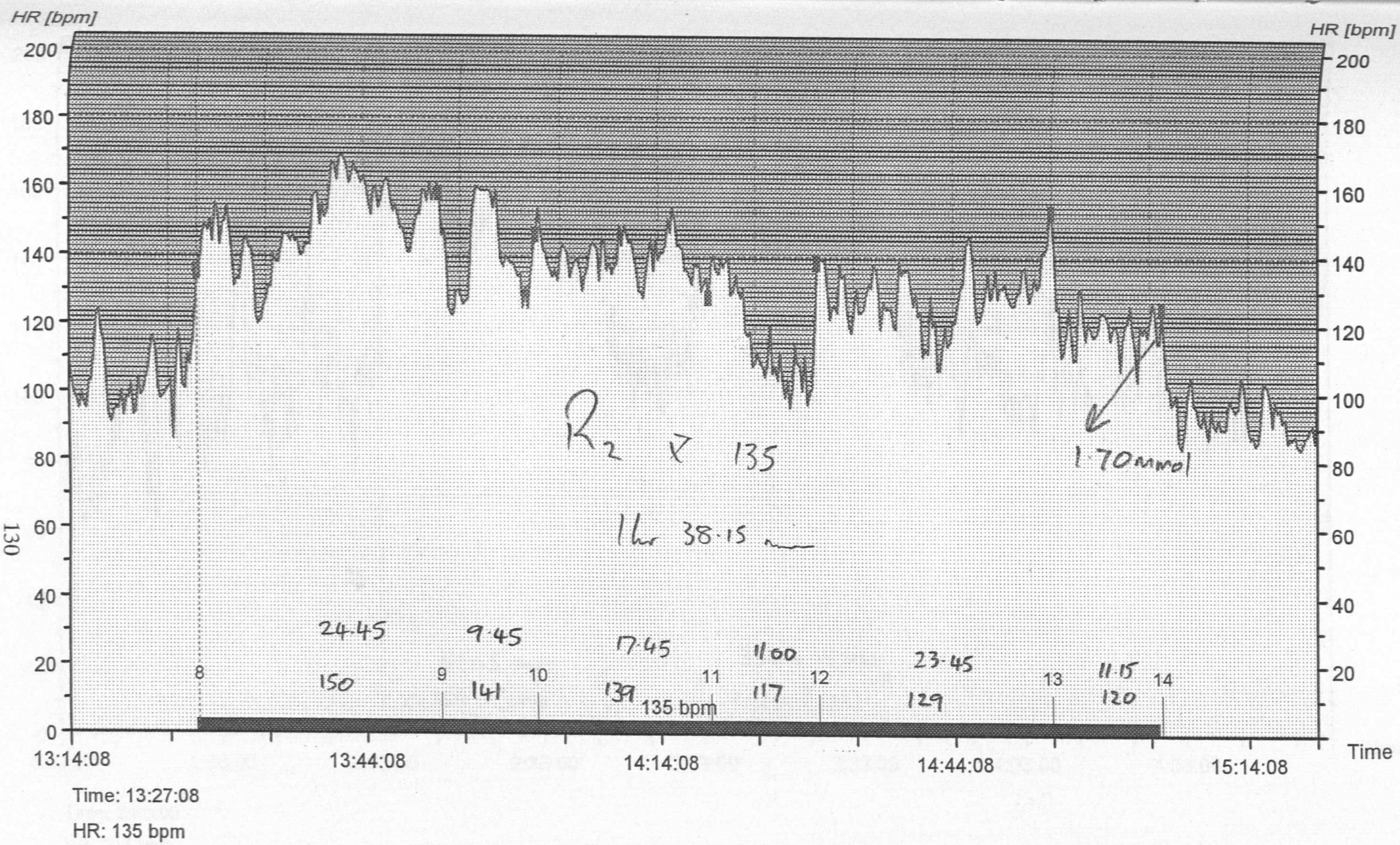
Person	SUBJECT 2	Date	18/06/1994	Heart rate avera	140 bpm		
Exercise	18-6	Time	09:19:08	Heart rate max	171 bpm		
Sport		Duration	6:31:30.0				
Note	Hayling Europeans, 18/6/94. 14-16 knots			Selection	11:41:38 - 15:05:08 (3:05:45.0)		



Time: 13:09:08

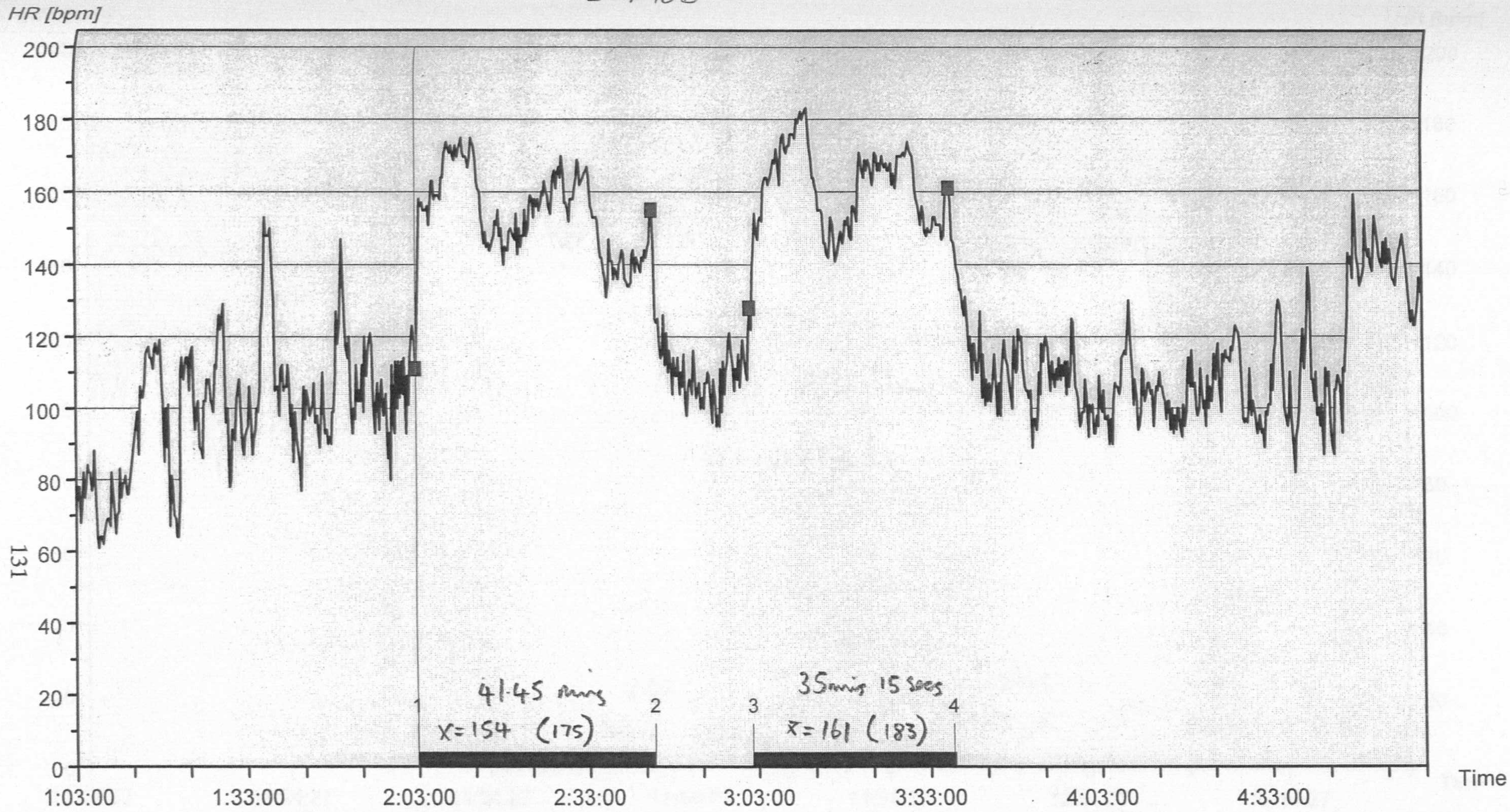
HR: 132 bpm

Person	SUB 2	Date	18/06/1994	Heart rate avera	146 bpm		
Exercise	18-6	Time	09:19:08	Heart rate max	171 bpm		
Sport		Duration	6:31:30.0				
Note	Hayling Europeans, 18/6/94. 12-14 knots			Selection	11:41:53 - 13:09:08 (1:27:15.0)		



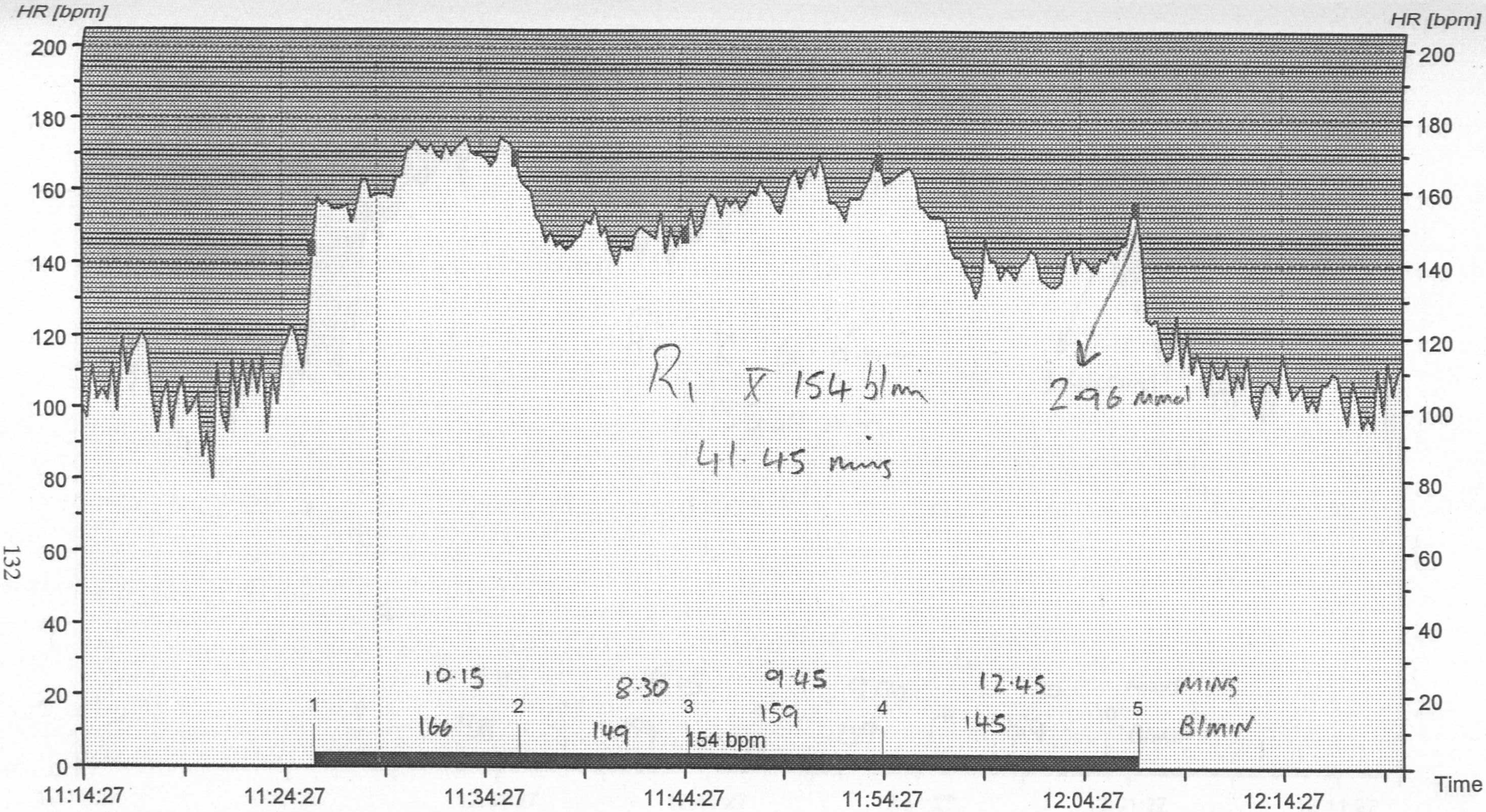
Person	SUBJECT 2	Date	18/06/1994	Heart rate avera	135 bpm		
Exercise	18-6	Time	09:19:08	Heart rate max	169 bpm		
Sport		Duration	6:31:30.0				
Note	Hayling Europeans, 18/6/94. 14-16 knots			Selection	13:26:53 - 15:05:08 (1:38:15.0)		

Curve SUBJECT (3) = Moo



Time: 2:03:00
HR: 111 bpm

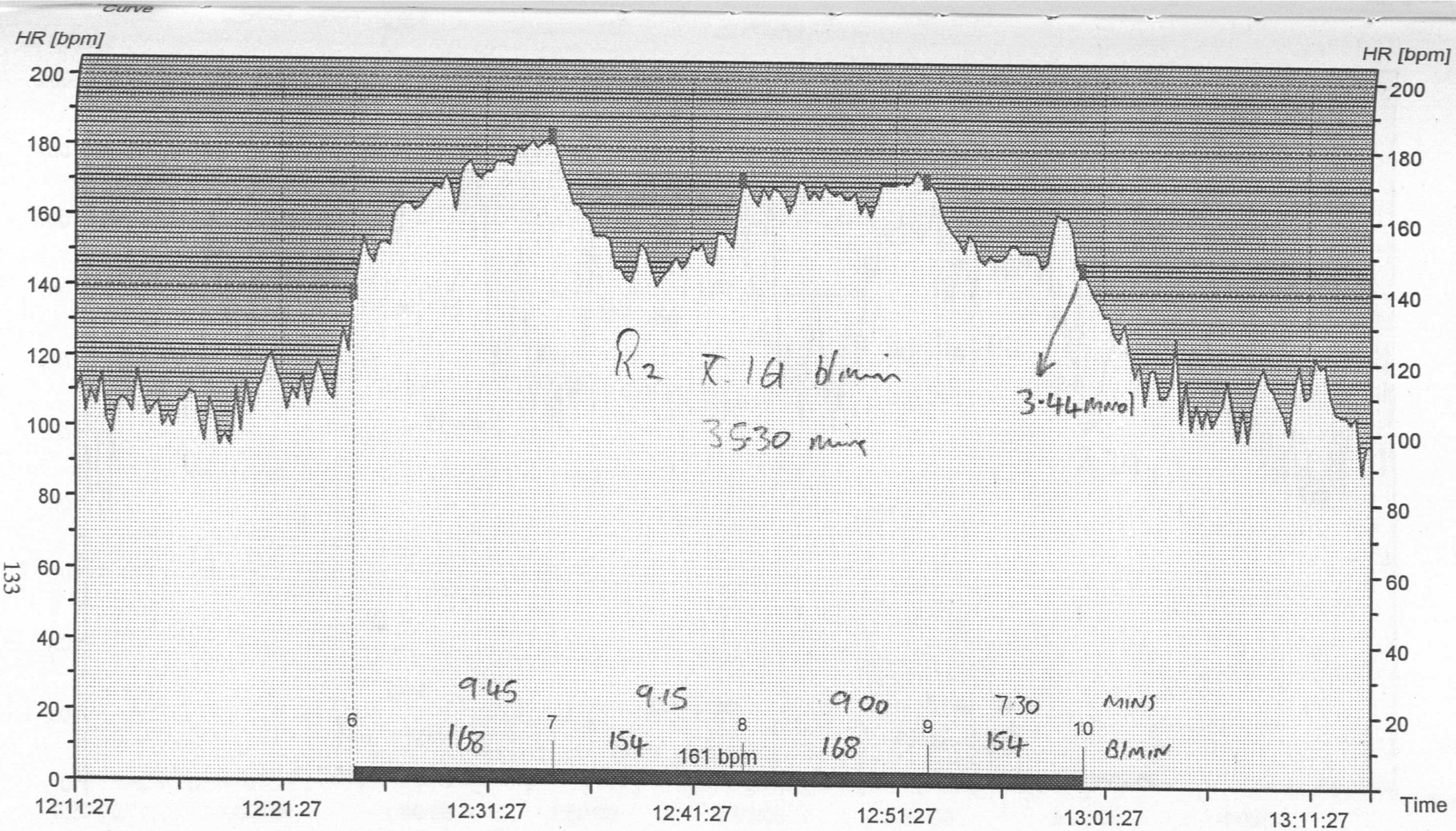
Person	SUBJECT (3)	Date	19/02/1994	Heart rate	156 / 183	Limits 1	155 - 185
Exercise		Time	09:22:27	Max. HR	0	Limits 2	155 - 180
Sport		Duration	7:05:30.0	Distance		Thresholds	155 - 185
Note	19/02/94			Selection	2:02:30 - 3:37:30 (1:17:15.0)		



Time: 11:29:12

HR: 159 bpm

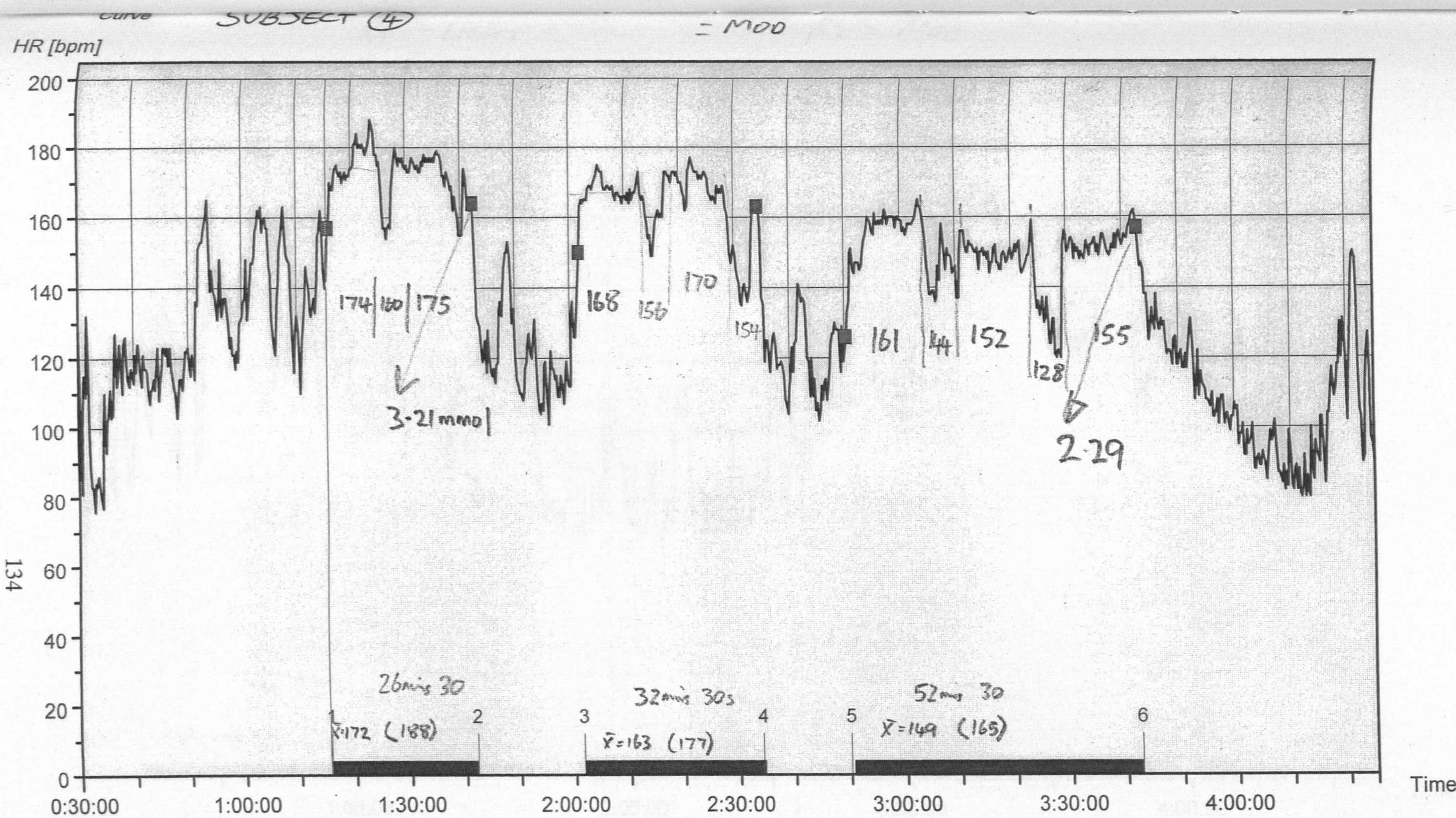
Person	SUBJECT 3	Date	19/02/1994	Heart rate avera	154 bpm		
Exercise	19-2	Time	09:22:27	Heart rate max	175 bpm		
Sport		Duration	7:05:30.0				
Note	19/2/94. Hayling (cold), 10-12 knots			Selection	11:25:57 - 12:07:12 (0:41:15.0)		



Time: 12:24:57

HR: 138 bpm

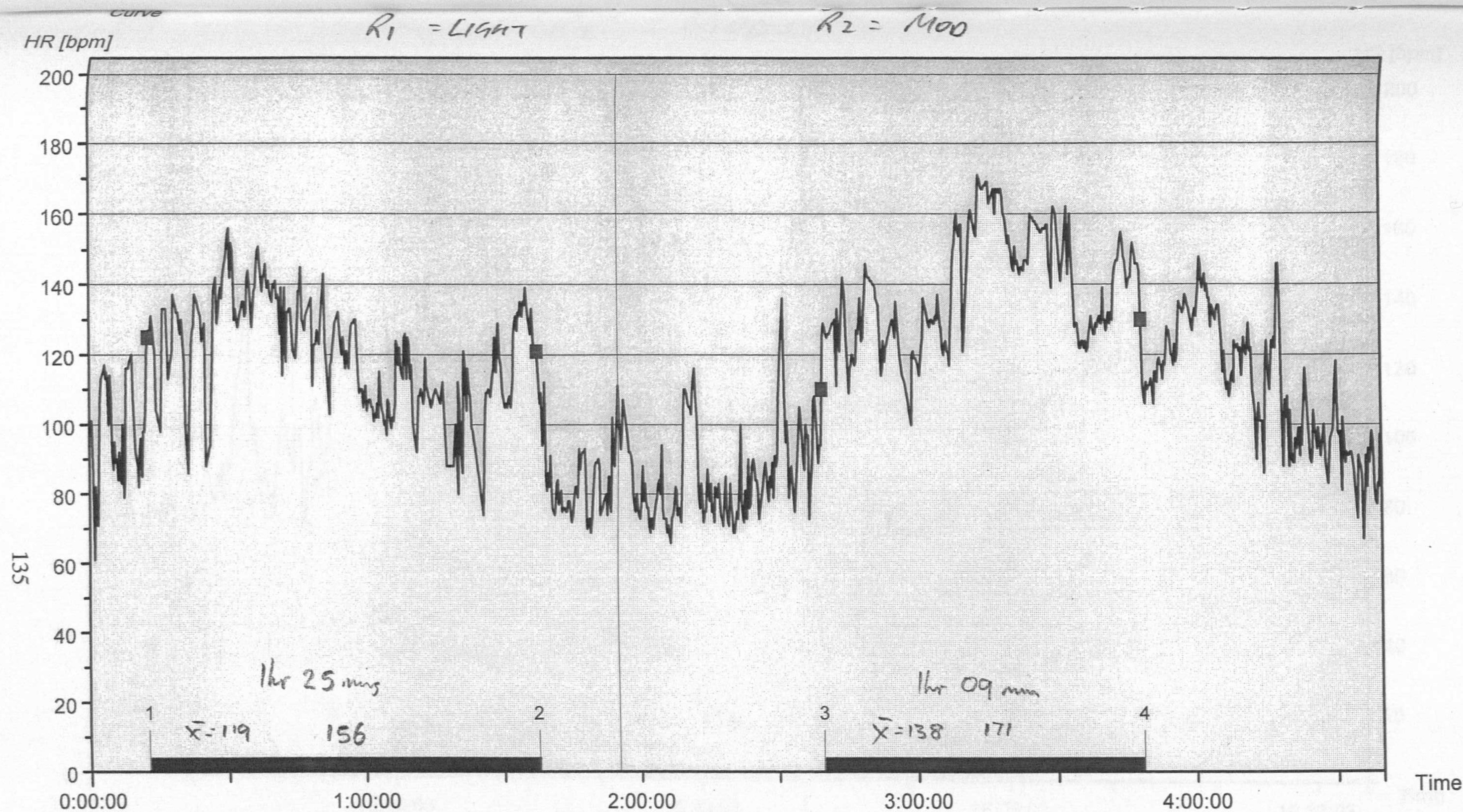
Person	SUBJECT 3	Date	19/02/1994	Heart rate avera	161 bpm		
Exercise	19-2	Time	09:22:27	Heart rate max	183 bpm		
Sport		Duration	7:05:30.0				
Note	19/2/94. Hayling (cold), 10-12 knots			Selection	12:24:57 - 13:00:27 (0:35:30.0)		



Time: 1:15:30

HR: 146 bpm

Person	SUBJECT 4	Date	19/02/1994	Heart rate	159 / 188	Limits 1	50 - 200
Exercise		Time	11:08:30	Max. HR	0	Limits 2	50 - 200
Sport		Duration	4:56:00.0	Distance		Thresholds	50 - 200
Note	19/2/94. windward/leeward/windward 10-12 knots			Selection	1:15:45 - 3:42:45 (1:51:30.0)		

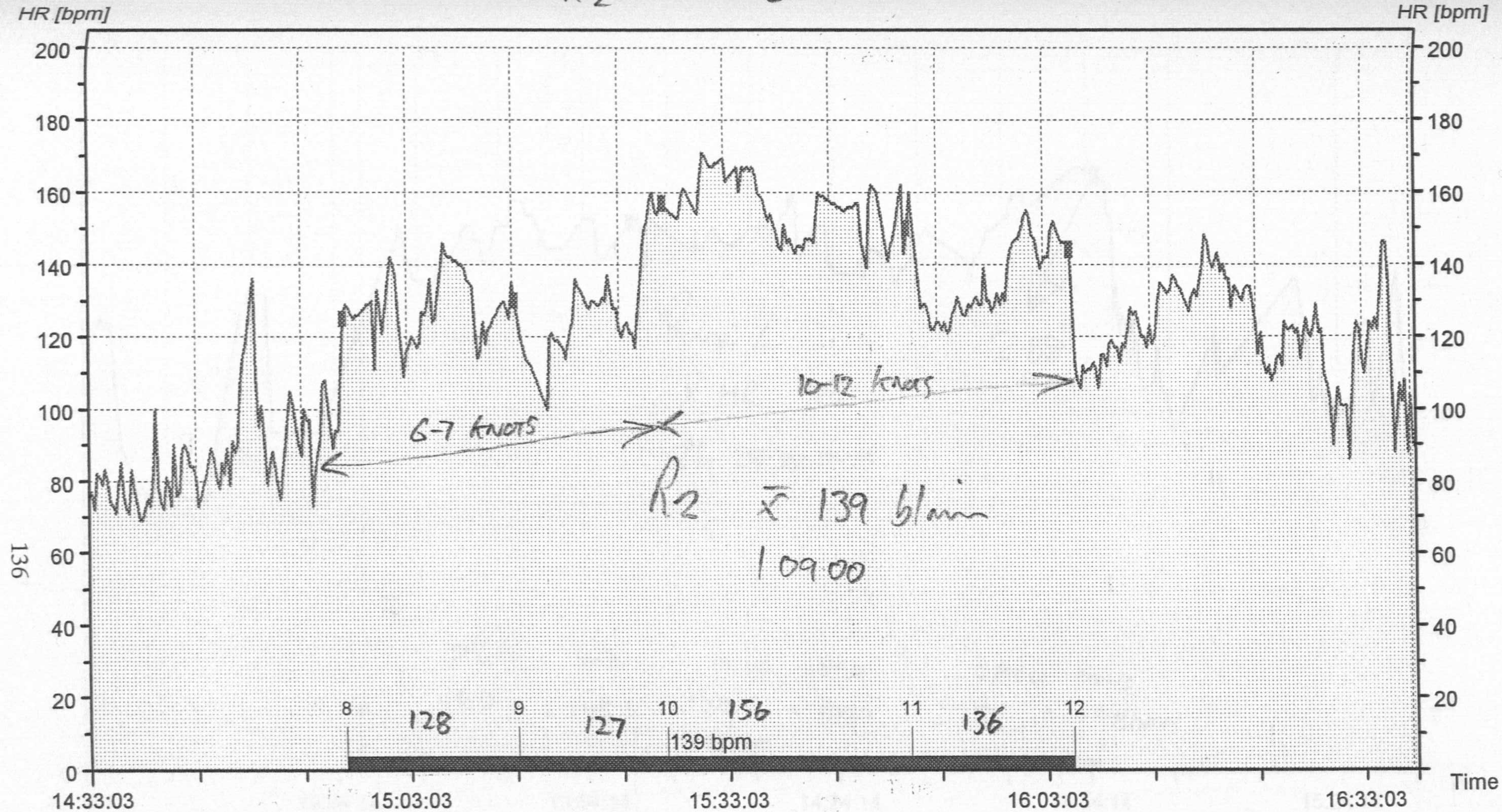


Time: 1:55:15

HR: 111 bpm

Person	SUBJECT 4	Date	16/06/1994	Heart rate	127 / 171	Limits 1	150 - 200
Exercise		Time	12:17:03	Max. HR	0	Limits 2	150 - 200
Sport		Duration	4:39:45.0	Distance		Thresholds	150 - 200
Note	Hayling Eurolymp, 16/6/94. R1 6-7 knots, R2 6-7 knots increased			Selection	0:13:00 - 3:48:45 (2:33:45.0)		

R_2 = MOD

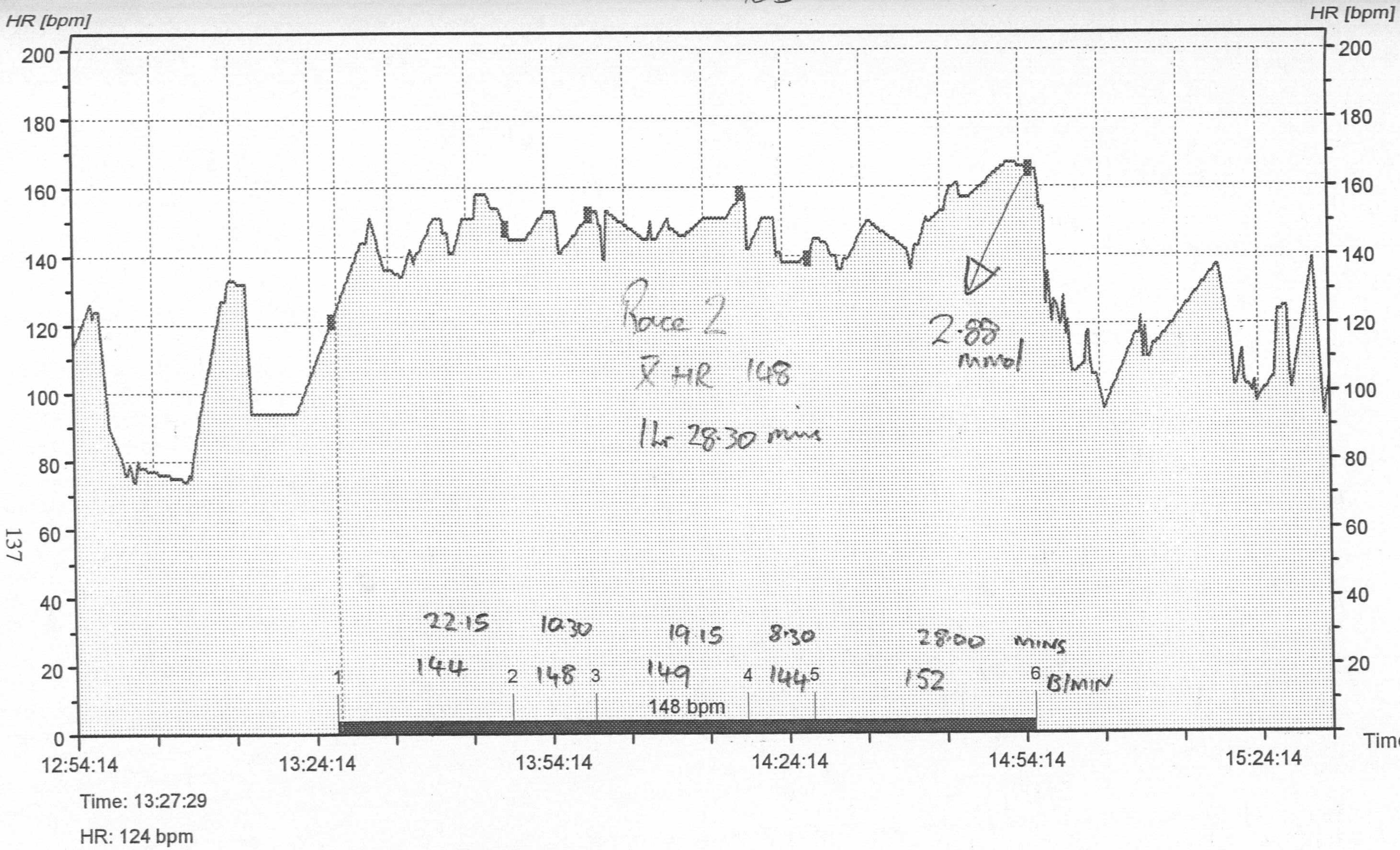


Time: 16:37:33

HR: 104 bpm

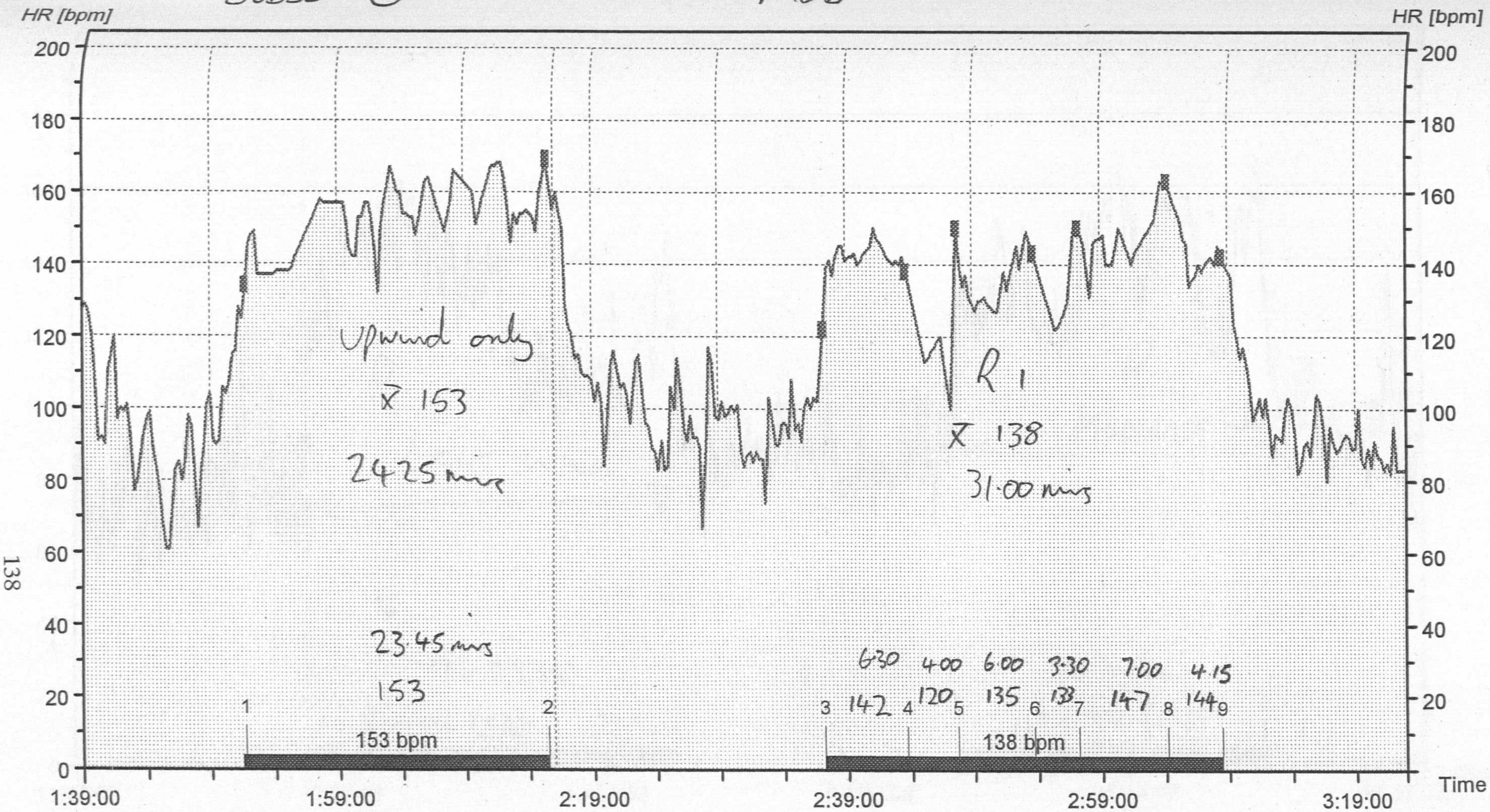
Person	SUBJECT 4	Date	16/06/1994	Heart rate avera	139 bpm		
Exercise	16-6	Time	12:17:03	Heart rate max	171 bpm		
Sport		Duration	4:39:45.0				
Note	Hayling Europeans, 16/6/94. R2 6-7 knots increase 10-12			Selection	14:57:03 - 16:05:33 (1:08:30.0)		

= MOD



Person	SUBJECT 4	Date	18/06/1994	Heart rate avera	148 bpm		
Exercise	18-6	Time	09:38:14	Heart rate max	167 bpm		
Sport		Duration	6:19:30.0				
Note	Hayling Europeans, 18/6/94. 14-16 knots			Selection	13:26:59 - 14:55:29 (1:28:30.0)		

SUBJECT 5 MOD

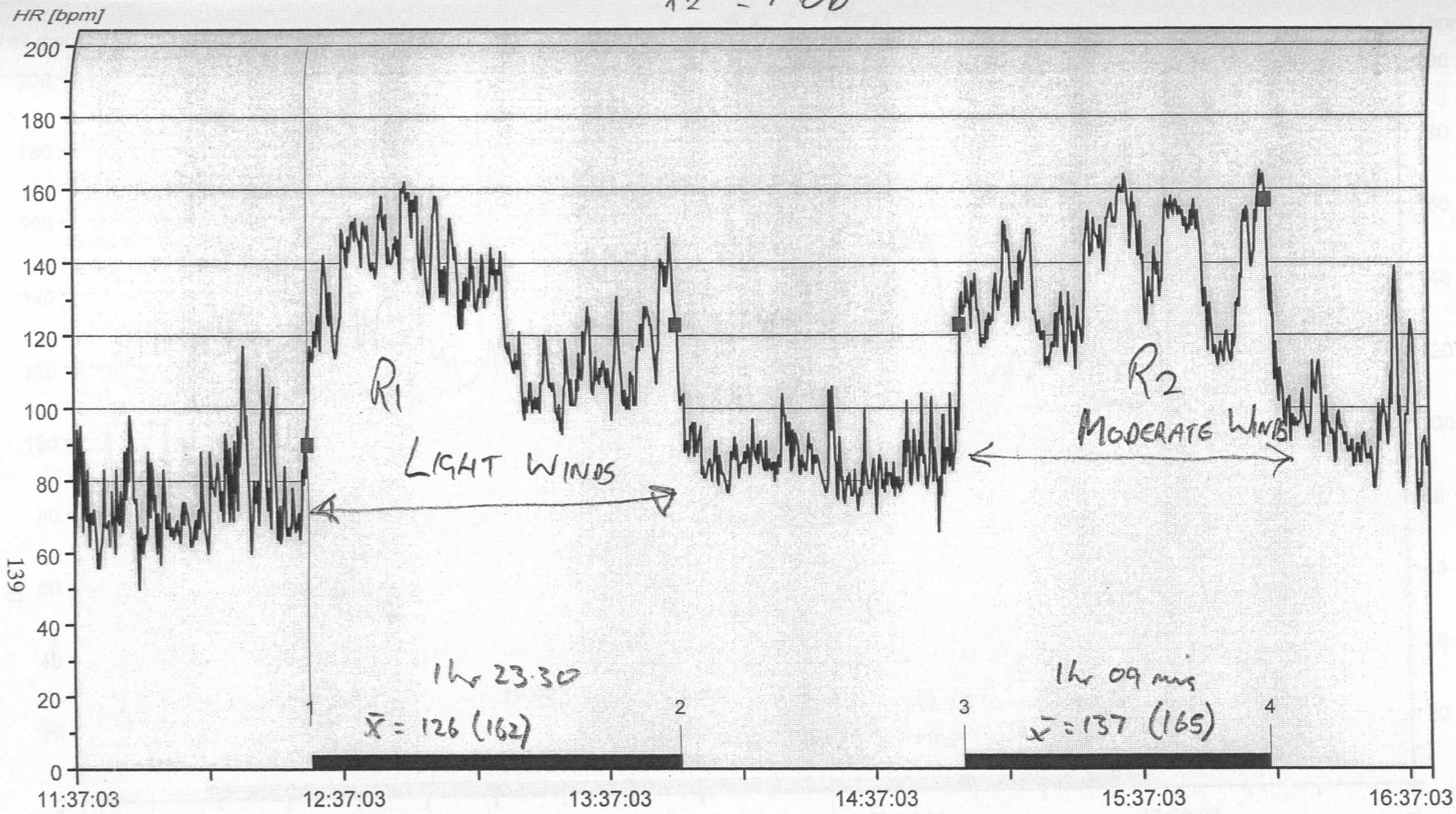


Time: 2:16:00

HR: 155 bpm

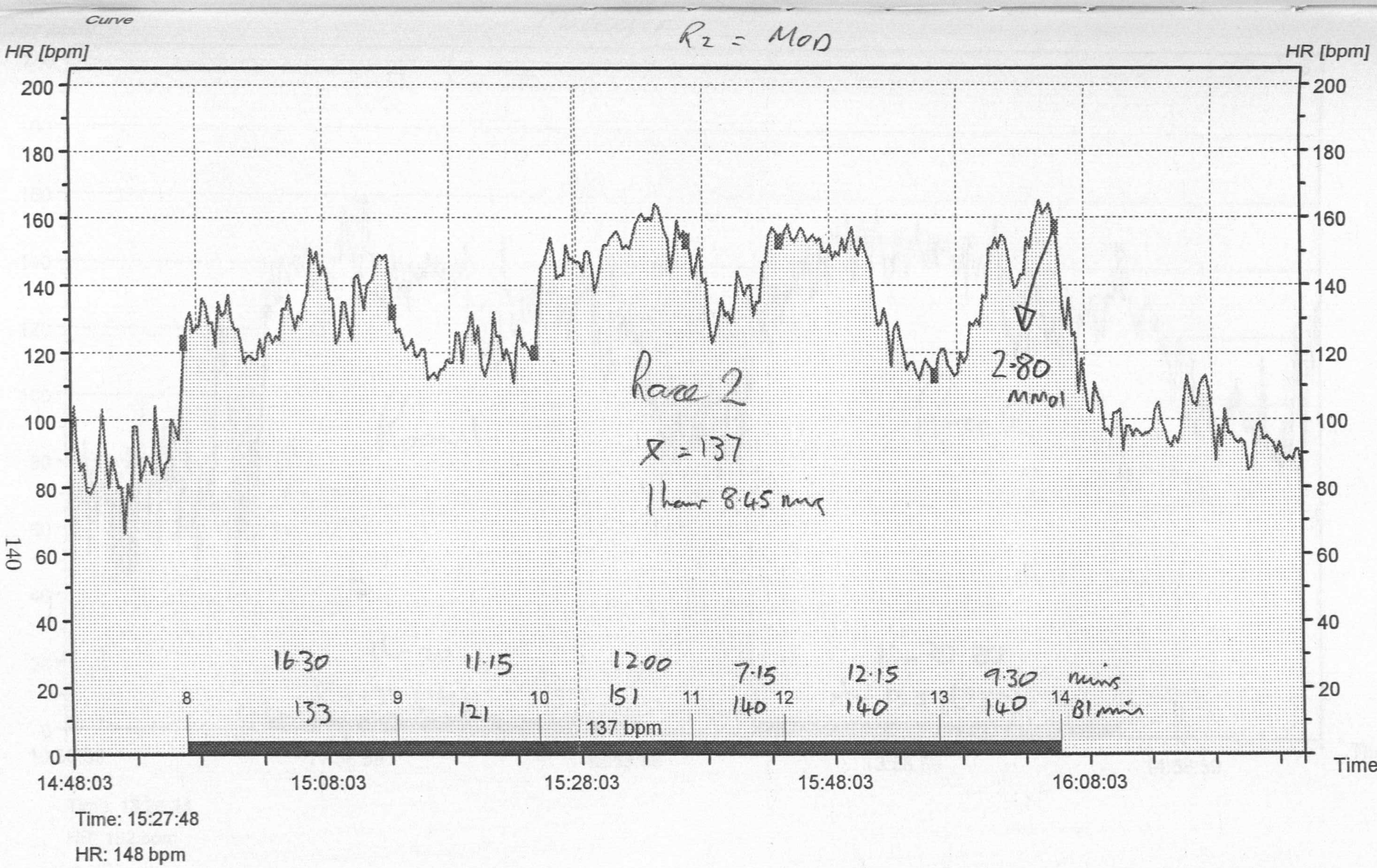
Person	SUBJECT 5	Date	19/02/1994	Heart rate avera	145 bpm		
Exercise	18-2	Time	10:32:02	Heart rate max	169 bpm		
Sport		Duration	5:37:15.0				
Note	Hayling	19/2/94. 8-12 knots		Selection	1:51:30 - 3:08:30 (0:55:15.0)		

R_2 = MOD



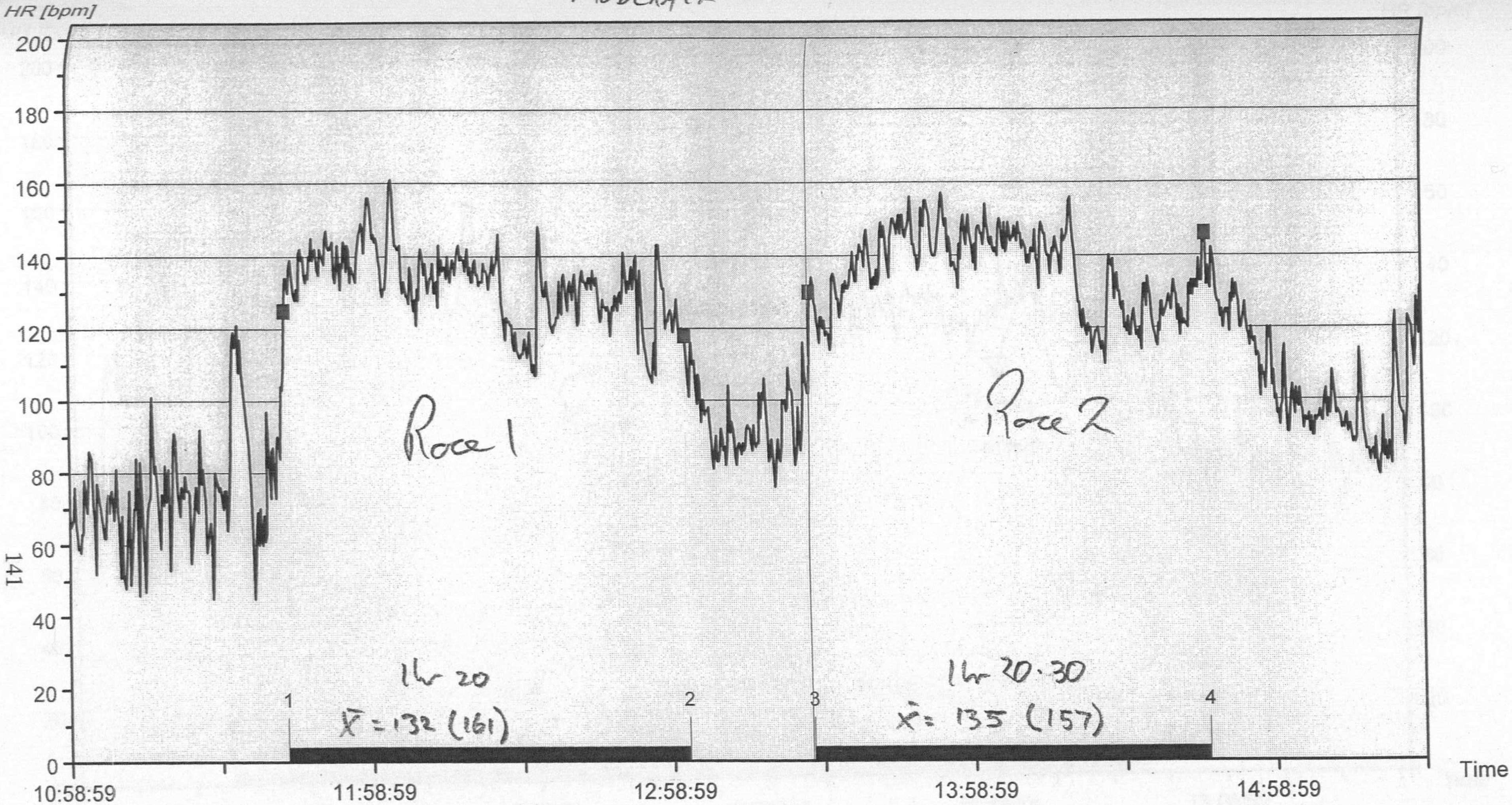
Time: 12:29:48
HR: 90 bpm

Person	SUBJECT (5)	Date	16/06/1994	Heart rate	131 / 165	Limits 1	150 - 200
Exercise		Time	09:25:03	Max HR	0	Limits 2	150 - 200
Sport		Duration	7:39:30.0	Distance		Thresholds	150 - 200
Note	R1 6-7 knots, R2 6-7 knots increased to 12-14 knots.			Selection	03:05:00 - 06:40:45 (2:32:15.0)		



Person	SUBJECT 5	Date	16/06/1994	Heart rate avera	137 bpm		
Exercise	16-6	Time	09:25:03	Heart rate max	165 bpm		
Sport	[illegible]	Duration	7:39:30.0				
Note	[illegible] Havling Europeans. 16/6/94. R2 6-7 knots increase 10-			Selection	14:57:03 - 16:05:48 (1:08:45.0)		

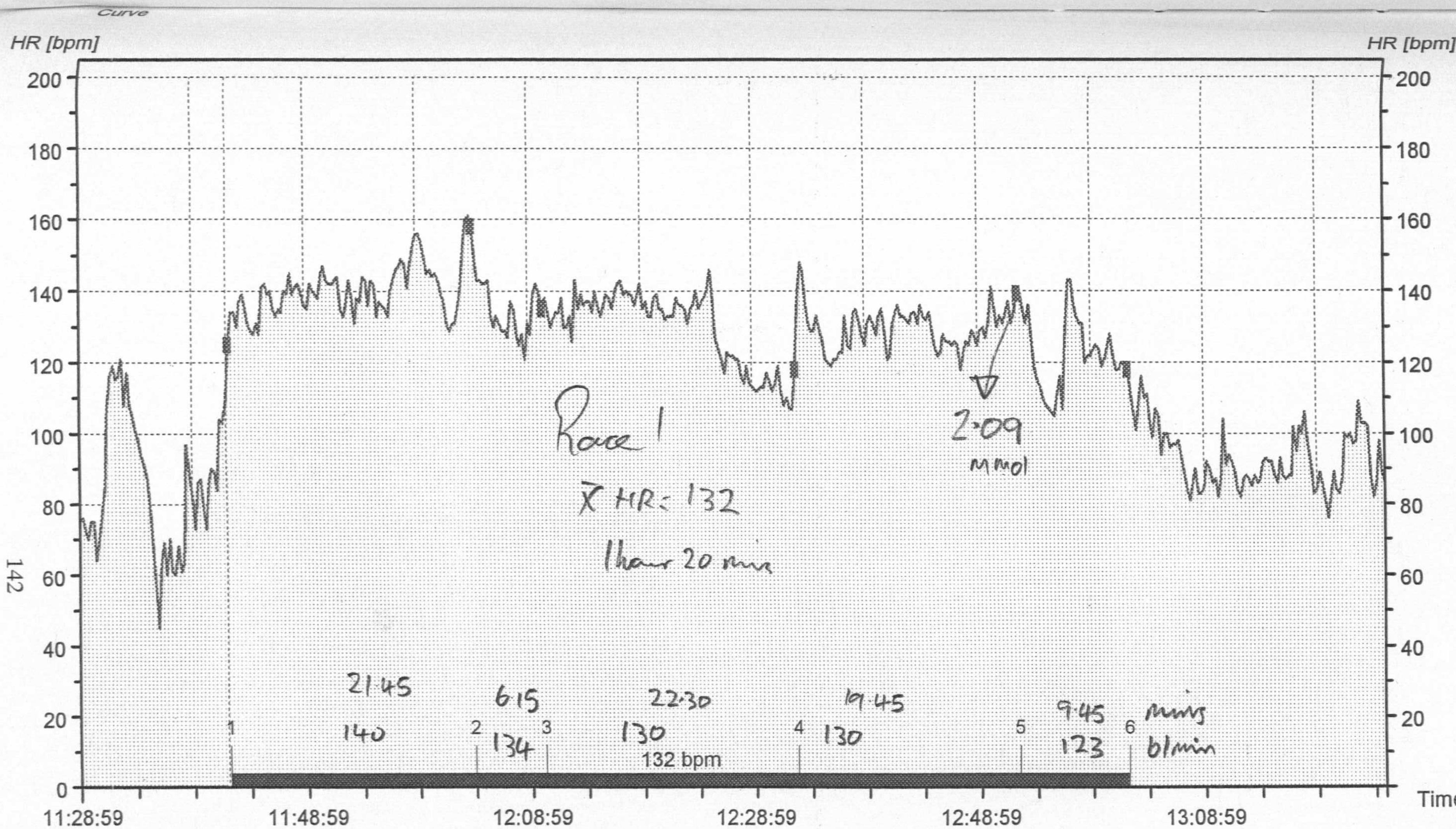
MODERATE



Time: 13:26:44

HR: 102 bpm

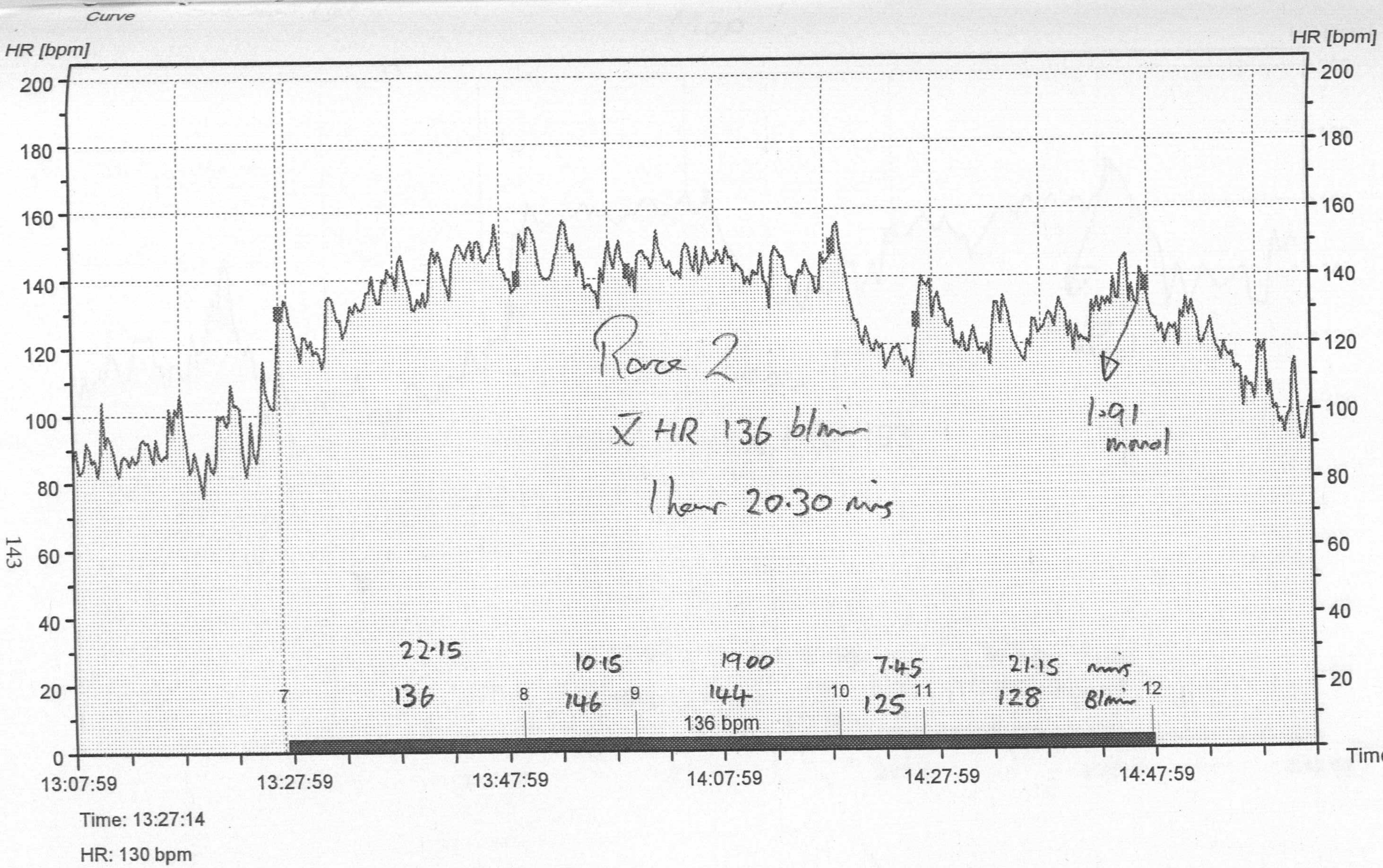
Person	SUBJECT 5	Date	18/06/1994	Heart rate	133 / 161	Limits 1	150 - 200
Exercise		Time	09:42:59	Max. HR	0	Limits 2	150 - 200
Sport		Duration	6:04:15.0	Distance		Thresholds	150 - 200
Note	R1 12-14 knots, R2 14-16 knots (very choppy)			Selection	01:59:15 - 05:03:00 (2:38:45.0)		



Time: 11:41:59

HR: 109 bpm

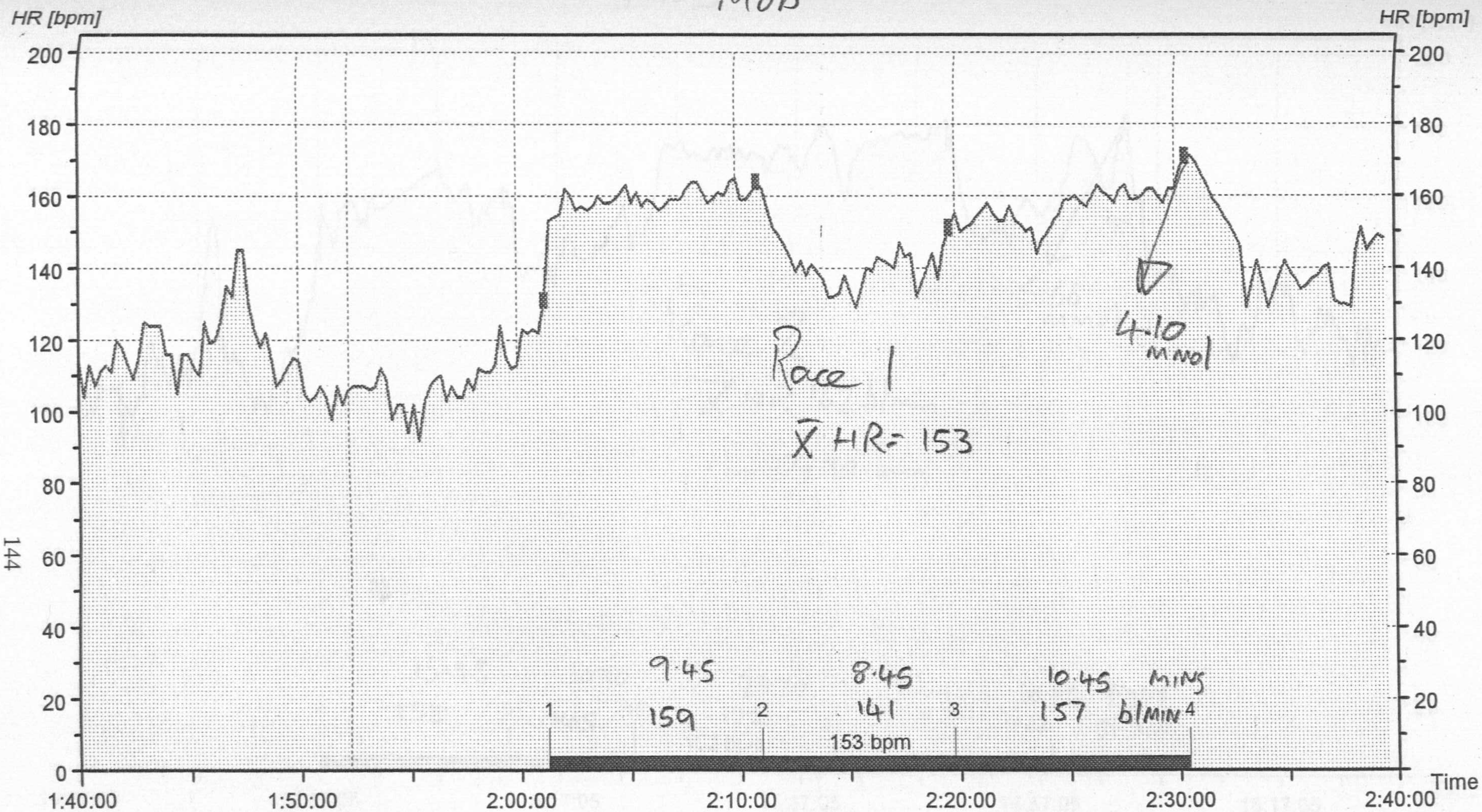
Person	SUBJECT 5	Date	18/06/1994	Heart rate avera	132 bpm		
Exercise	18-6	Time	09:42:59	Heart rate max	161 bpm		
Sport		Duration	6:04:15.0				
Note	Hayling Europeans, 18/6/94. 14-16 knots			Selection	11:42:14 - 13:02:14 (1:20:00.0)		



Person	SUBJECT 5	Date	18/06/1994	Heart rate avera	136 bpm		
Exercise	18-6	Time	09:42:59	Heart rate max	157 bpm		
Sport		Duration	6:04:15.0				
Note	Hayling Europeans, 18/6/94, 14-16 knots			Selection	13:27:29 - 14:47:59 (1:20:30.0)		

Curve SUBJECT 6

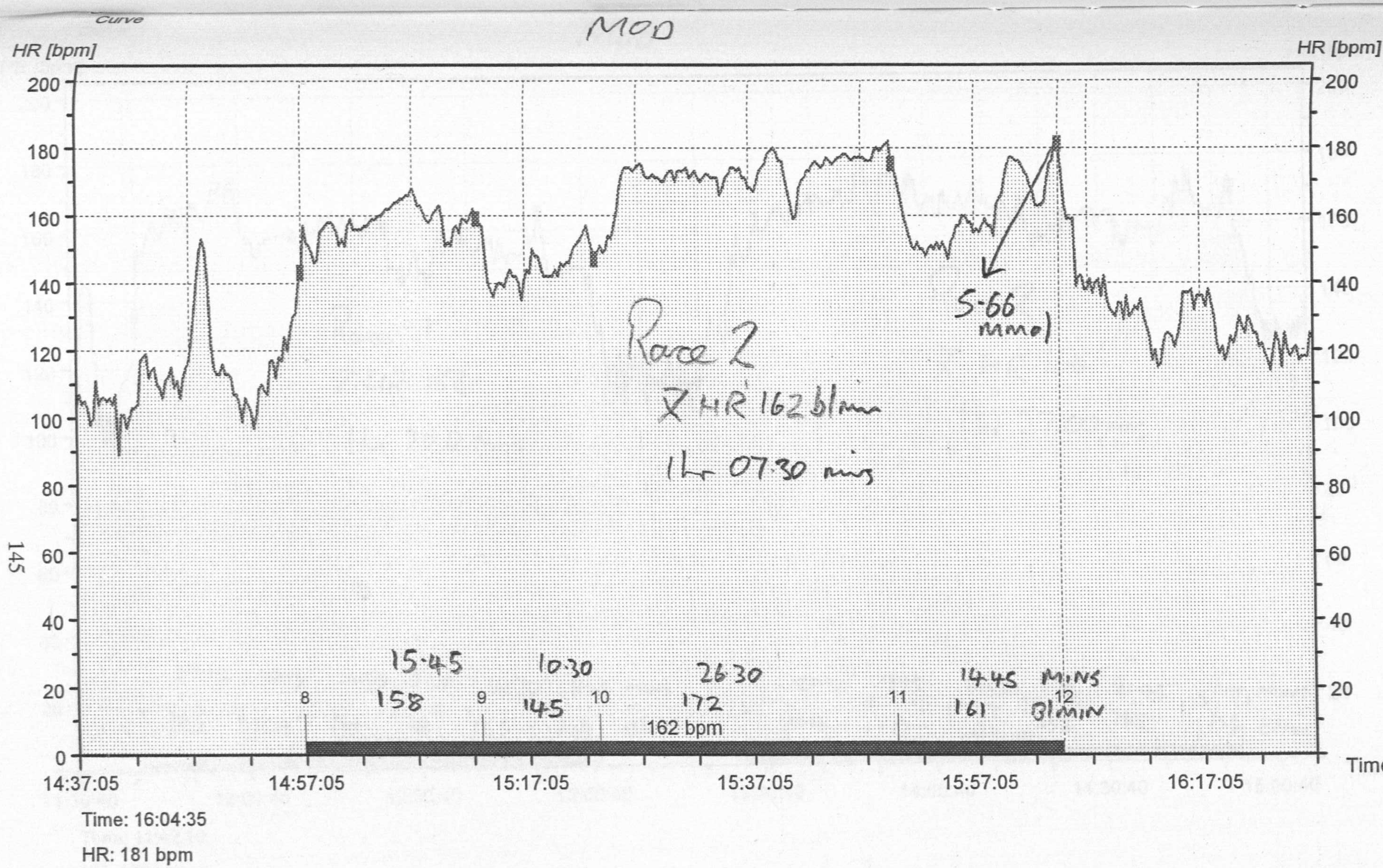
MOD



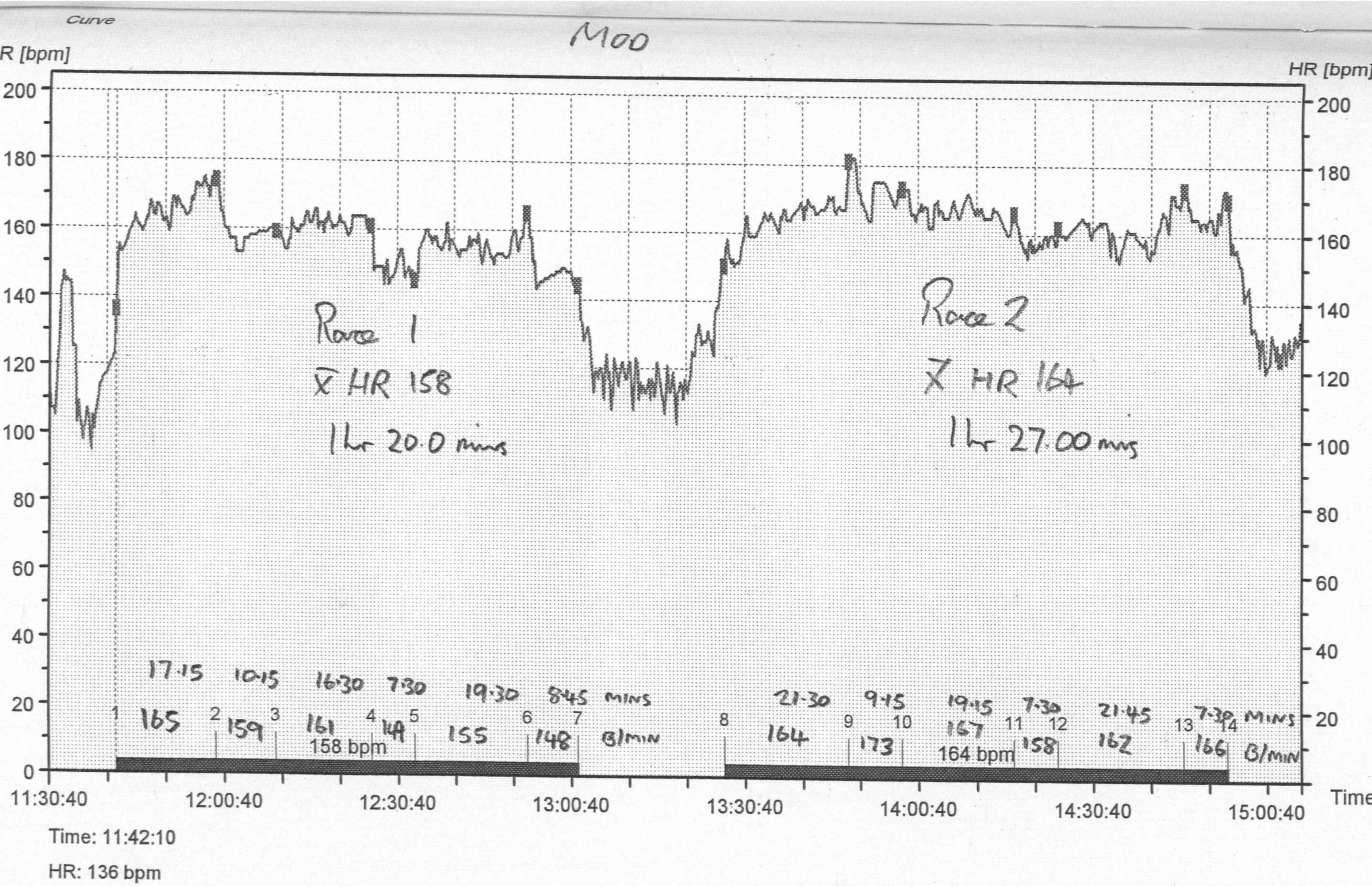
Time: 1:52:15

HR: 106 bpm

Person	SUBJECT 6	Date	19/02/1994	Heart rate avera	153 bpm	
Exercise	19-2	Time	09:24:19	Heart rate max	171 bpm	
Sport		Duration	2:39:30.0			
Note	Havling. 19/2/94. 8-12 knots			Selection	2:01:15 - 2:30:30 (0:29:15.0)	



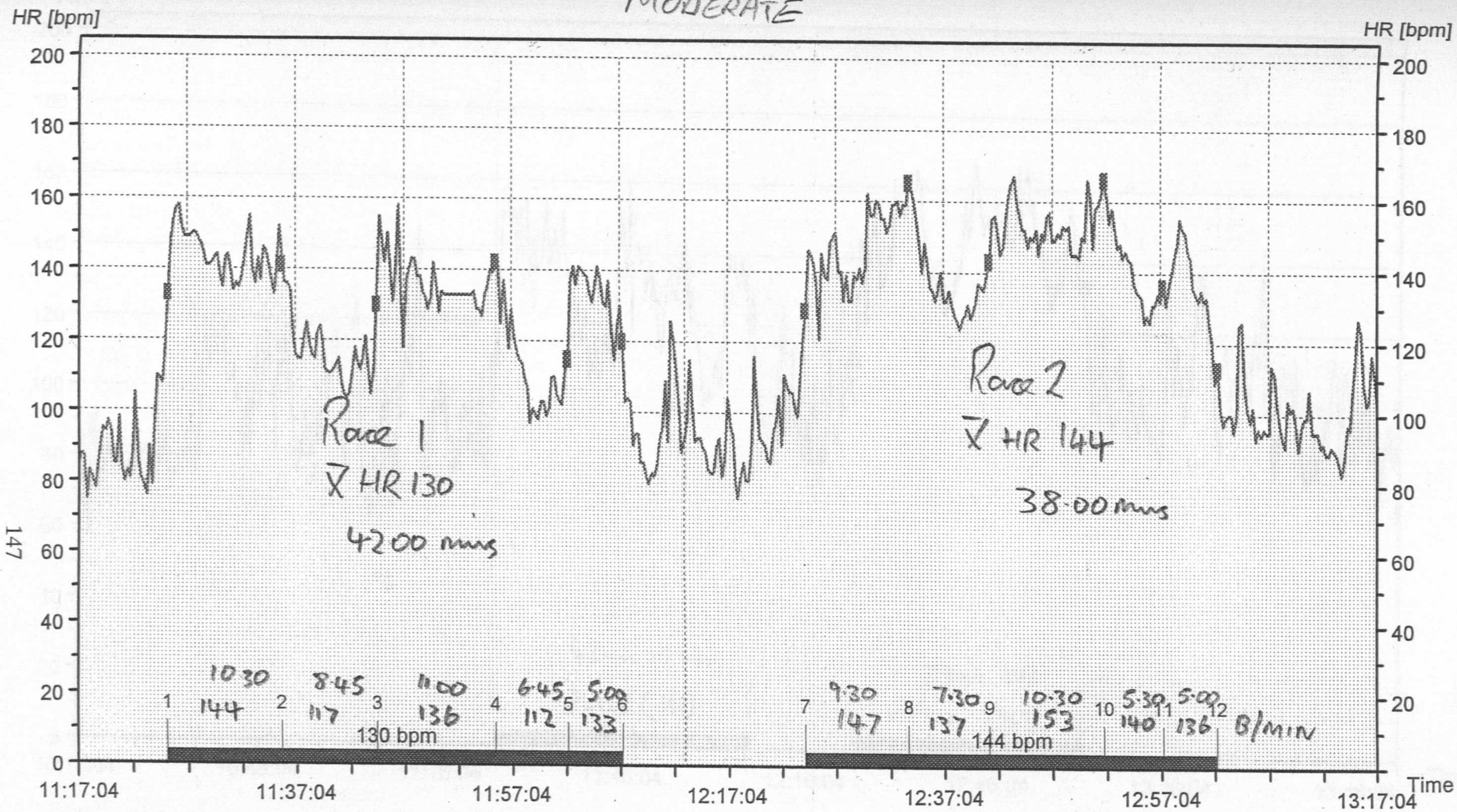
Person	SUBJECT 6	Date	16/06/1994	Heart rate avera	160 bpm		
Exercise	-16-6	Time	09:16:05	Heart rate max	182 bpm		
Sport		Duration	7:48:30.0				
Note	Hayling Europeans, 16/6/94. R2 6-7 knots increase 10-12			Selection	12:30:05 - 16:04:35 (2:30:45.0)		



Person	SUBJECT 6	Date	18/06/1994	Heart rate avera	161 bpm
Exercise	18-6	Time	09:17:40	Heart rate max	182 bpm
Sport		Duration	6:28:00.0		

Curve SUBJECT 7

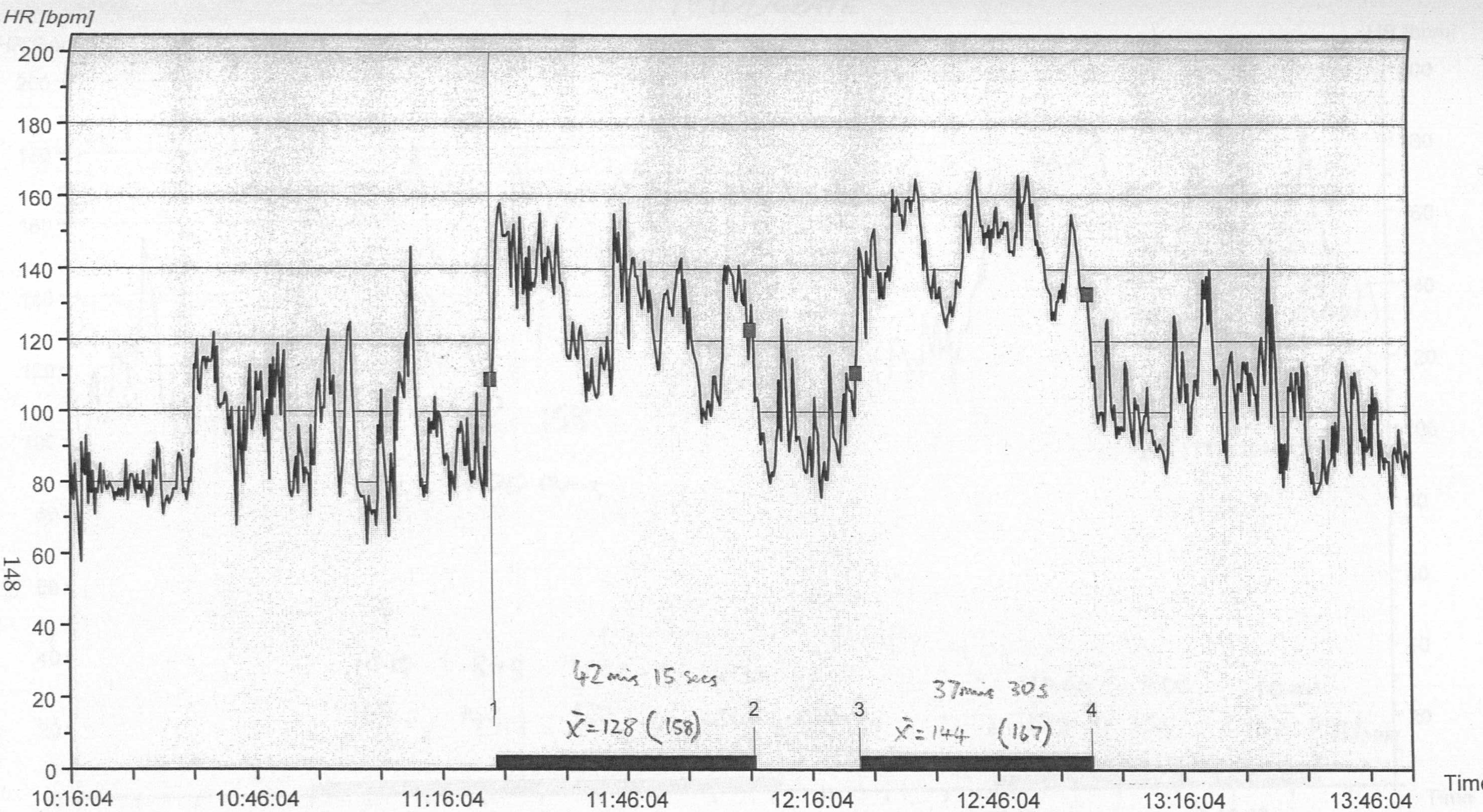
MODERATE



Time: 12:13:04

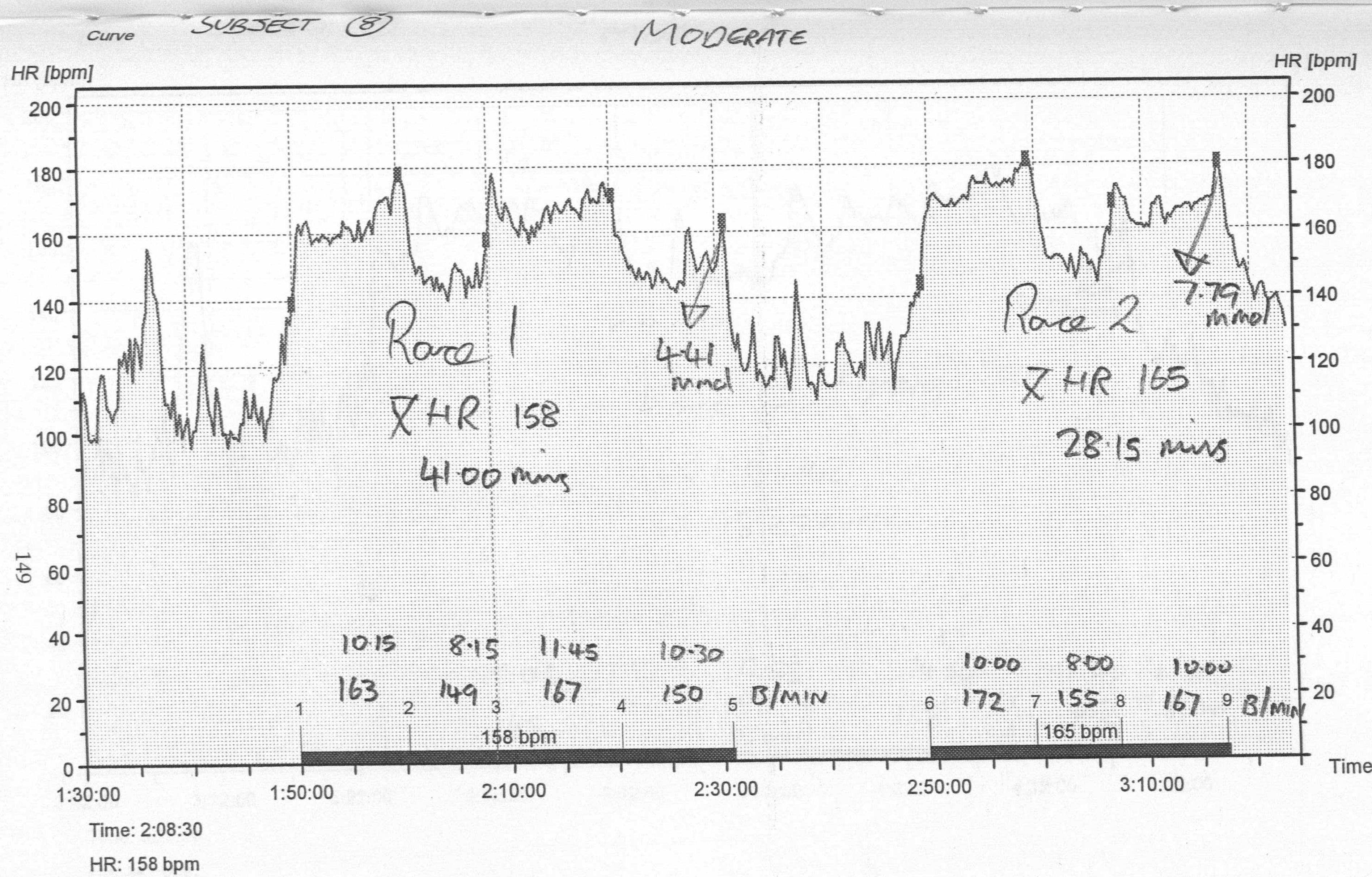
HR: 92 bpm

Person	SUBJECT 7	Date	19/02/1994	Heart rate avera	137 bpm		
Exercise	-19-2	Time	09:26:04	Heart rate max	167 bpm		
Sport		Duration	6:55:30.0				
Note	Havling 19/2/94 8-12 knots			Selection	11:25:19 - 13:02:19 (1:20:00.0)		



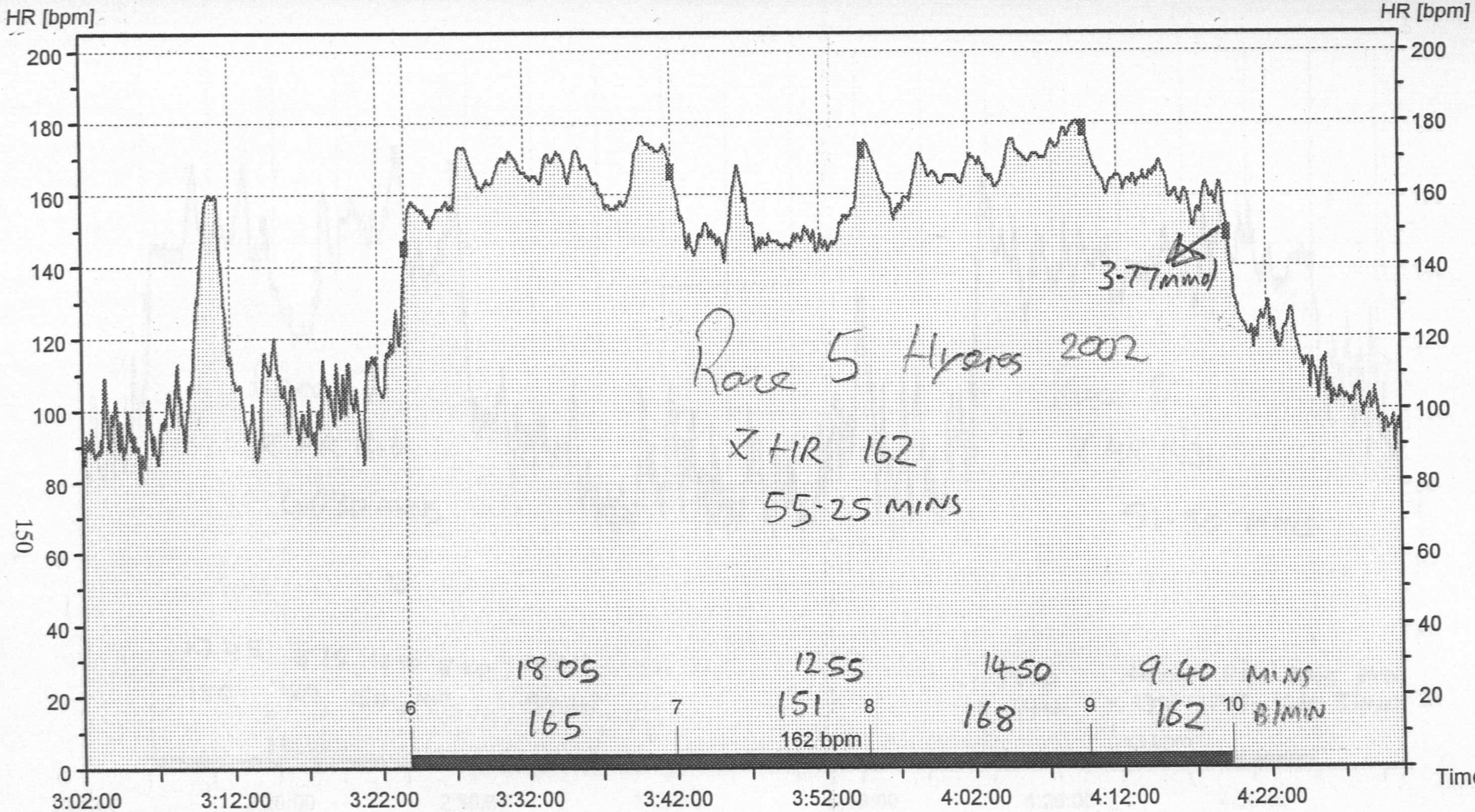
Time: 11:24:34
HR: 109 bpm

Person	SUBJECT 7	Date	19/02/1994	Heart rate	136 / 167	Limits 1	25 - 220
Exercise		Time	09:26:04	Max. HR	0	Limits 2	30 - 215
Sport		Duration	6:55:30.0	Distance		Thresholds	25 - 220
Note	Feb 1994			Selection	01:58:45 - 03:35:30 (1:19:45.0)		



Person	SUBJECT (8)	Date	19/02/1994	Heart rate avera	161 bpm		
Exercise	19-2	Time	09:36:29	Heart rate max	181 bpm		
Sport		Duration	3:23:15.0				
Note	Hayling 19/2/94 8-12 knots			Selection	1:50:00 - 3:17:30 (1:09:15.0)		

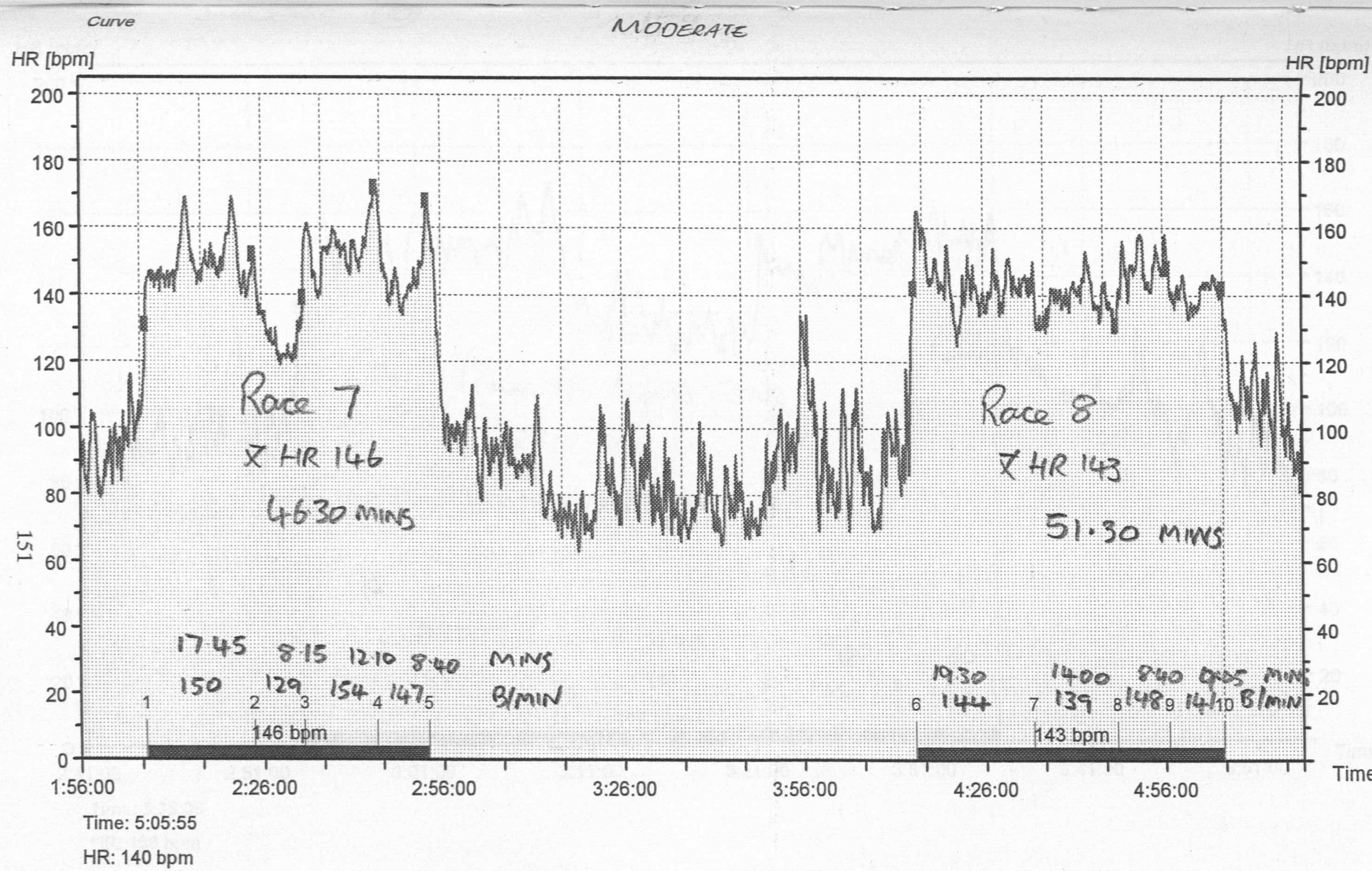
Curve SUBJECT 9 MOD



Time: 3:23:50

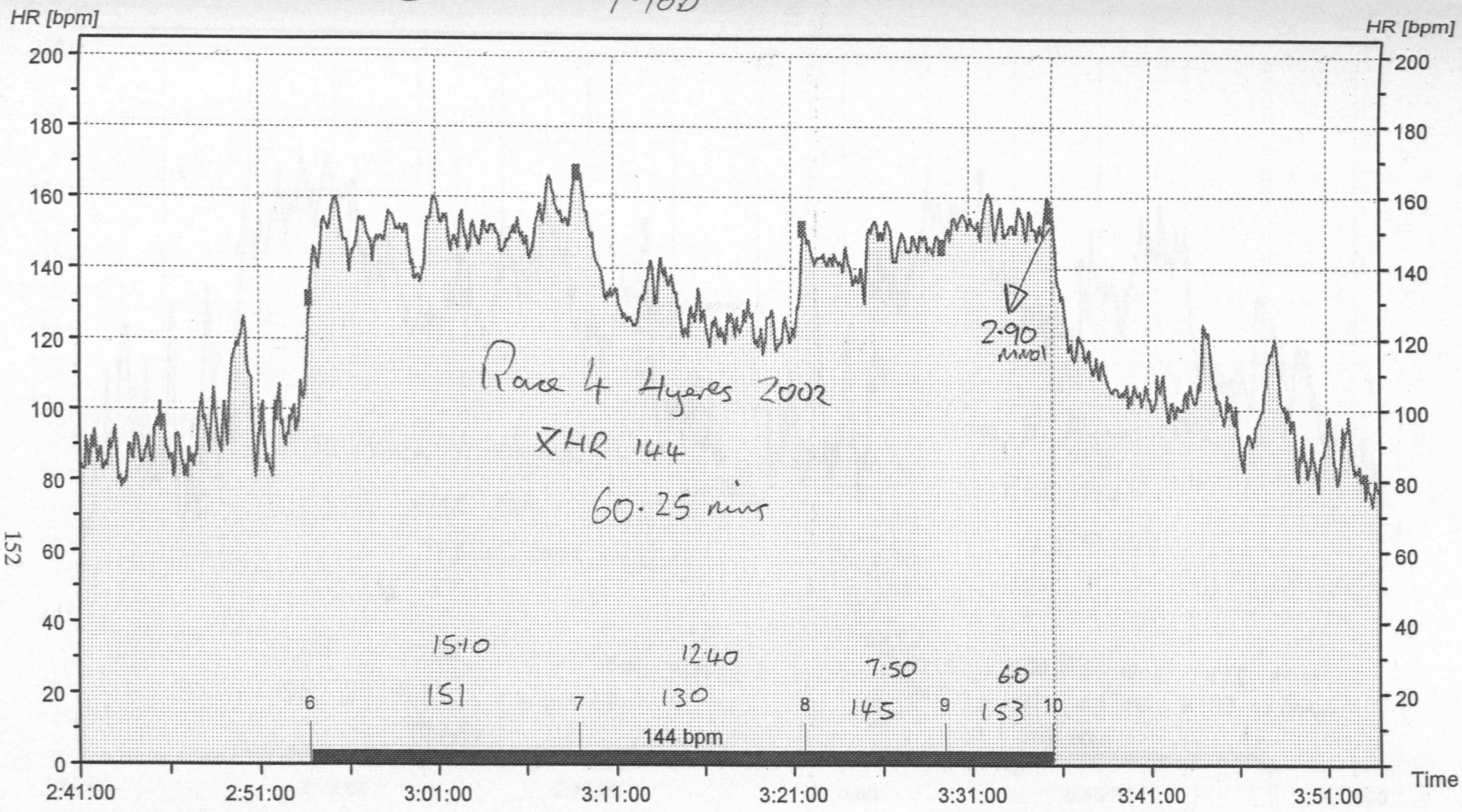
HR: 141 bpm

Person	SUBJECT 9	Date	22/04/2002	Heart rate avera	162 bpm		
Exercise		Time	12:54:05	Heart rate max	180 bpm		
Sport	Sailing	Duration	5:13:55.0				



Person	SUBJECT 9	Date	24/04/2002	Heart rate avera	144 bpm		
Exercise	24/04/2002 14:32	Time	14:32:46	Heart rate max	174 bpm		
Sport	Sailing	Duration	5:49:45.0				

Curve SUBJECT 10 MOD



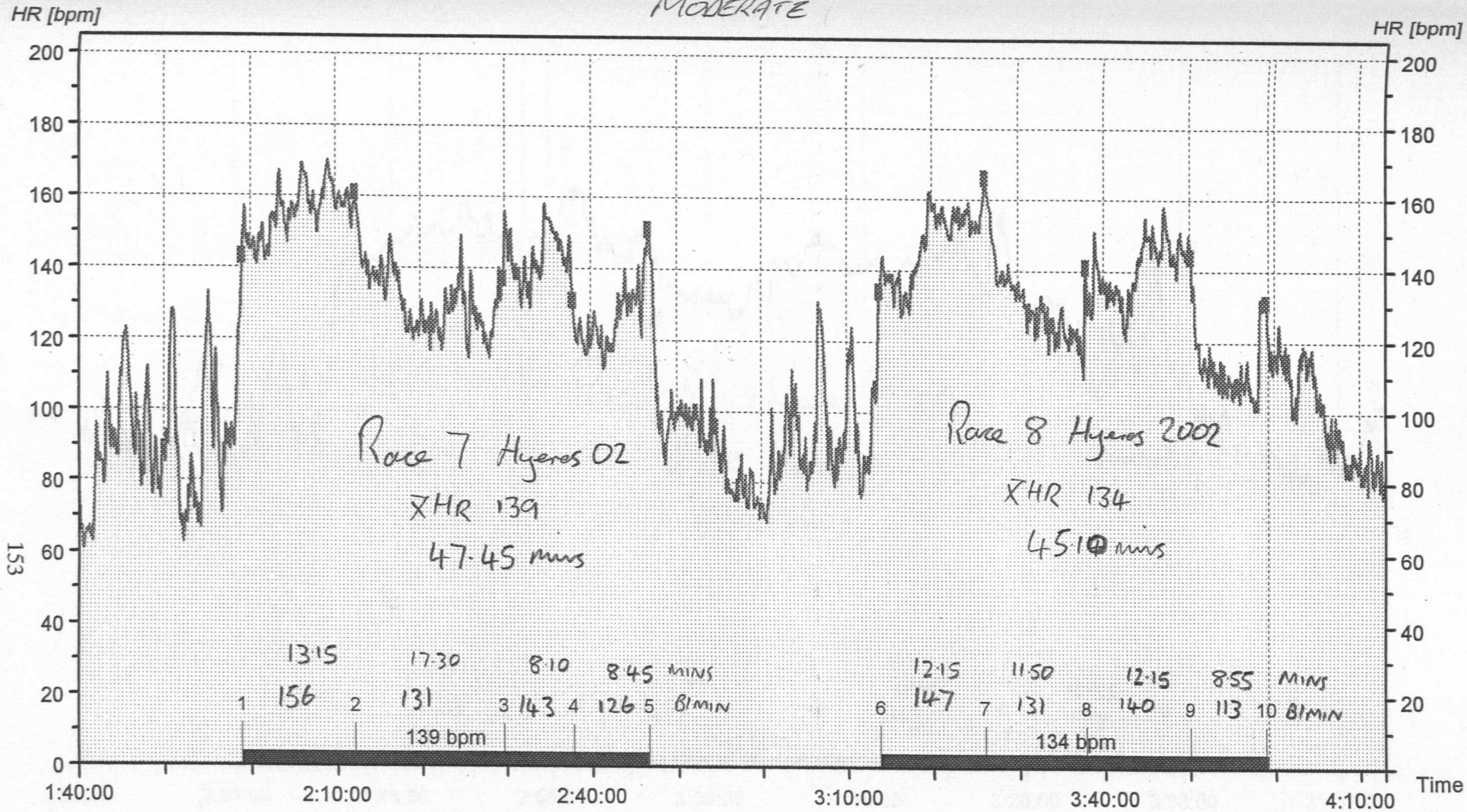
Time: 3:35:35

HR: 156 bpm

Person	SUBJECT 10	Date	22/04/2002	Heart rate avera	140 bpm		
Exercise		Time	12:53:07	Heart rate max	168 bpm		
Sport	Sailing	Duration	4:36:50.0				
Note	Laser Hyeres Races 4 & 4, 10 knots. Outer loop			Selection	1:33:05 - 3:35:35 (1:41:20.0)		

Curve

MODERATE

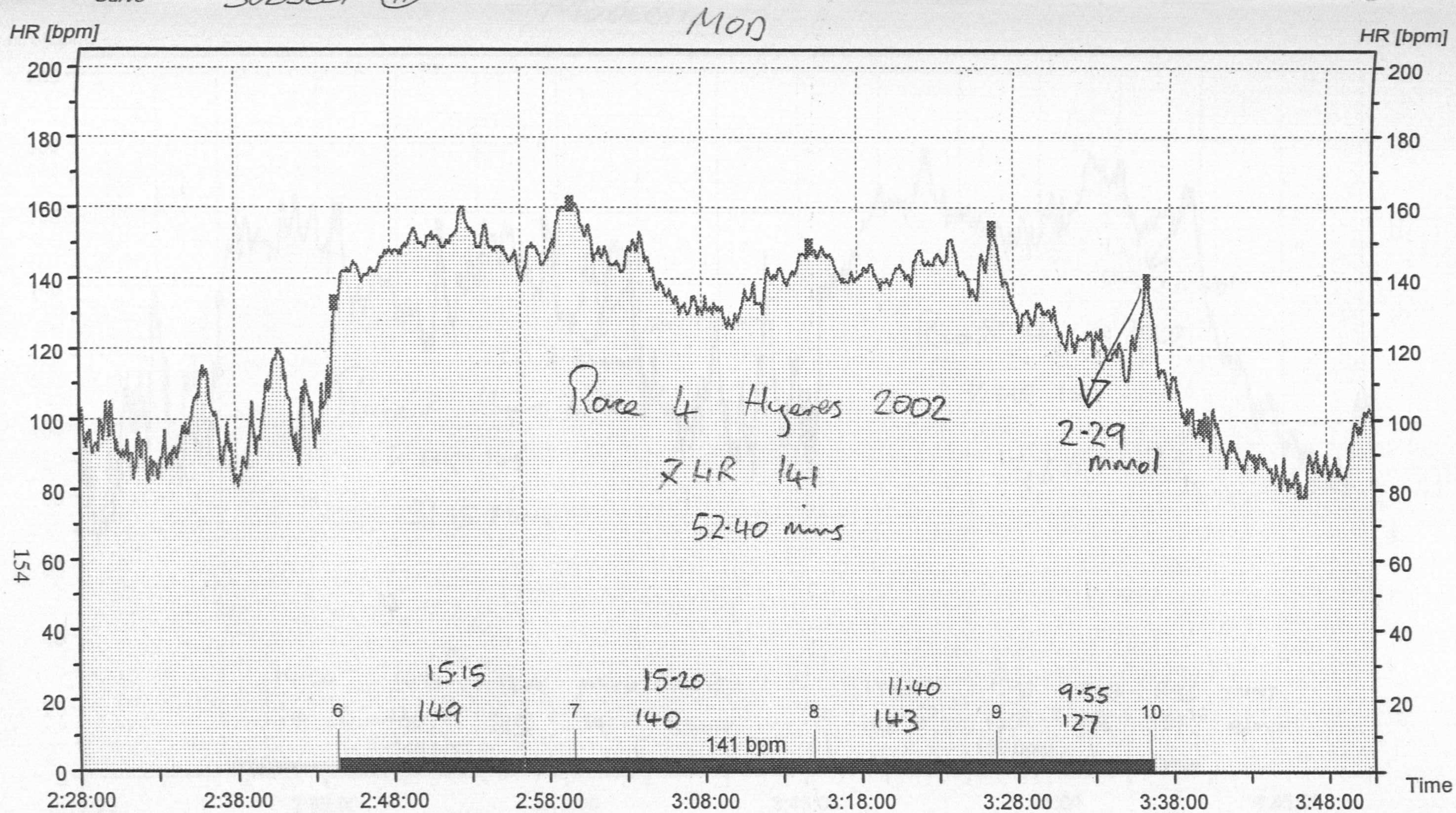


Time: 3:59:20

HR: 122 bpm

Person	SUBJECT 10	Date	24/04/2002	Heart rate avera	137 bpm	
Exercise	24/04/2002 15:06	Time	15:06:58	Heart rate max	170 bpm	
Sport		Duration	4:36:45.0			
Note	Hyeres day 4 race 7 & 8. 8-11 knots.			Selection	1:59:00 - 3:59:20 (1:33:10.0)	

Curve SUBJECT (11)



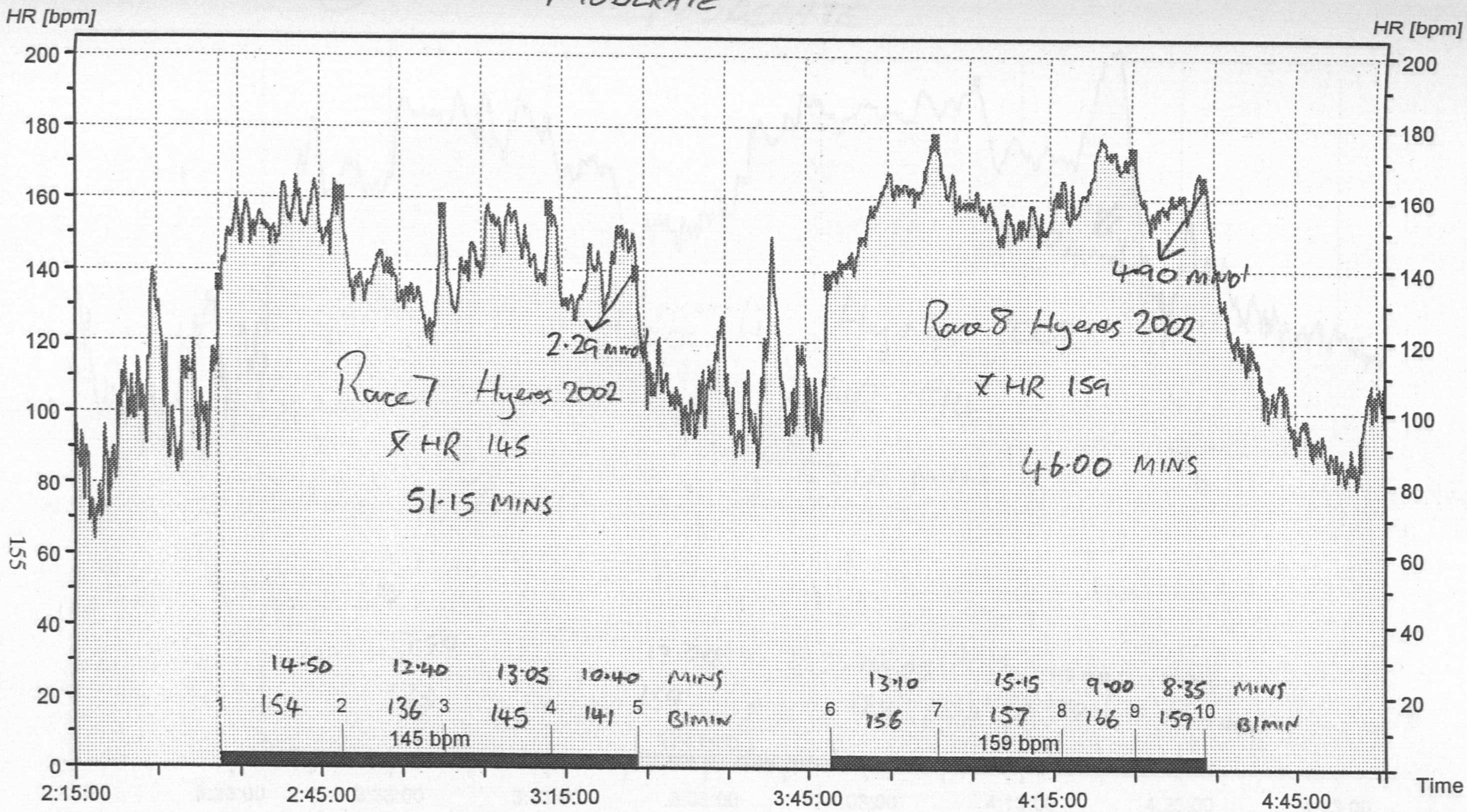
Time: 2:56:25

HR: 140 bpm

Person	SUBJECT (11)	Date	22/04/2002	Heart rate avera	142 bpm		
Exercise		Time	13:02:43	Heart rate max	164 bpm		
Sport	Sailing	Duration	4:24:20.0				
Note	Laser Hyeres Races 4, 10 knots. Outer loop			Selection	1:23:05 - 3:36:45 (1:53:05.0)		

Curve

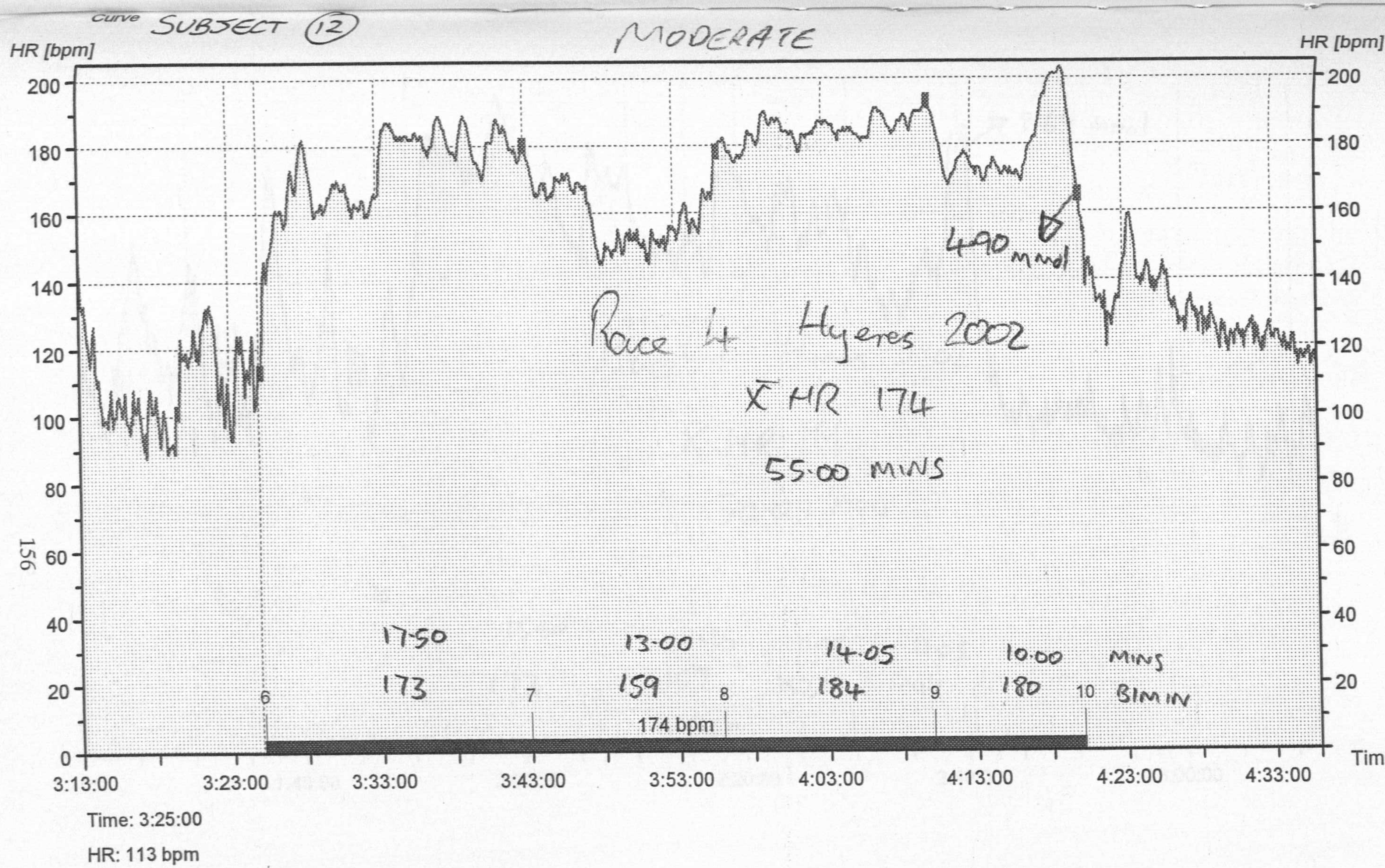
MODERATE



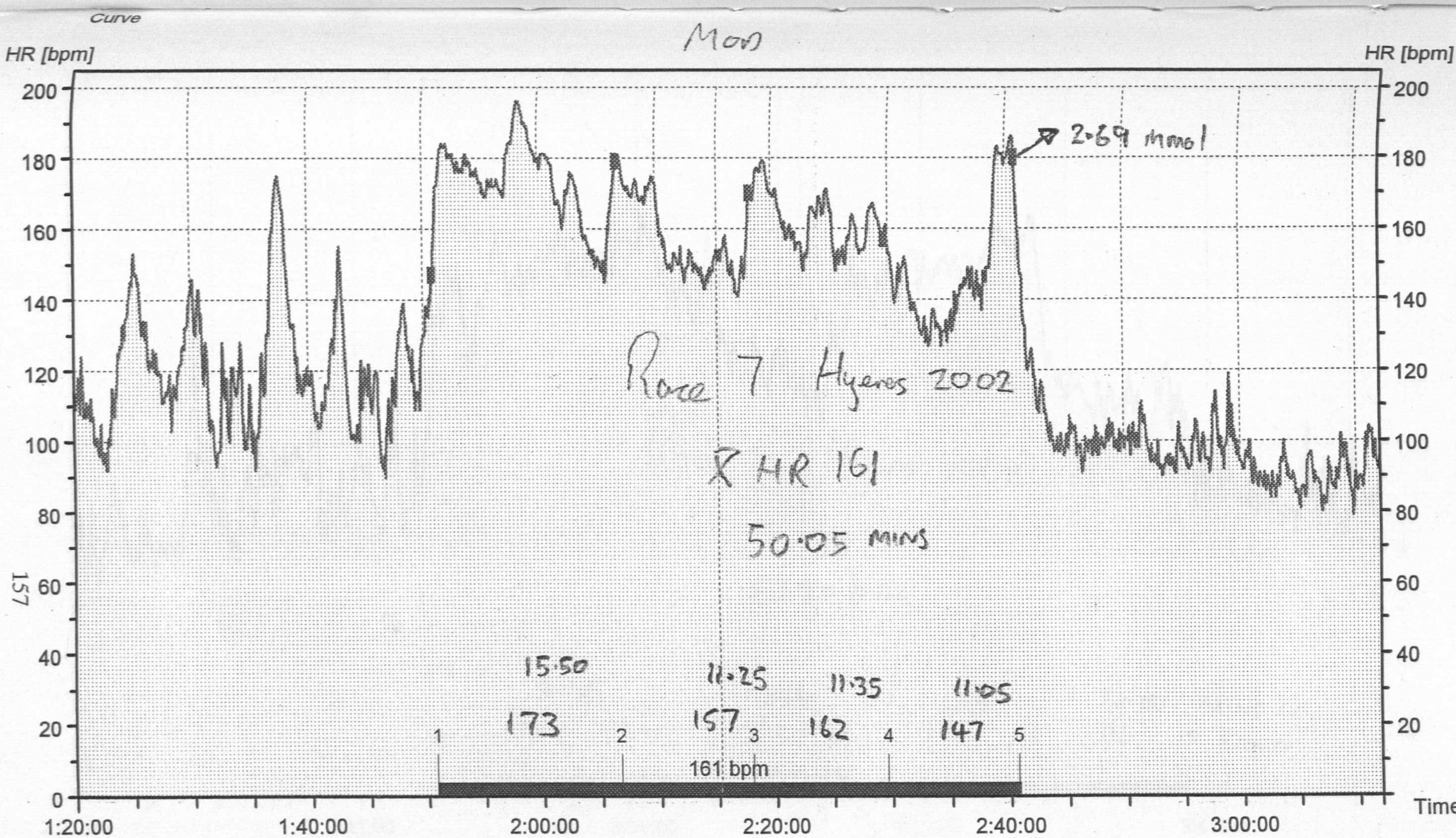
Time: 2:32:40

HR: 136 bpm

Person	SUBJECT 11	Date	24/04/2002	Heart rate avera	151 bpm		
Exercise	24/04/2002 14:33	Time	14:33:04	Heart rate max	177 bpm		
Sport	Sailing	Duration	5:50:25.0				
Note	Hyeres day 4 race 7 & 8. 8-11 knots R 8 worked to catch up			Selection	2:32:50 - 4:33:55 (1:37:25.0)		



Person	SUBJECT 12	Date	22/04/2002	Heart rate avera	162 bpm		
Exercise		Time	12:52:37	Heart rate max	203 bpm		
Sport	Sailing	Duration	5:21:10.0				
Note	Laser Hyeres Races 4: 10 knots, Outer loop			Selection	1:33:15 - 4:20:10 (1:58:00.0)		

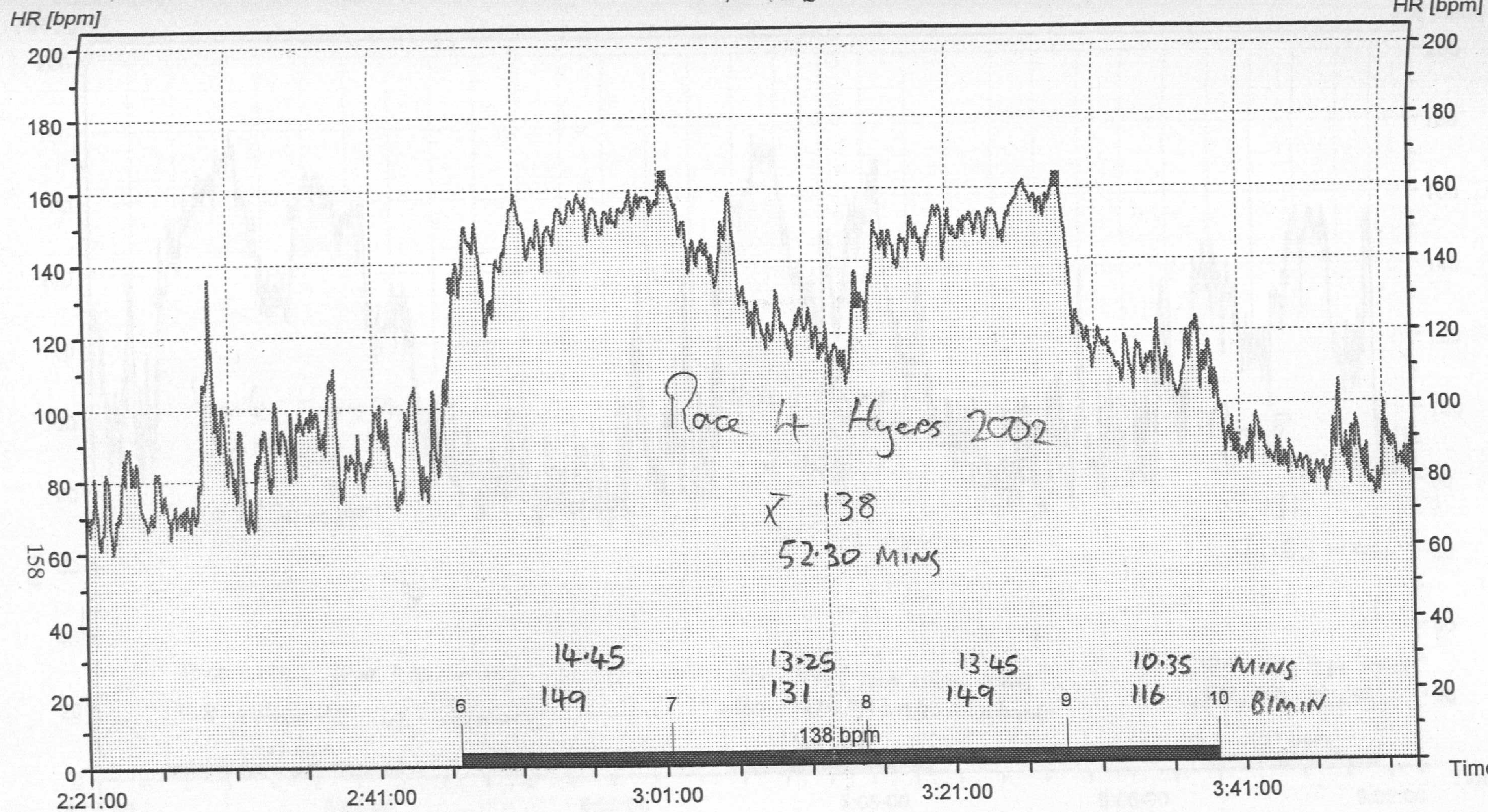


Time: 2:15:15

HR: 154 bpm

Person	SUBJECT 12	Date	24/04/2002	Heart rate avera	161 bpm		
Exercise	24/04/2002 14:48	Time	14:48:07	Heart rate max	196 bpm		
Sport	Sailing	Duration	5:28:20.0				
Note	Hyeres day 4 race 7. 8-11 knots R8 = retired			Selection	1:50:50 - 2:40:55 (0:50:05.0)		

Curve SUBJECT 13 MOD

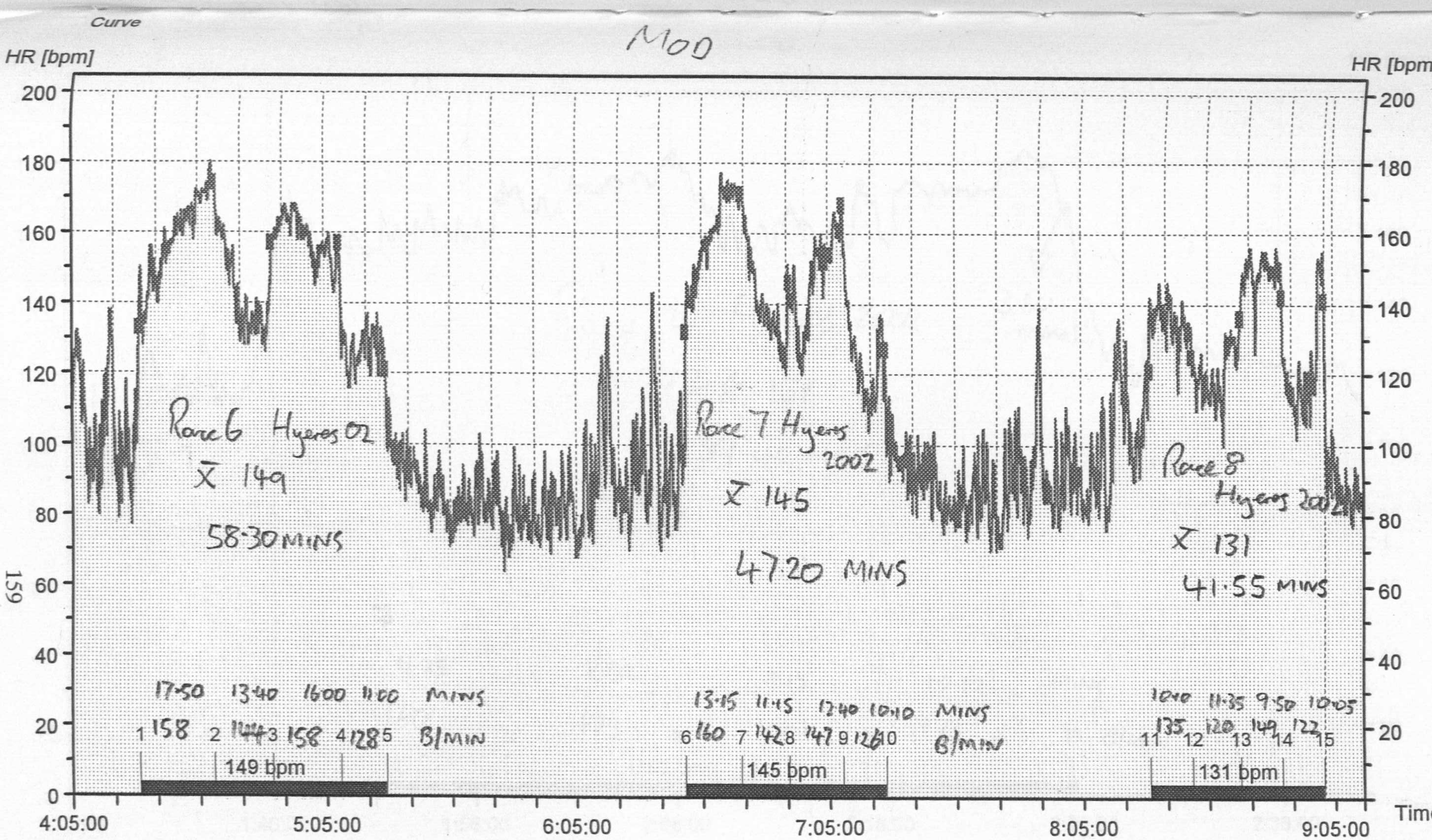


Time: 3:12:30

HR: 122 bpm

Person	SUBJECT 13	Date	22/04/2002	Heart rate avera	138 bpm		
Exercise		Time	13:00:30	Heart rate max	164 bpm		
Sport	Sailing	Duration	4:33:35.0				
Note	Laser Hyeres Race 4: 10 knots. Outer loop			Selection	2:46:40 - 3:39:10 (0:52:30.0)		

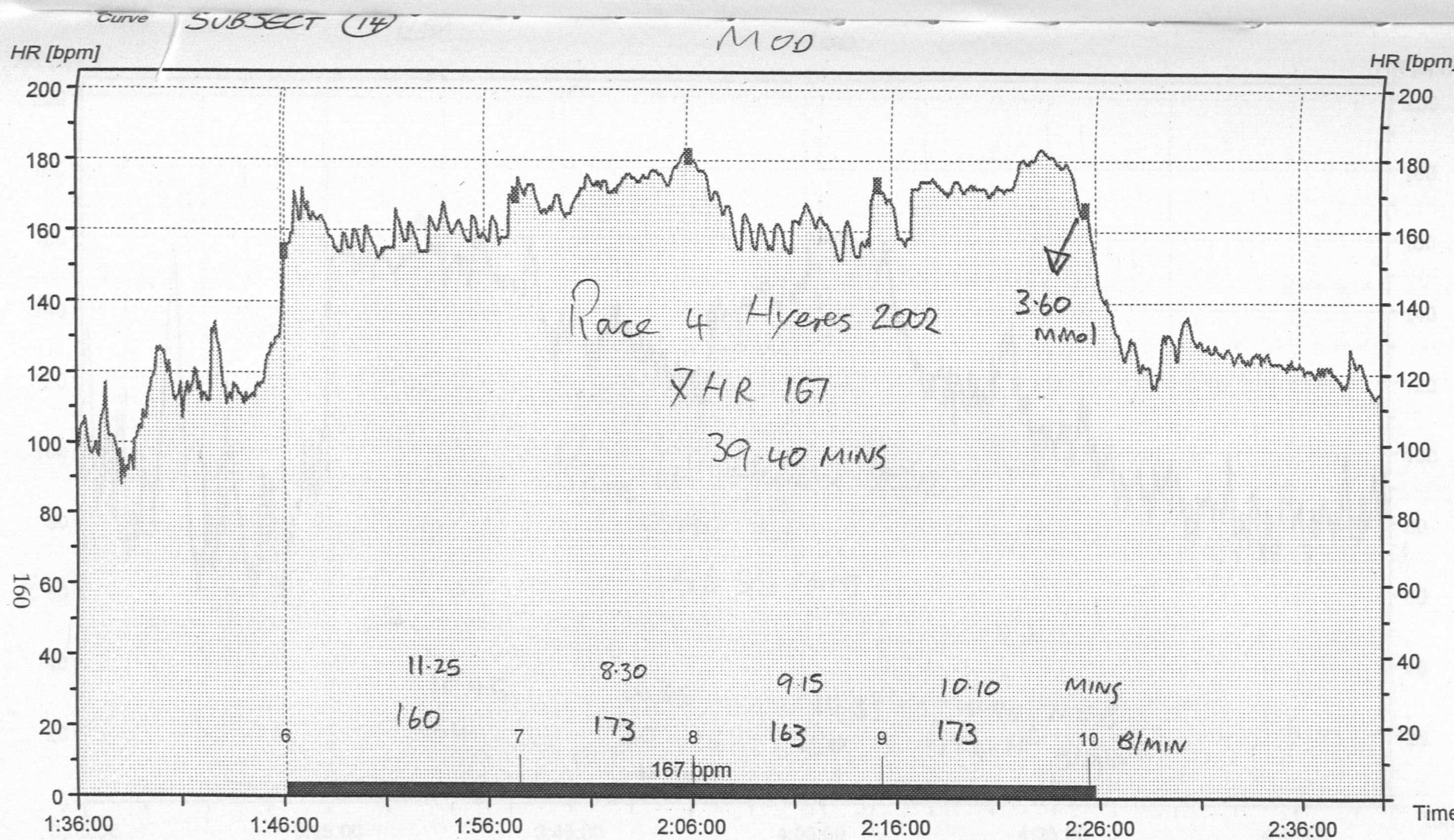
Mod



Time: 9:02:45

HR: 141 bpm

Person	SUBJECT 13	Date	24/04/2002	Heart rate avera	143 bpm		
Exercise	24/04/2002 10:34	Time	10:34:38	Heart rate max	180 bpm		
Sport	Sailing	Duration	9:48:20.0				
Note	Hyeres day 4 race 6, 7 & 8. 8-11 knots			Selection	4:21:00 - 9:02:45 (2:27:25.0)		

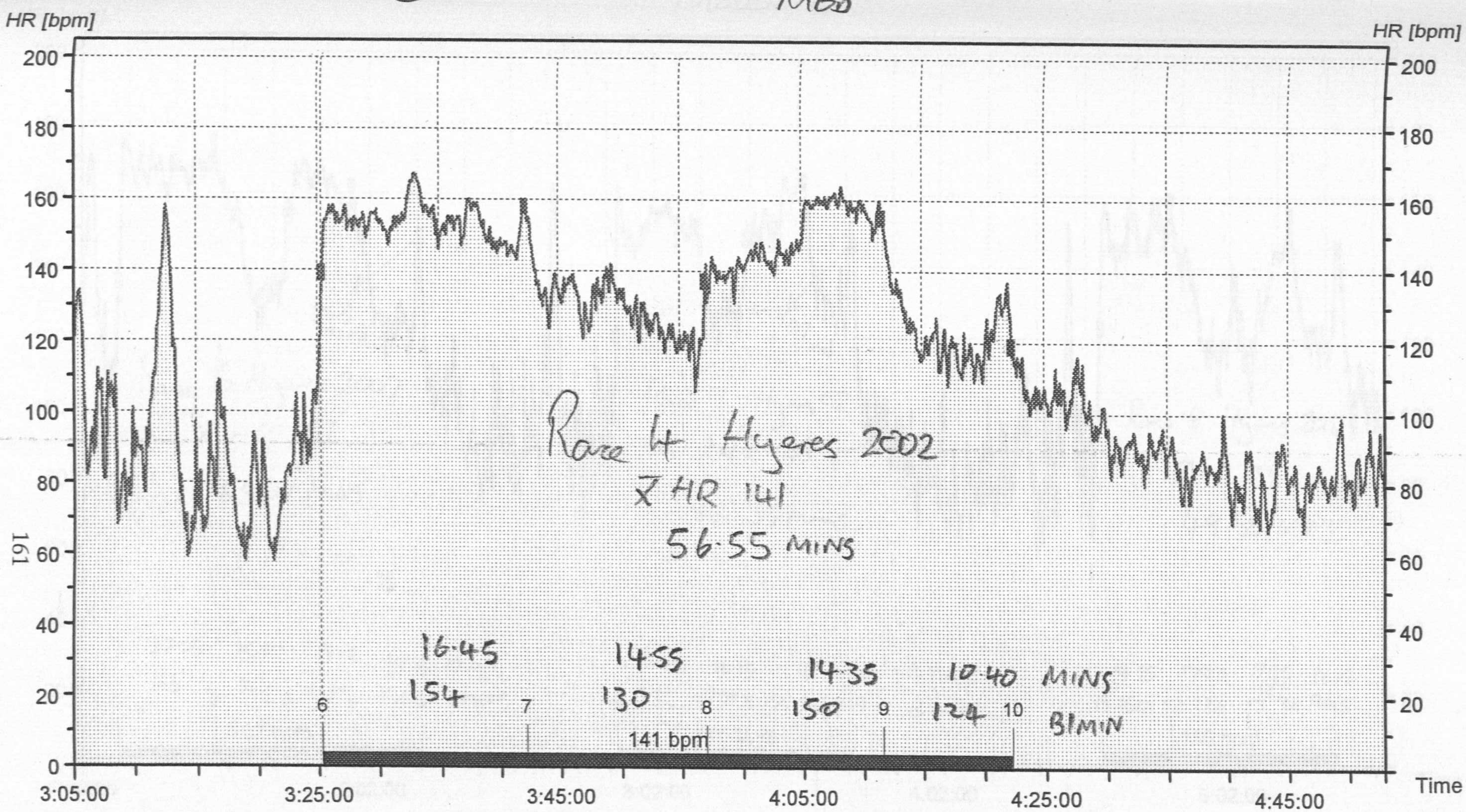


Time: 1:46:10

HR: 154 bpm

Person	SUBJECT (14)	Date	22/04/2002	Heart rate avera	167 bpm		
Exercise	22/04/2002 12:29	Time	13:16:47	Heart rate max	183 bpm		
Sport		Duration	2:55:10.0				
Note	Hyeres, Race 4 (10 knots) Outer loop			Selection	1:46:10 - 2:25:50 (0:39:40.0)		

Curve SUBJECT (15) MOD

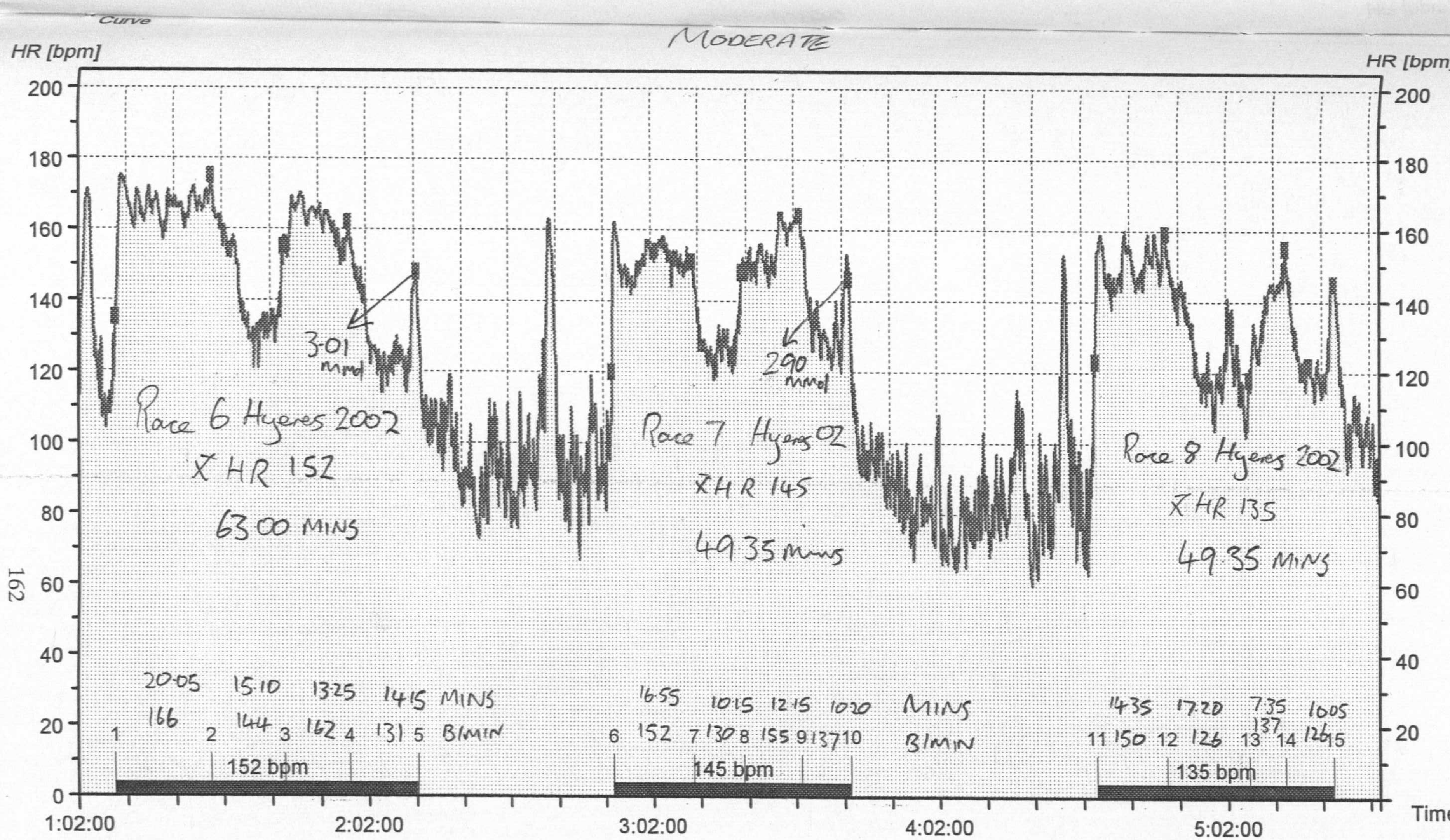


Time: 3:25:20

HR: 132 bpm

Person	SUBJECT (15)	Date	22/04/2002	Heart rate avera	142 bpm		
Exercise		Time	12:52:39	Heart rate max	177 bpm		
Sport		Duration	5:16:55.0				
Note	Laser Hyeres Races 4 (10 knots) - Outer loop			Selection	1:15:20 - 4:22:20 (1:58:00.0)		

MODERATE



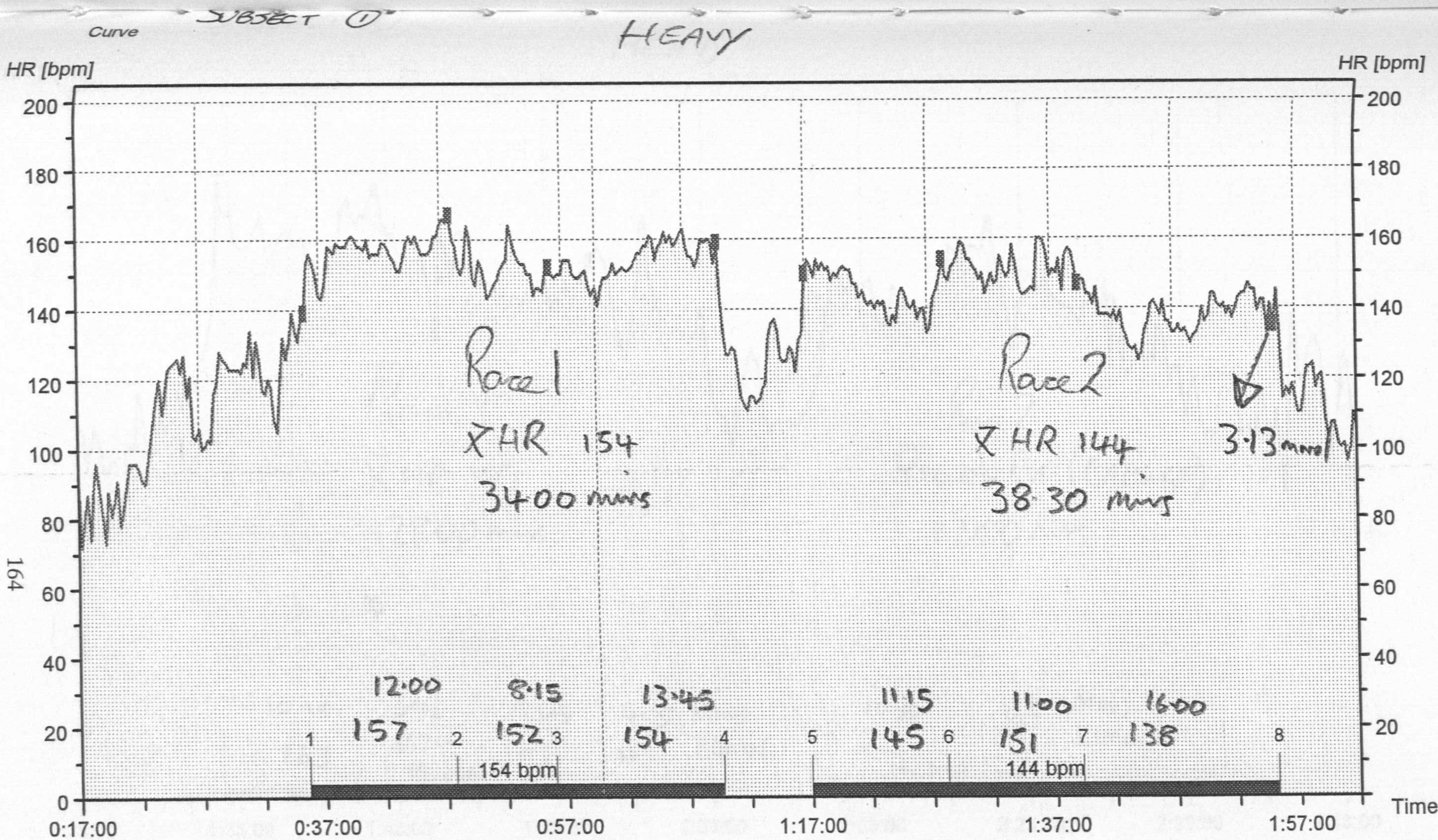
Time: 5:33:55

HR: 95 bpm

Person	SUBJECT 15	Date	24/04/2002	Heart rate avera	144 bpm		
Exercise	24/04/2002 13:45	Time	13:45:21	Heart rate max	175 bpm		
Sport	Sailing	Duration	6:07:25.0				
Note	Hyeres day 4 race 6, 7, & 8. 8-11 knots			Selection	1:09:35 - 5:24:30 (2:42:30.0)		

Chapter 4: On-water measures of single-handed dinghy sailing.

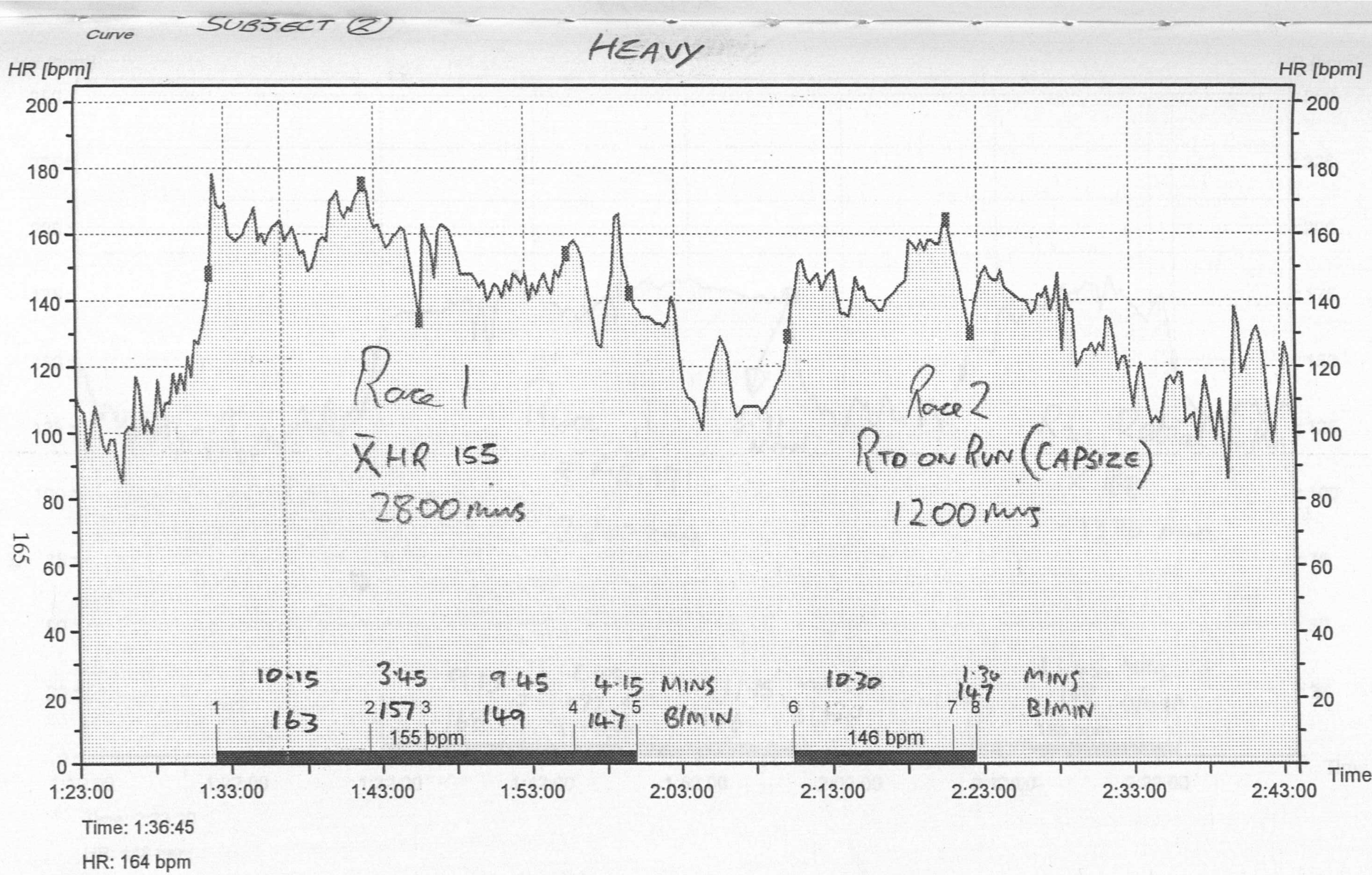
Heavy wind data for Laser sailing.



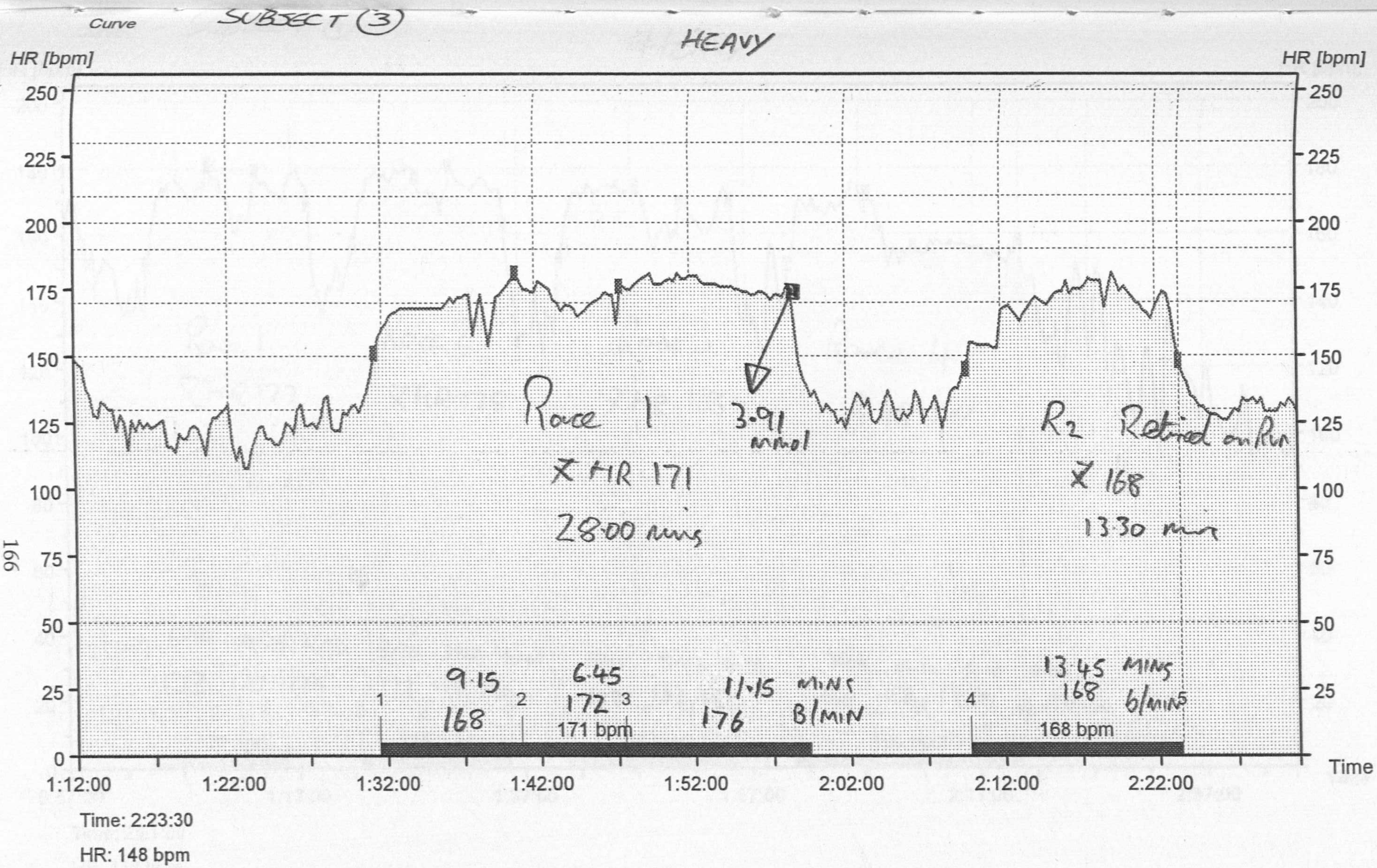
Time: 0:59:45

HR: 146 bpm

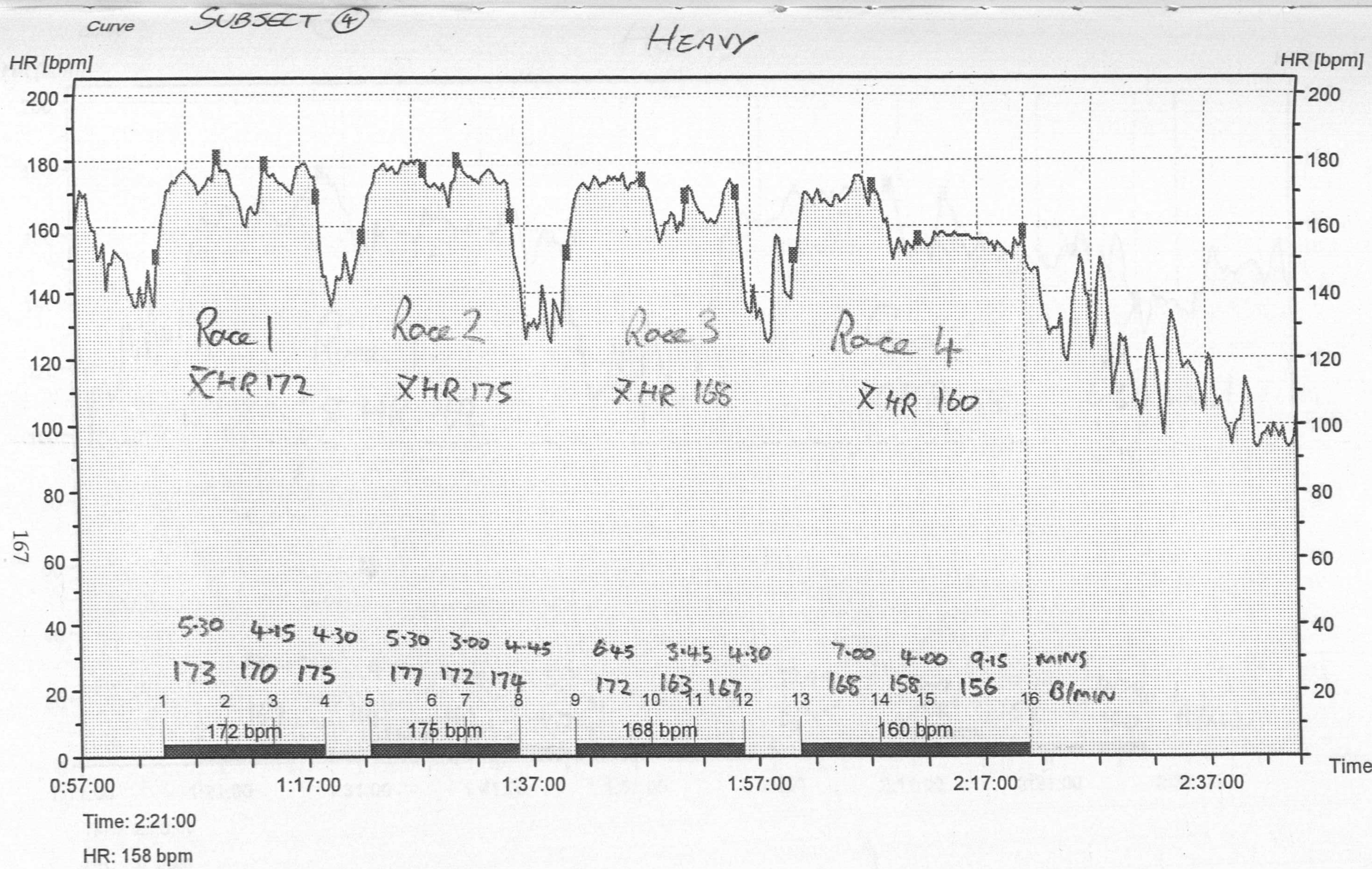
Person	SUBJECT ①	Date	20/11/1994	Heart rate avera	149 bpm		
Exercise		Time	09:36:32	Heart rate max	167 bpm		
Sport		Duration	3:58:45.0				
Note	Weymouth 20/11/94 15-18 knots windward/leeward/wind			Selection	0:35:45 - 1:55:15 (1:12:15.0)		



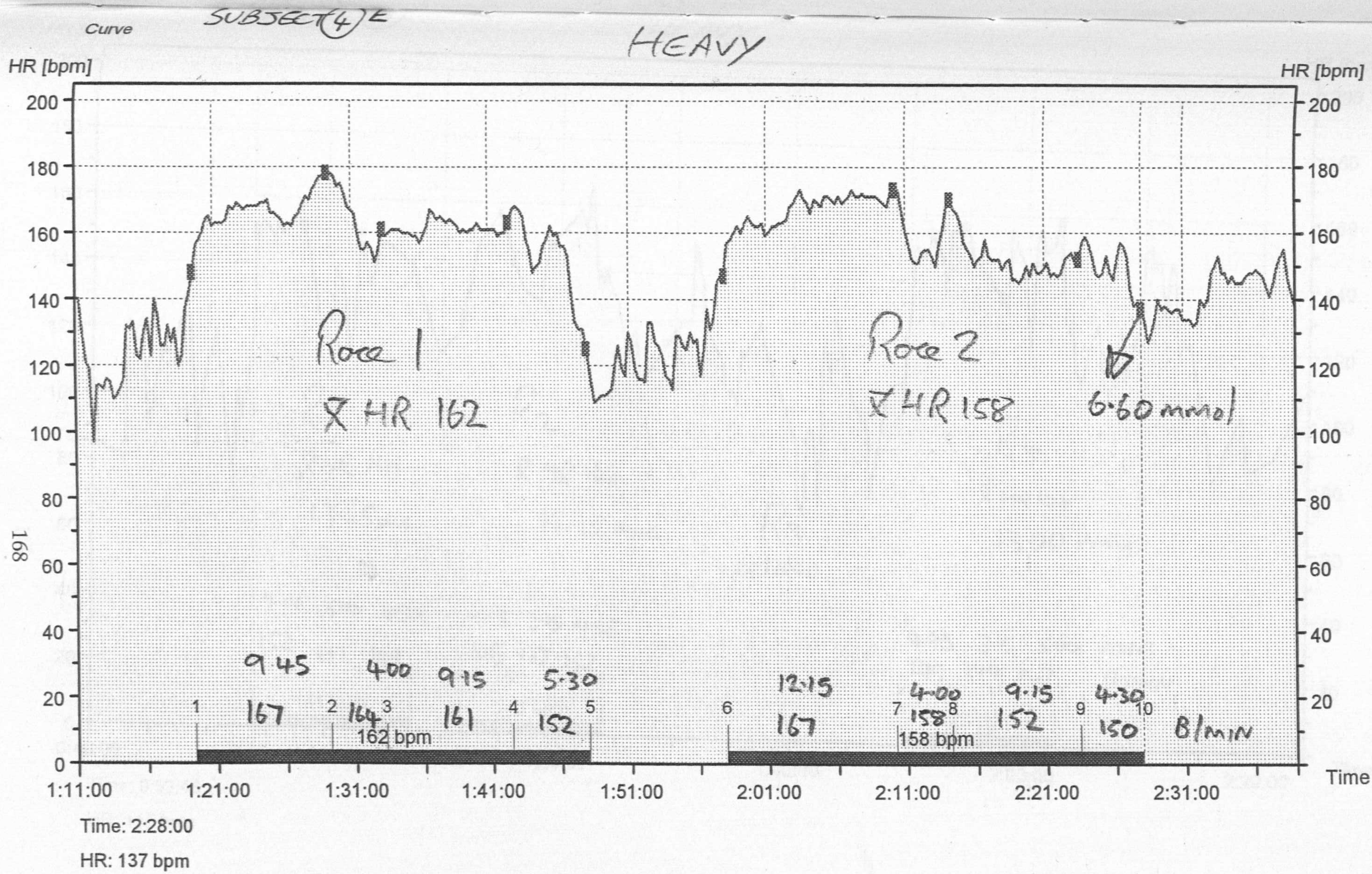
Person	SUBJECT (2)	Date	13/12/1993	Heart rate avera	152 bpm		
Exercise	-12-12	Time	09:04:06	Heart rate max	178 bpm		
Sport		Duration	3:21:45.0				
Note	Hayling 20-25 knots Sun 12/12/94 windward/leeward/windv			Selection	1:32:00 - 2:22:30 (0:40:00.0)		



Person	SUBJECT 3	Date	13/12/1993	Heart rate avera	170 bpm	Limits 1	50 - 200
Exercise	12-12	Time	09:04:52	Heart rate max	181 bpm	Limits 2	50 - 200
Sport		Duration	3:42:45.0				
Note	Hayling 1[illegible]2 20-25 knots, Sun 12/12/94. windward/leeward/windward			Selection	1:31:30 - 2:23:30 (0:41:45.0)		

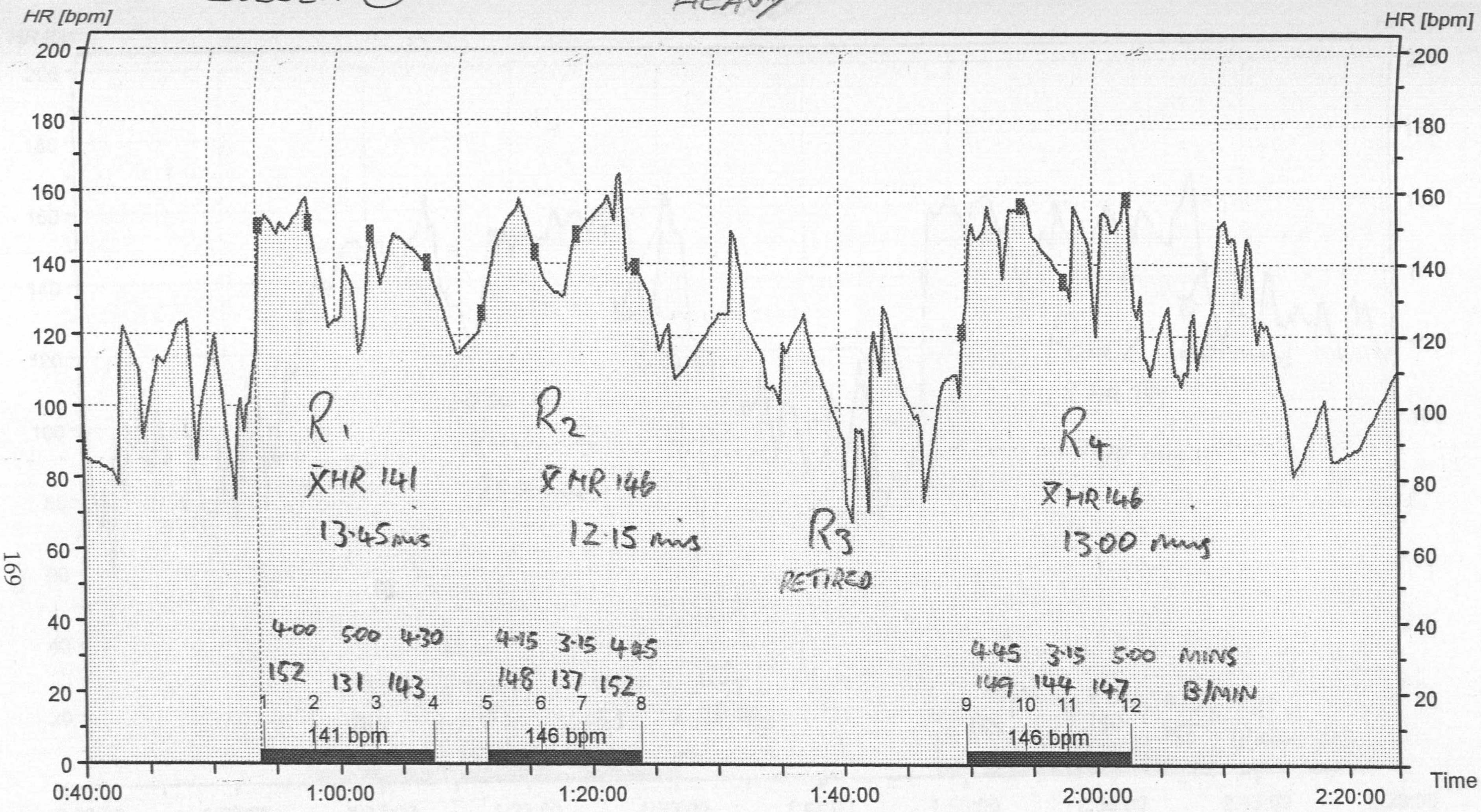


Person	SUBJECT 4	Date	11/12/1993	Heart rate avera	168 bpm		
Exercise	11-12	Time	09:46:26	Heart rate max	181 bpm		
Sport		Duration	2:57:00.0				
Note	Hayling 15-20 knots Sat 11/12/93 short windward/			Selection	1:04:15 - 2:21:00 (1:02:45.0)		



Person	SUBJECT 4	Date	12/12/1993	Heart rate avera	160 bpm		
Exercise	12-12	Time	09:16:40	Heart rate max	178 bpm		
Sport		Duration	3:59:00.0				
[illegible]	[illegible] 20-25 knots, Sun 12/12/94, windward/leeward/windward			Selection	1:19:30 - 2:28:00 (0:58:30.0)		

SUBJECT (5) HEAVY

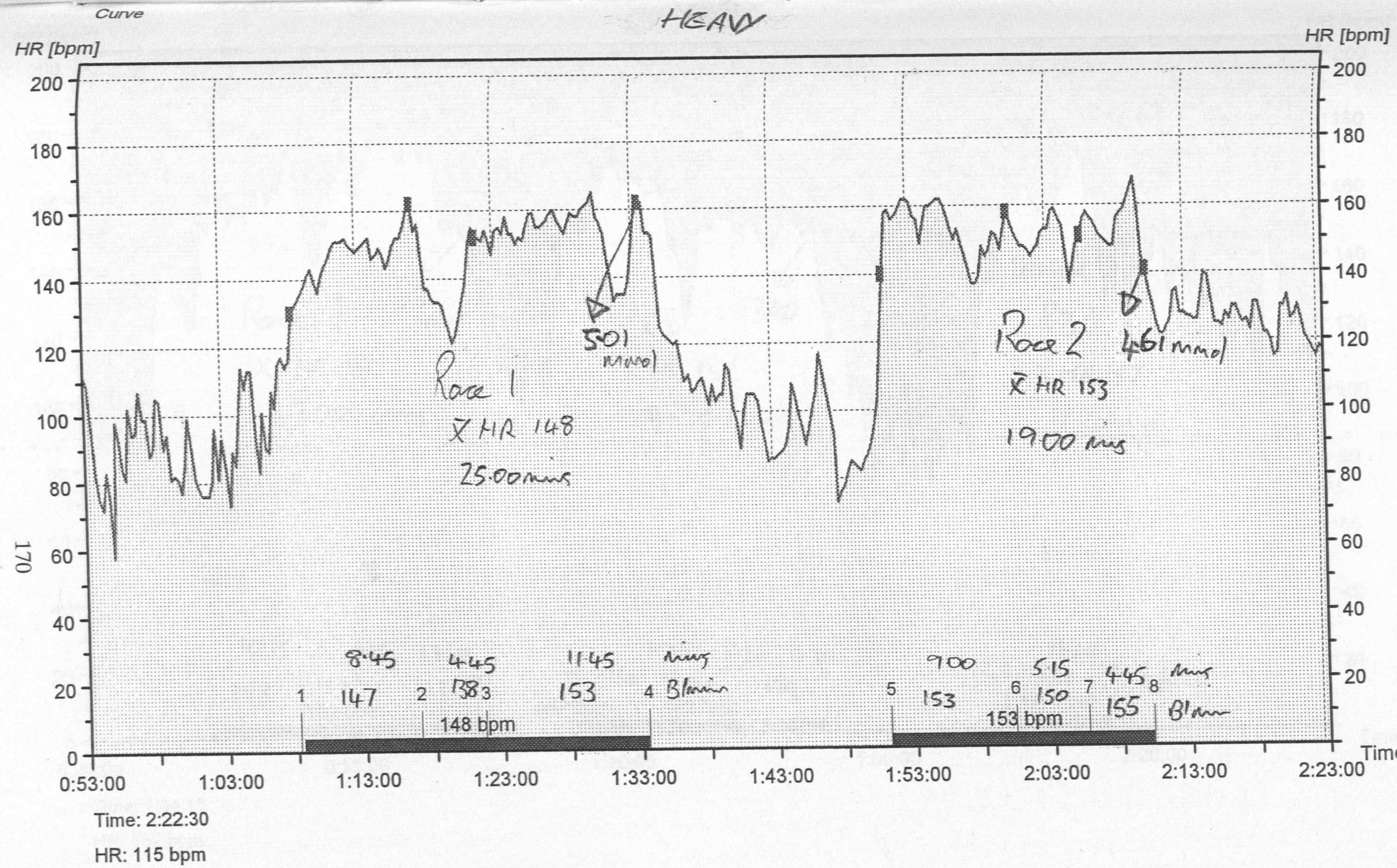


Time: 0:53:45

HR: 115 bpm

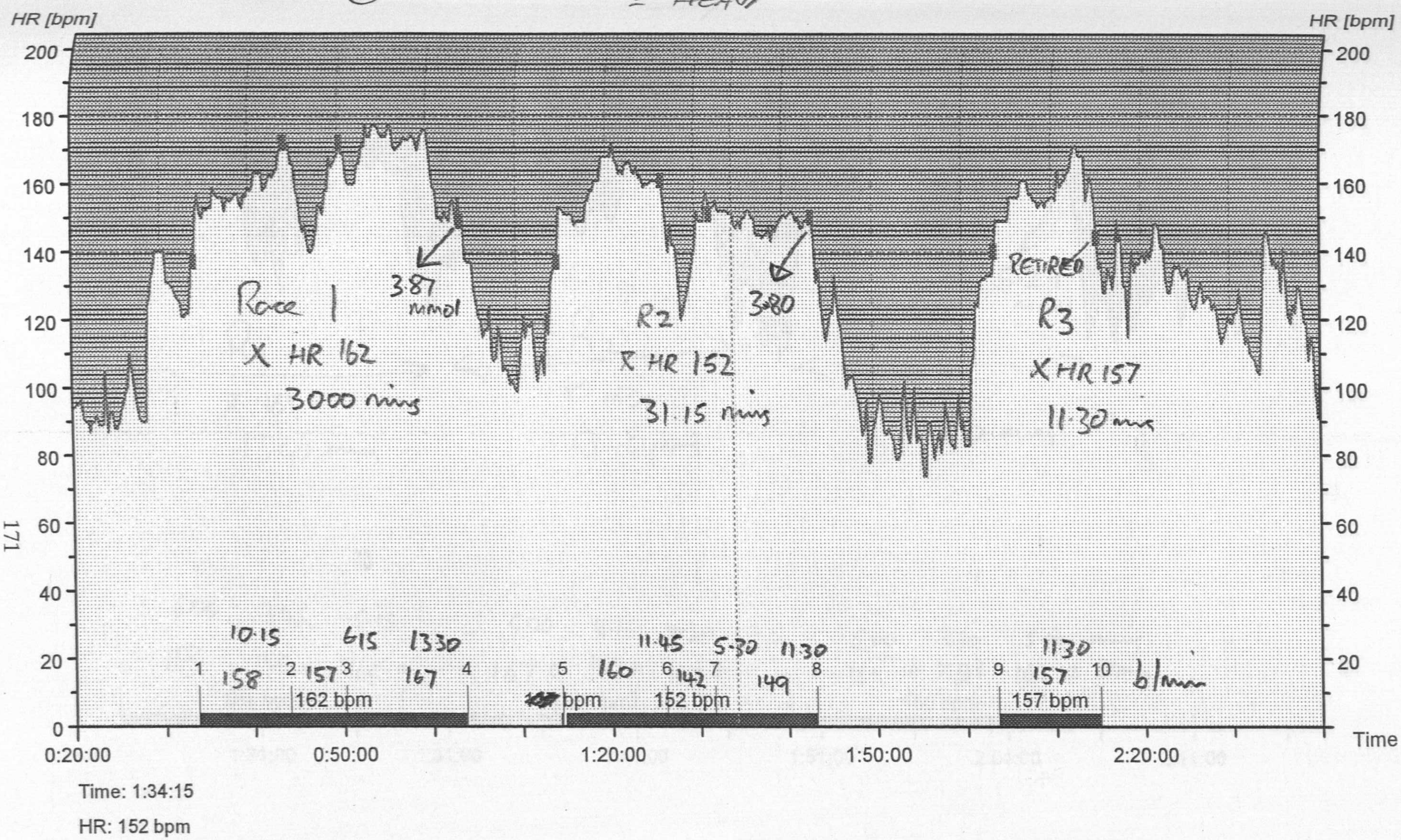
Person	SUBJECT (5)	Date	1 /12/1993	Heart rate avera	144 bpm		
Exercise	11-12	Time	09:57:43	Heart rate max	165 bpm		
Sport		Duration	2:50:00.0				
Note	Hayling 15-20 knots, Sat 11/12/93, short windward/leew			Selection	0:53:45 - 2:02:45 (0:39:00.0)		

HEAVY



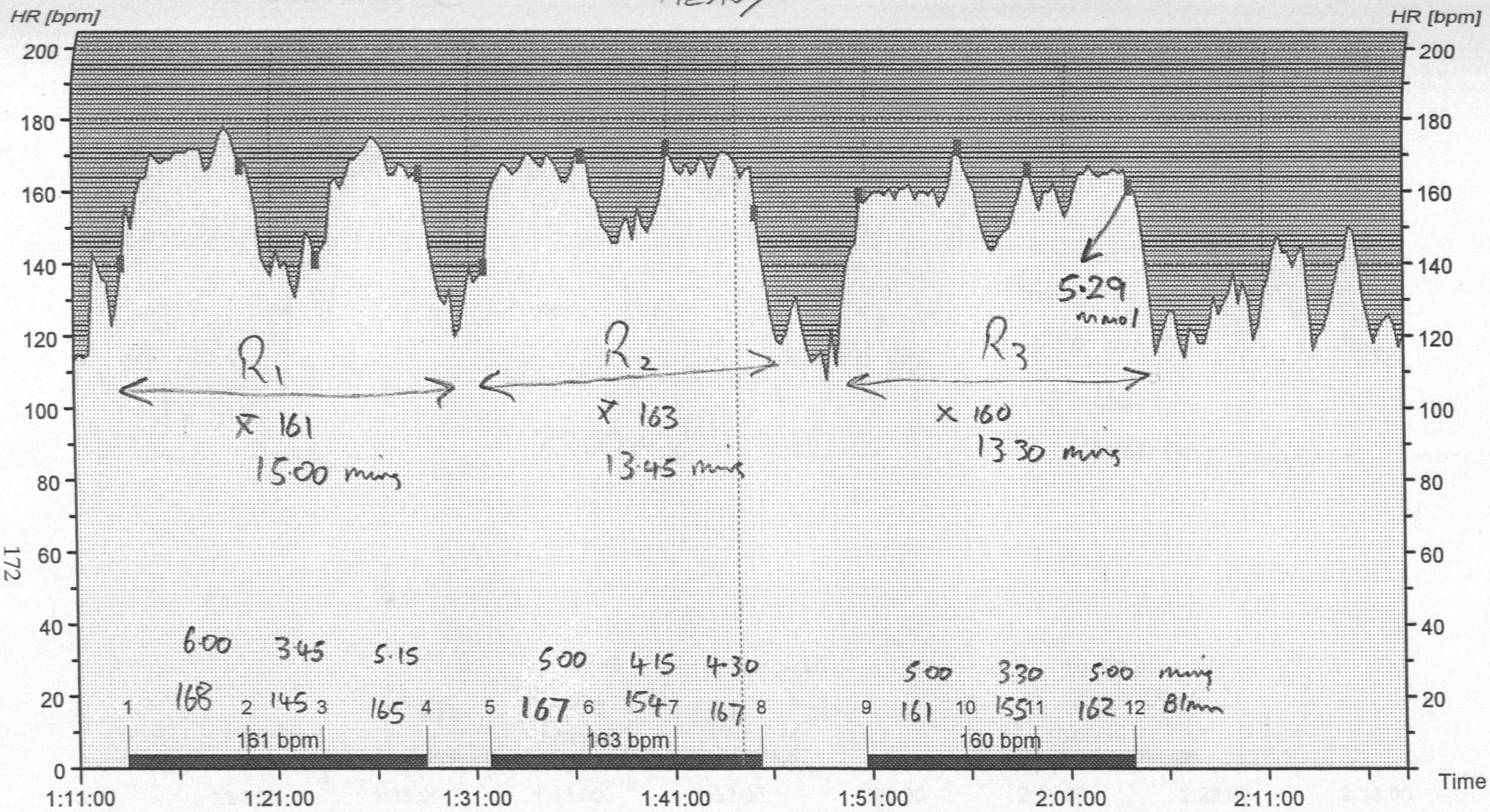
Person	SUBJECT 5	Date	1 /12/1993	Heart rate avera	150 bpm		
Exercise	-12-12	Time	09:28:14	Heart rate max	168 bpm		
Sport		Duration	3:44:00.0				
Note	Hayling 20-25 knots, Sun 12/12/93. windward/leeward/\			Selection	1:08:30 - 2:10:15 (0:44:00.0)		

curve SUBJECT 6 = HEAVY



Person	SUBJECT 6	Date	20/11/1994	Heart rate avera	157 bpm		
Exercise	20-11	Time	09:38:55	Heart rate max	177 bpm		
Sport		Duration	3:36:30.0				
Note	Weymouth 20/11/94. 15-18 knots, windward/leeward/wind			Selection	0:33:45 - 2:15:00 (1:10:15.0)		

SUBJECT 7 = HEAVY

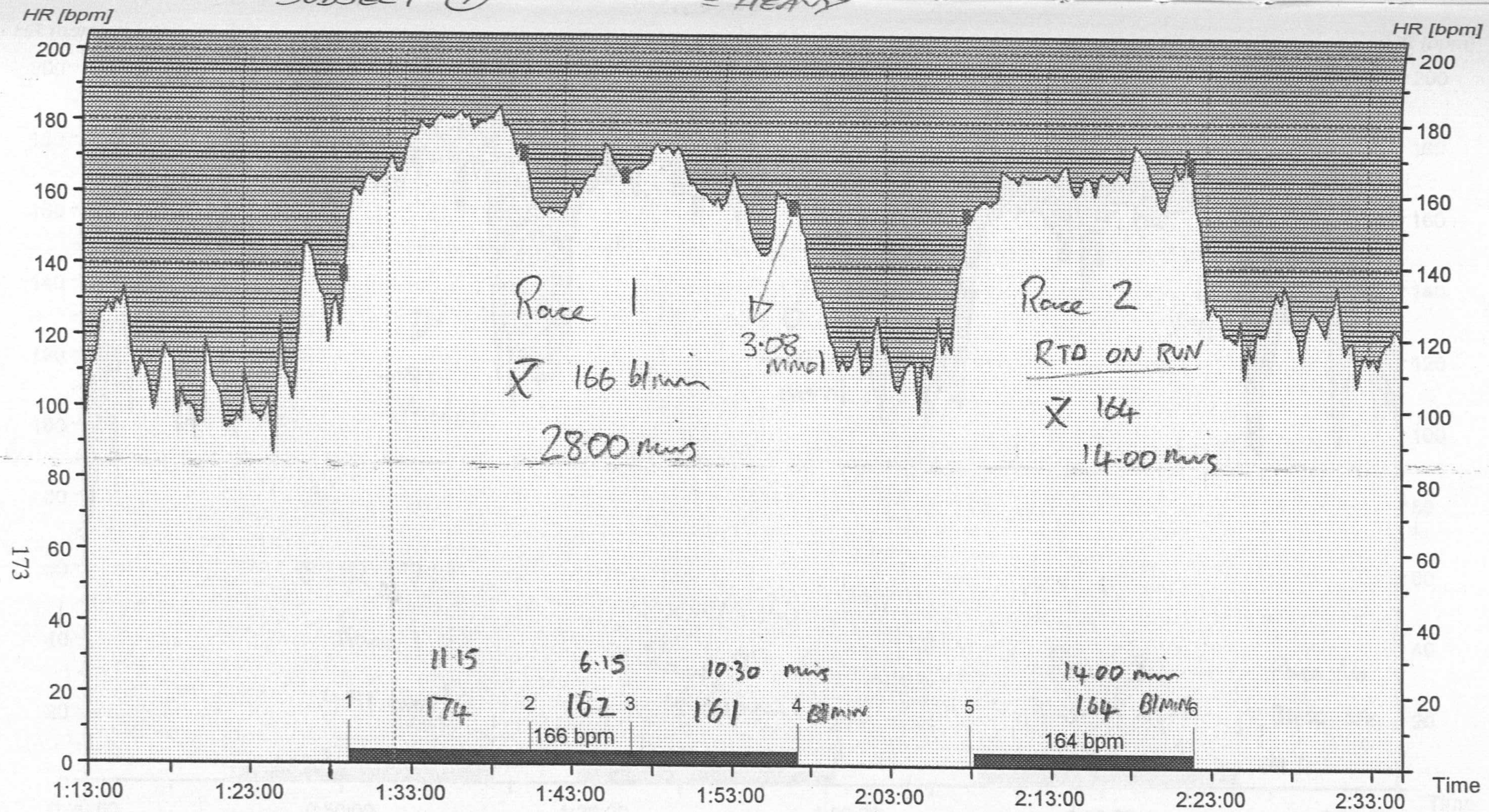


Time: 1:44:30

HR: 168 bpm

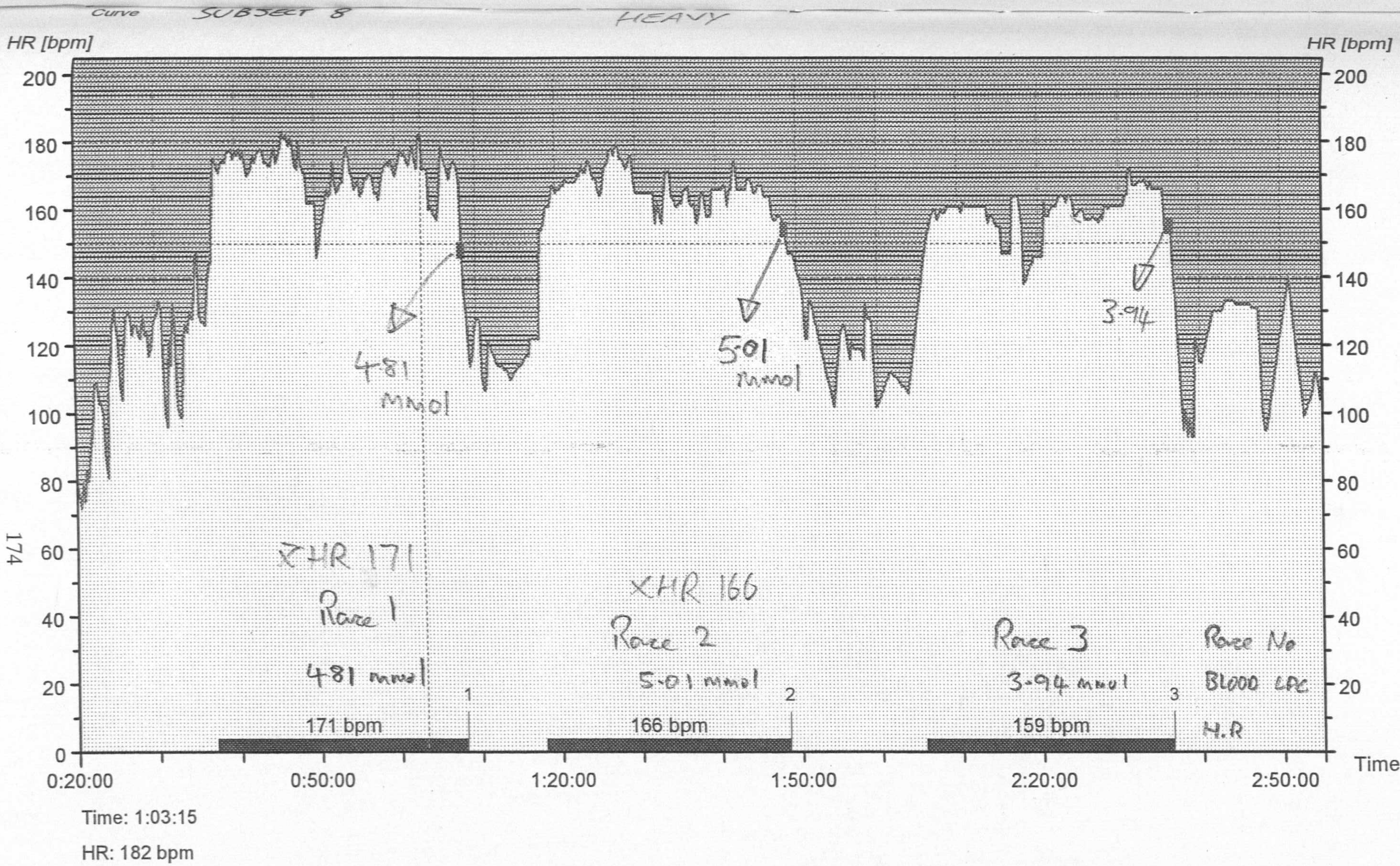
Person	SUB 7	Date	11/12/1993	Heart rate avera	161 bpm		
Exercise	11-12	Time	09:37:04	Heart rate max	178 bpm		
Sport		Duration	2:45:00.0				
Note	, Hayling 15-20 knots, Sat 11/12/93. short windward/leewar			Selection	1:13:30 - 2:04:15 (0:42:15.0)		

SUBJECT 7 = HEAVY

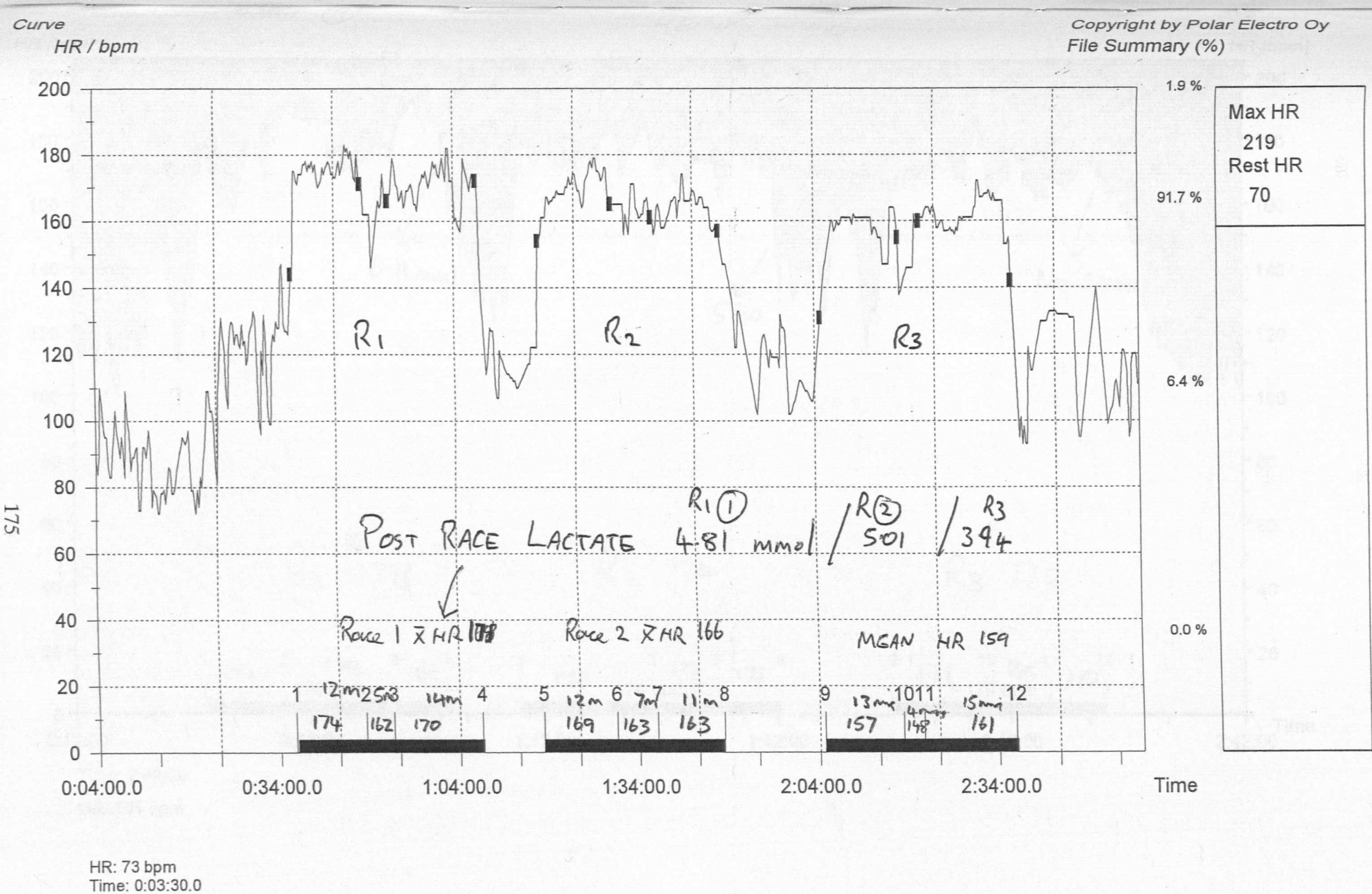


Time: 1:32:00
HR: 169 bpm

Person	SUBJECT 7	Date	12/12/1993	Heart rate avera	166 bpm		
Exercise	-12-12	Time	09:06:54	Heart rate max	184 bpm		
Sport		Duration	3:42:45.0				
Note	, Hayling 20-25 knots, Sun 12/12/93 winward/leeward/windw			Selection	1:29:15 - 2:22:00 (0:41:45.0)		

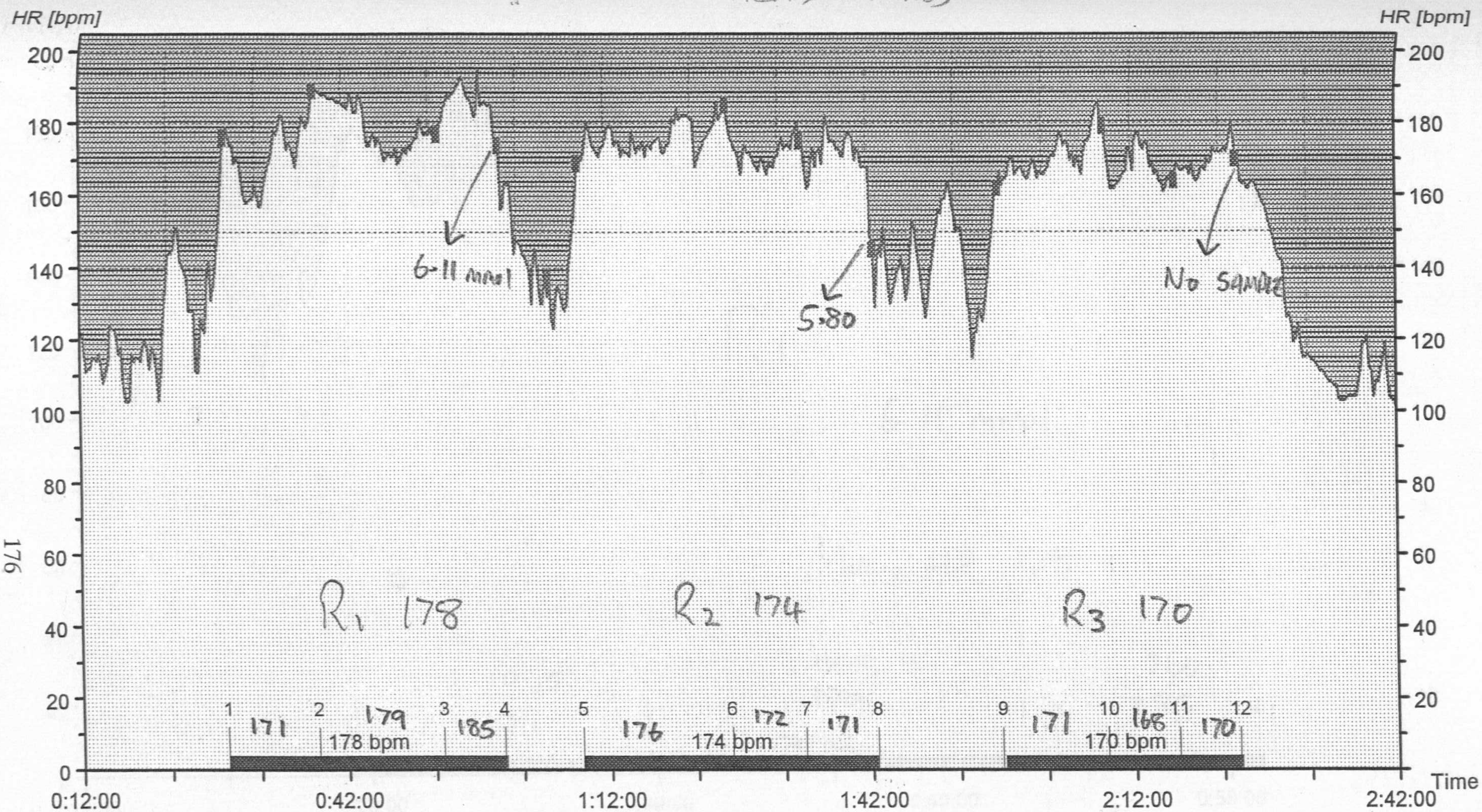


Person	SUBJECT 8	Date	20/11/1994	Heart rate avera	165 bpm	Limits 1	150 - 200
Exercise	20-11	Time	09:35:33	Heart rate max	183 bpm	Limits 2	150 - 200
Sport		Duration	3:27:45.0				
Note	Upwind/downwind/upwind. Racing Weymouth, 20/11/94. Lactates 4.81,			Selection	0:37:00 - 2:36:30 (1:32:45.0)		



Person	SUBJECT 8	**Date**	20/11/1994	**Average**	164 bpm	**Recovery**	-24 bpm
Exercise		**Time**	09:35:33.0	Duration of exercise: 3:28:10.0			
				Selected period: 0:37:00.0 - 2:37:00.0 (1:33:15.0)			

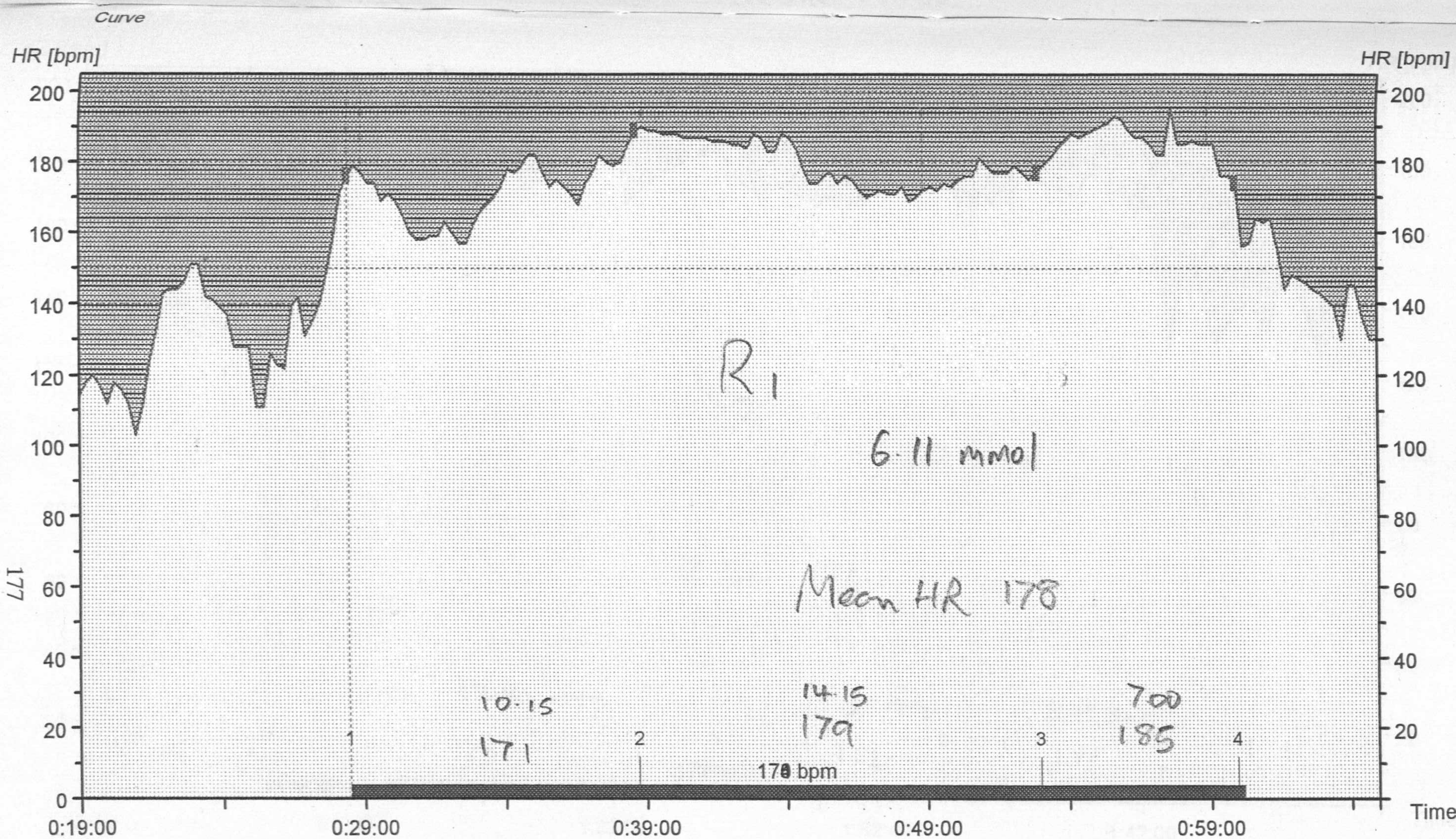
Curve SUBJECT 9 = HEAVY WINDS



Time: 2:42:00

HR: 101 bpm

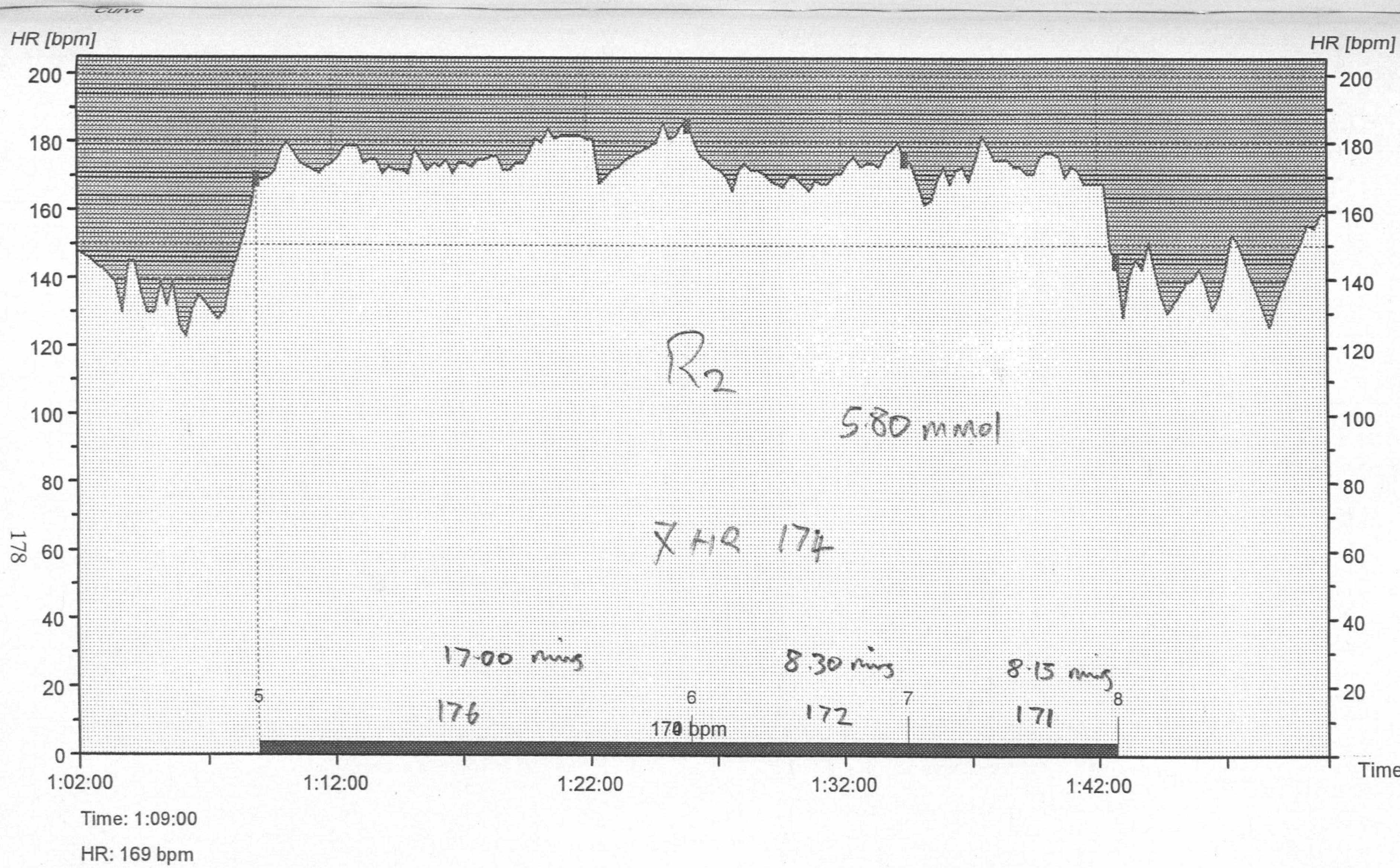
Person	SUBJECT 9	Date	20/11/1994	Heart rate avera	174 bpm	Limits 1	150 - 200
Exercise	2011	Time	09:44:25	Heart rate max	195 bpm	Limits 2	150 - 200
Sport		Duration	3:04:30.0				
Note				Selection	0:28:30 - 2:24:15 (1:32:30.0)		



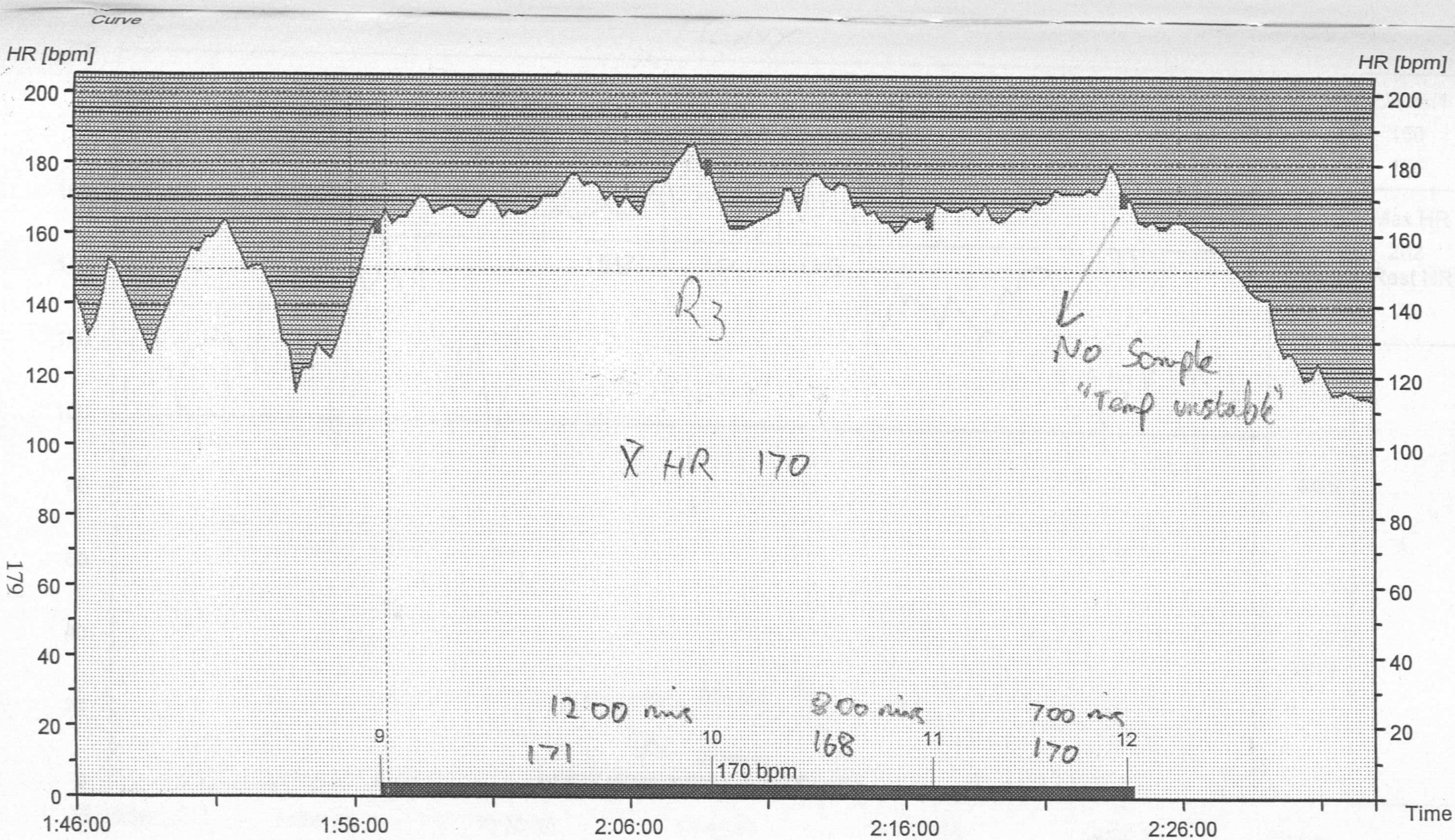
Time: 0:28:30

HR: 176 bpm

Person	SUBJECT 9	Date	20/11/1994	Heart rate avera	174 bpm	Limits 1	150 - 200
Exercise	2011	Time	09:44:25	Heart rate max	195 bpm	Limits 2	150 - 200
Sport		Duration	3:04:30.0				
Note				Selection	0:28:30 - 2:24:15 (1:32:30.0)		



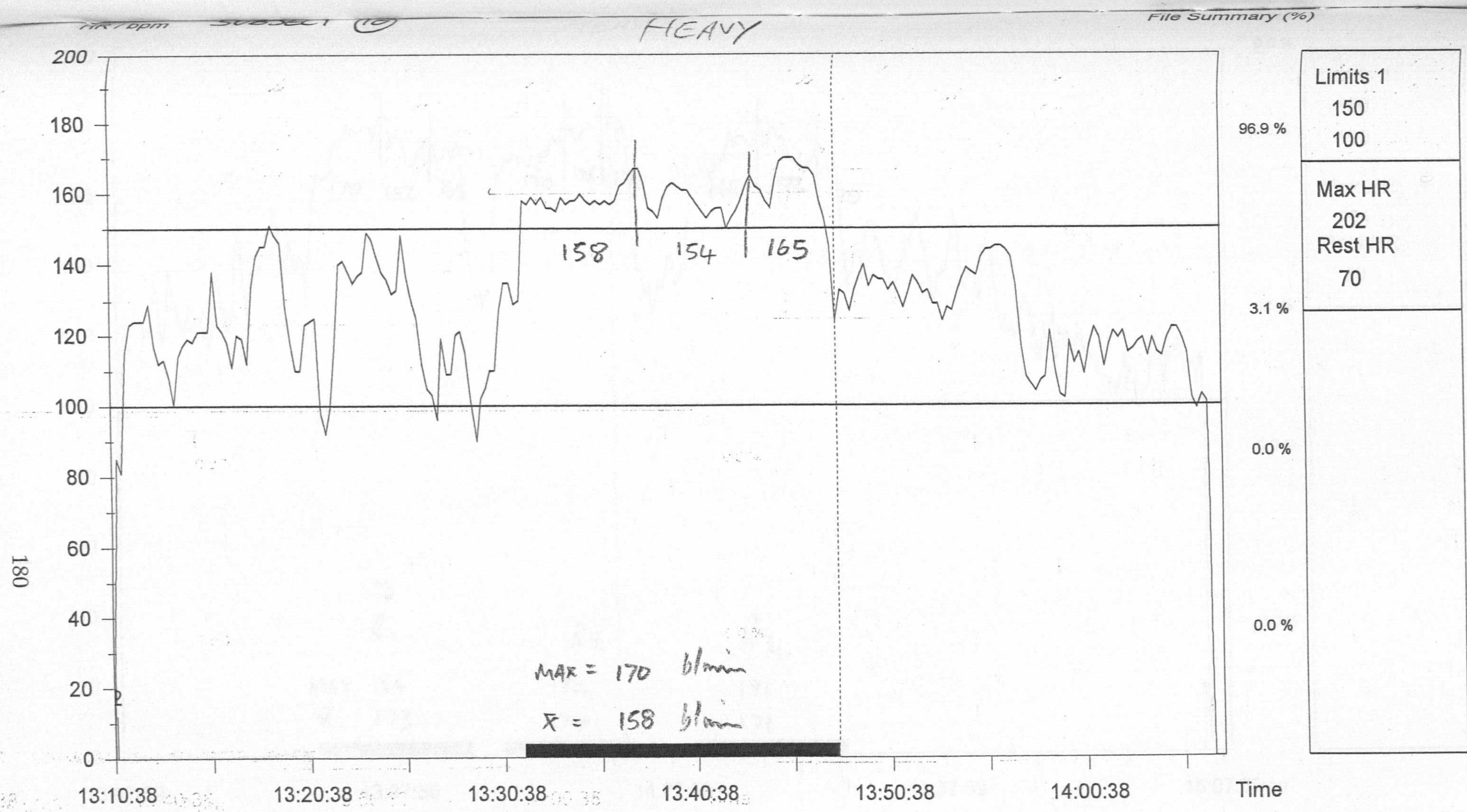
Person	SUBJECT 9	Date	20/11/1994	Heart rate avera	174 bpm	Limits 1	150 - 200
Exercise	2011	Time	09:44:25	Heart rate max	195 bpm	Limits 2	150 - 200
Sport		Duration	3:04:30.0				
Note				Selection	0:28:30 - 2:24:15 (1:32:30.0)		



Time: 1:57:15

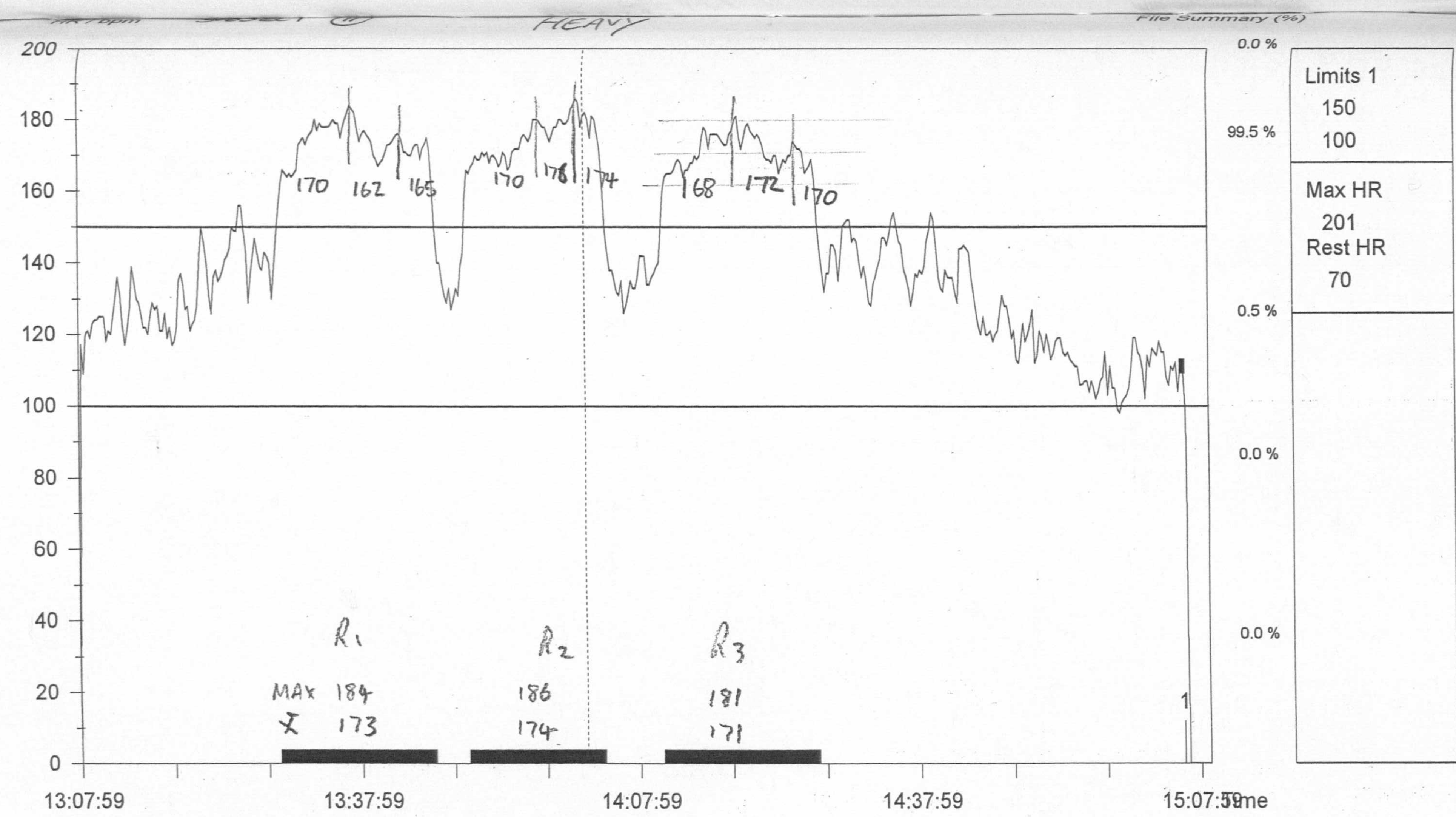
HR: 167 bpm

Person	SUBJECT 9	Date	20/11/1994	Heart rate avera	174 bpm	Limits 1	150 - 200
Exercise	2011	Time	09:44:25	Heart rate max	195 bpm	Limits 2	150 - 200
Sport		Duration	3:04:30.0				
Note				Selection	0:28:30 - 2:24:15 (1:32:45.0)		



HR: 124 bpm
Time: 13:47:53

Person	SUBJECT 10	Date	05/12/2001	Average	158 bpm	Recovery	6 bpm
Exercise	2001/12/05 13:10:38 15s	Time	13:10:38.0	Duration of exercise: 3:13:41.7			
Note	Wednesday Weymouth 20+ knots - racing			Selected period: 13:31:38 - 13:47:53 (0:16:15.0)			

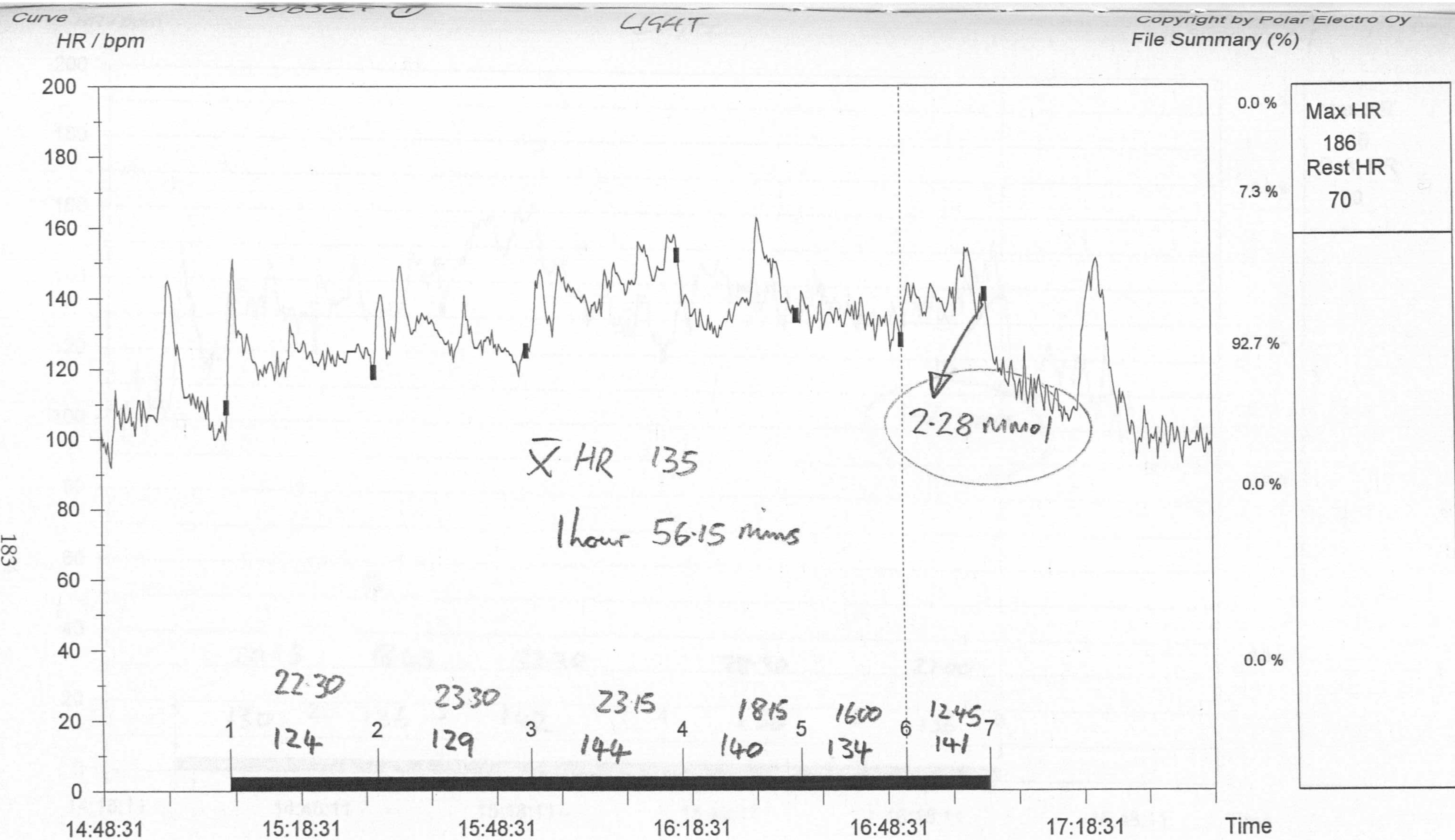


HR: 181 bpm
Time: 14:02:14

Person	SUBJECT 11	Date	05/12/2001	Average	172 bpm	Recovery	-13 bpm
Exercise		Time	13:07:59.0	Duration of exercise: 4:28:41.8			
Note	Wednesday W'mouth 20 knots + Mean HR 172			Selected period: 13:29:14 - 14:27:14 (0:48:15.0)			

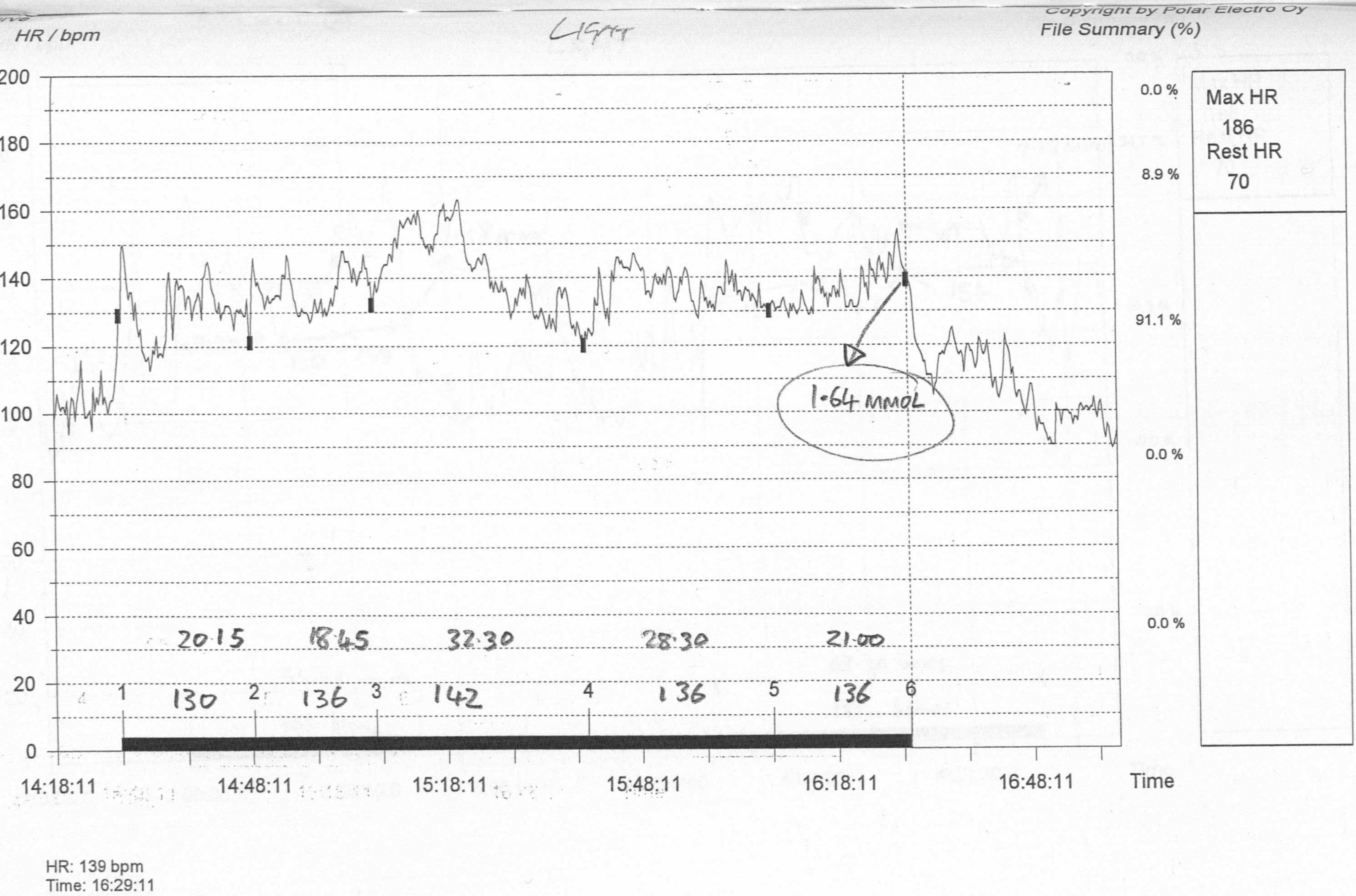
Chapter 4: On-water measures of single-handed dinghy sailing.

Light wind data for Finn sailing.

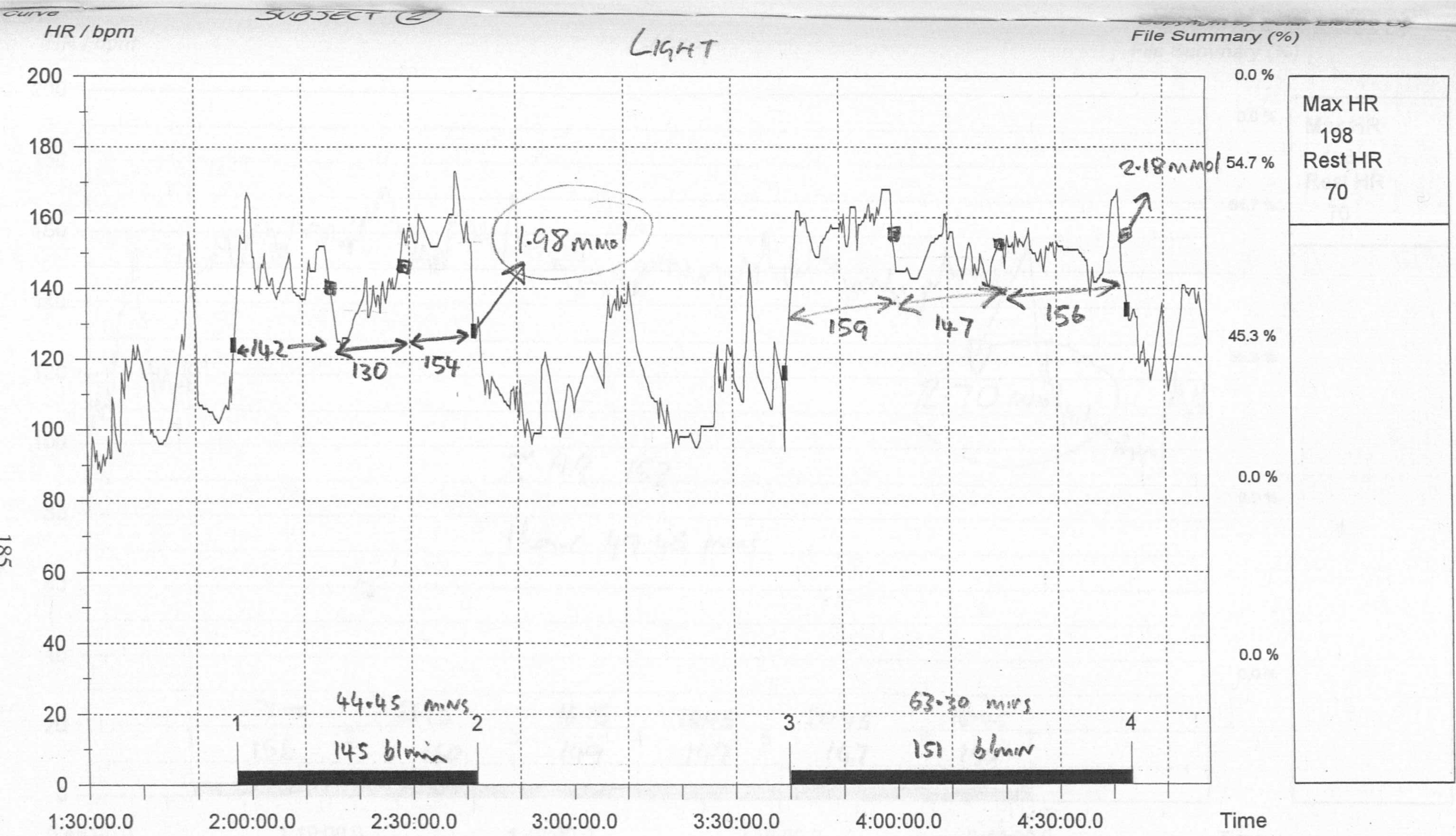


HR: 128 bpm
Time: 16:51:16

Person	SUBJECT ①	Date	19/08/1998	Average	135 bpm	Recovery	-32 bpm
Exercise		Time	13:44:31.0	Duration of exercise: 4:25:41.5			
Note	Finn Worlds - Athens 17-23 August 1998. 5-6 knots			Selected period: 15:07:46 - 17:04:01 (1:56:15.0)			

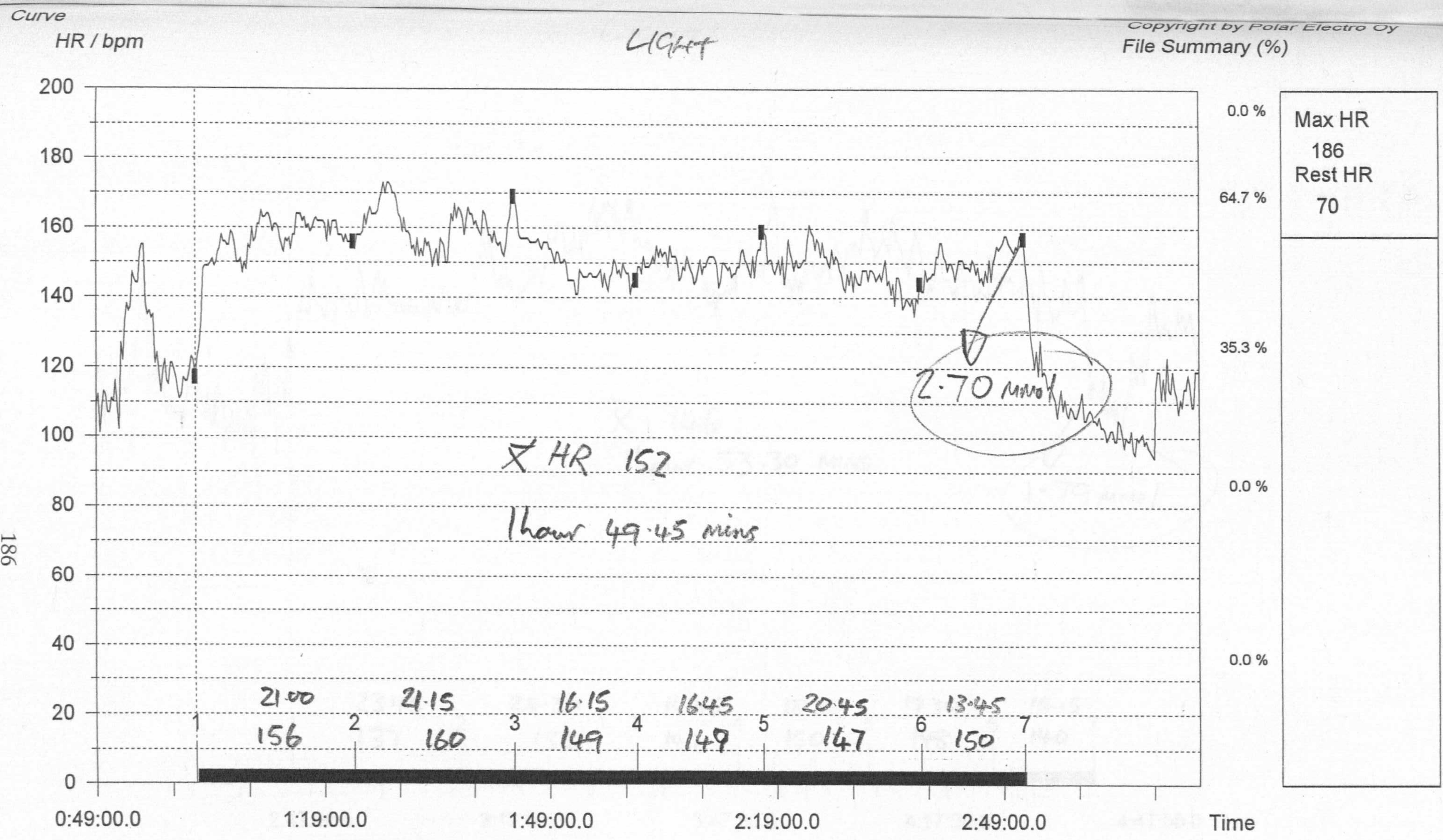


Person	SUBJECT 1	Date	20/08/1998	Average	136 bpm	Recovery	-22 bpm
Exercise		Time	13:27:11.0	Duration of exercise: 3:48:32.4			
Note	Finn Worlds - Athens - 17-23 August 1998 light winds			Selected period: 14:27:56 - 16:29:11 (2:01:15.0)			



HR: 103 bpm
Time: 1:29:45.0

Person	SUBJECT 2	Date	21/04/1998	Average	149 bpm	Recovery	-4 bpm
Exercise		Time	10:28:29.0	Duration of exercise: 5:58:39.8			
Note	Le Hyeres, Tuesday 21/4/98. race 5 (5 knots), race 6 (9 k)			Selected period: 1:57:15.0 - 4:43:30.0 (1:48:15.0)			



HR: 117 bpm
Time: 1:02:00.0

Person	SUBJECT 2	Date	19/08/1998	Average	152 bpm	Recovery	-27 bpm
Exercise		Time	23:37:34.0	Duration of exercise: 4:30:45.7			
Note	Finn Worlds Athens - 17-23 August 1998 light winds			Selected period: 1:02:15.0 - 2:52:00.0 (1:49:45.0)			

Curve

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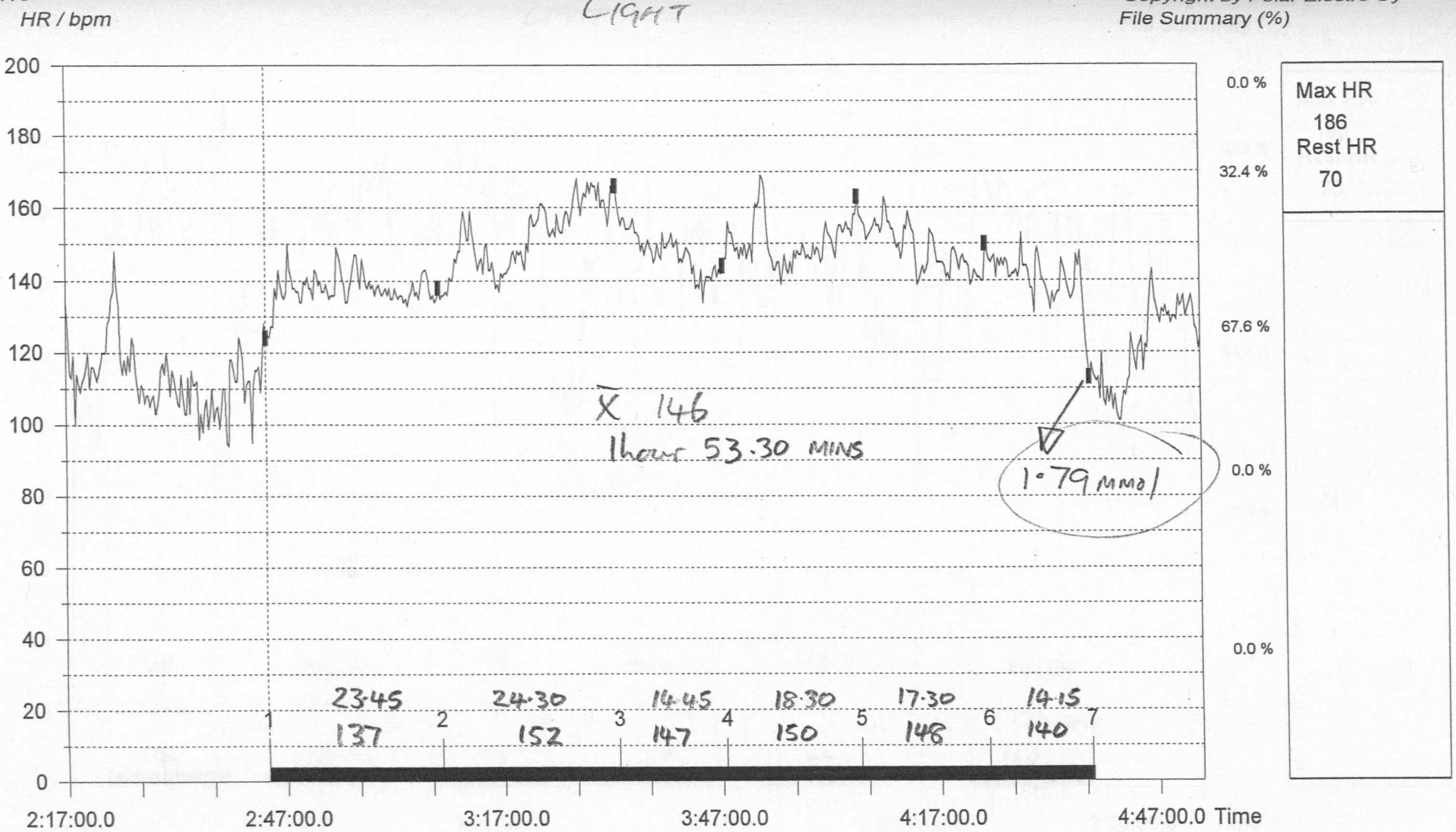
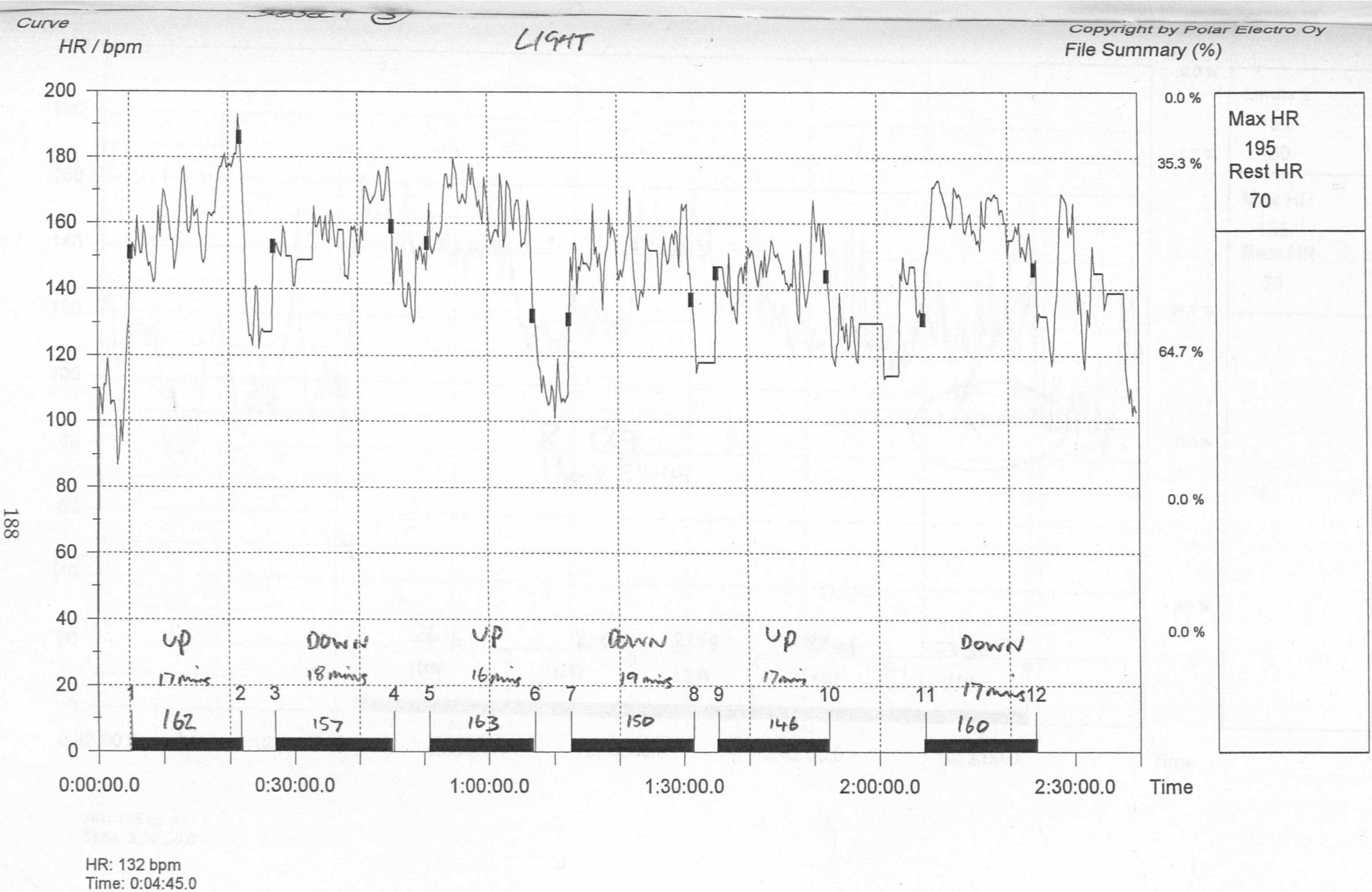


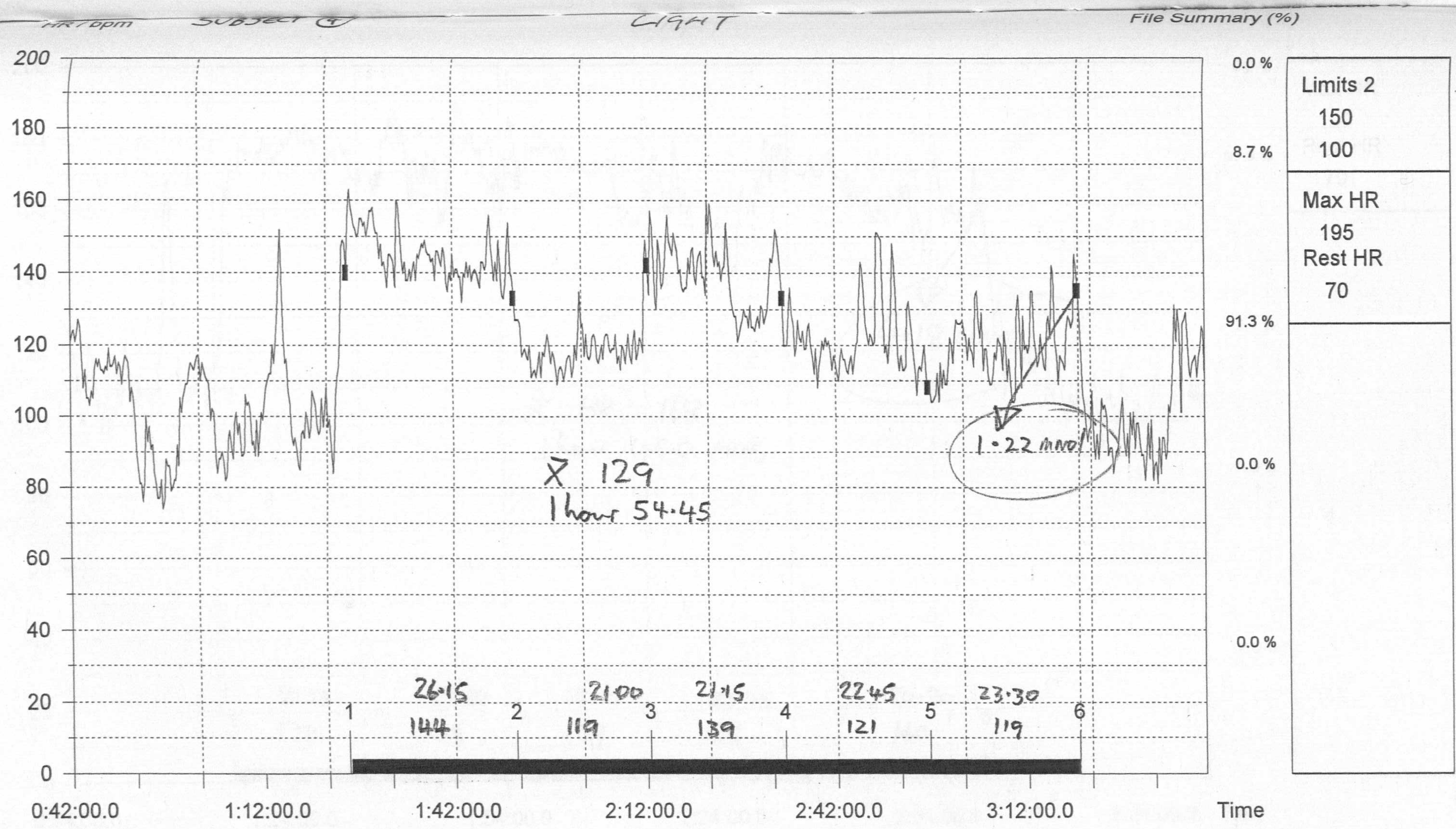
HR: 124 bpm
Time: 2:44:30.0

Person	SUBJECT 2	Date	22/08/1998	Average	146 bpm	Recovery	7 bpm
Exercise		Time	00:01:05.0	Duration of exercise: 5:21:51.7			
Note	Finn Worlds - Athens - 17-23 August 1998			Selected period: 2:44:30.0 - 4:38:00.0 (1:53:30.0)			



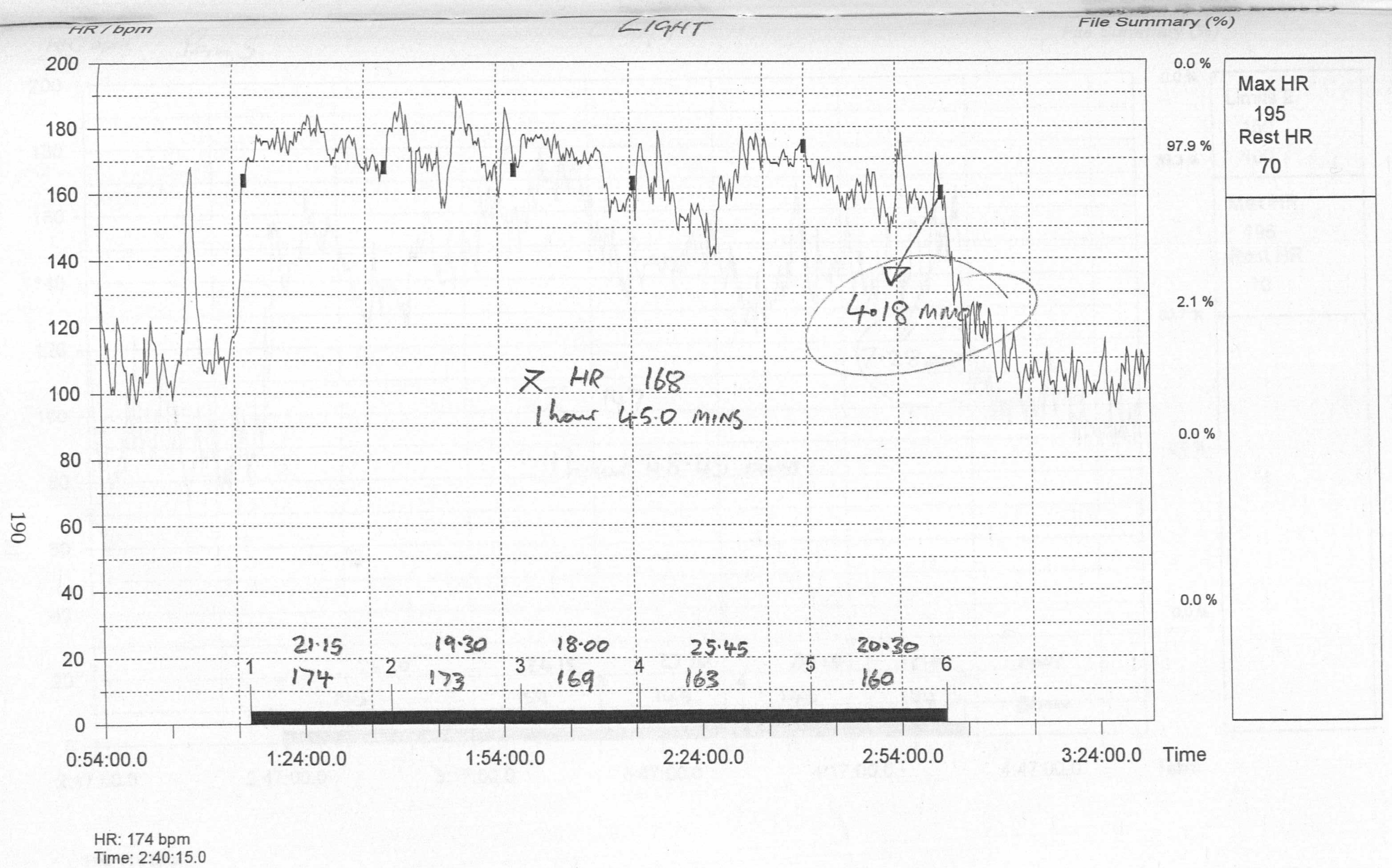
Person	SUBJECT 3	Date	04/04/2001	Average	156 bpm	Recovery	-26 bpm
Exercise		Time	14:13:26.0	Duration of exercise: 2:39:32.7			
Note	Palma ... day 3: 8-13 knots			Selected period: 0:05:00.0 - 2:24:15.0 (1:44:45.0)			

HR / bpm SUBJECT 4 LIGHT

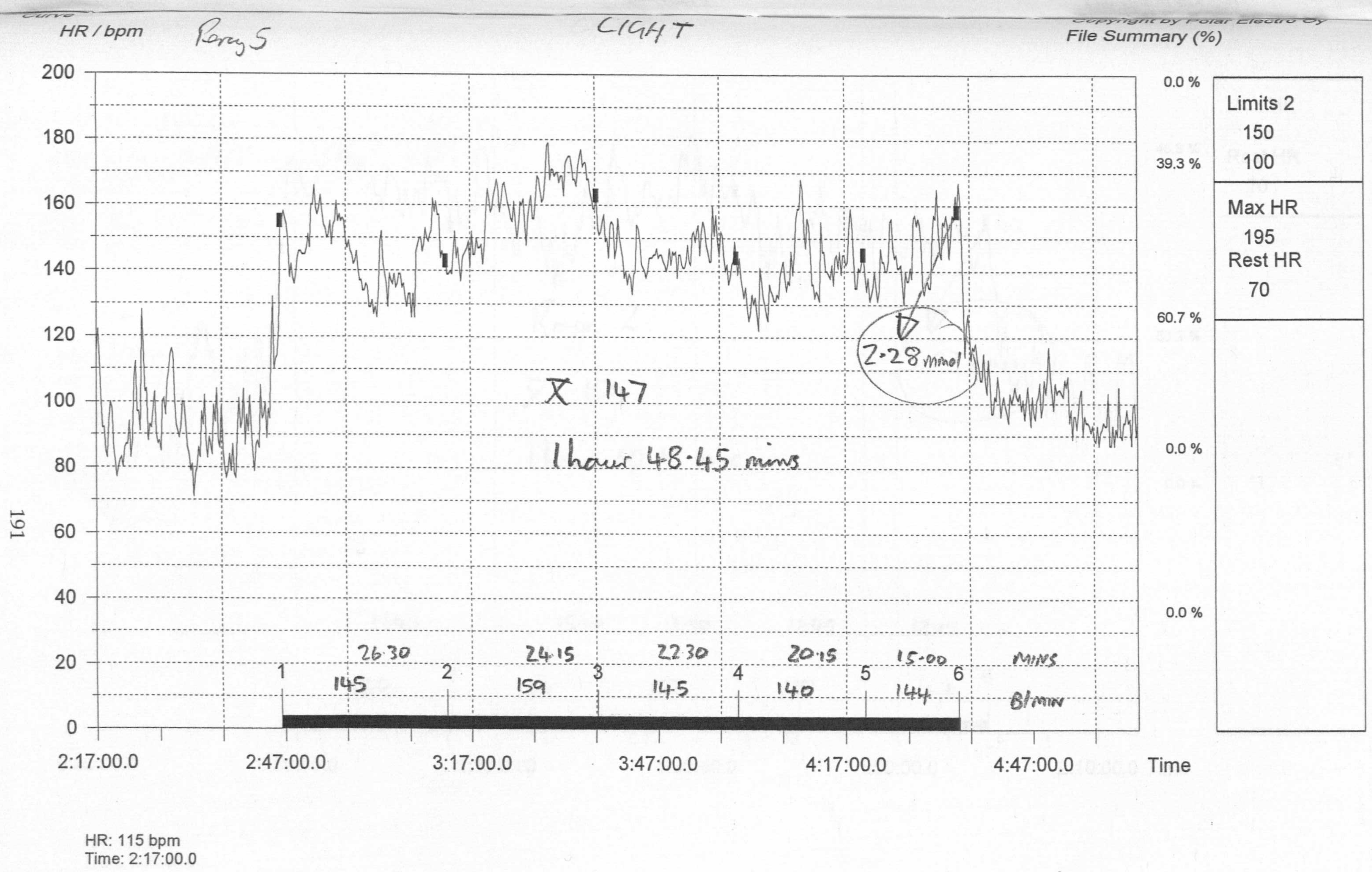


HR: 135 bpm
Time: 3:20:00.0

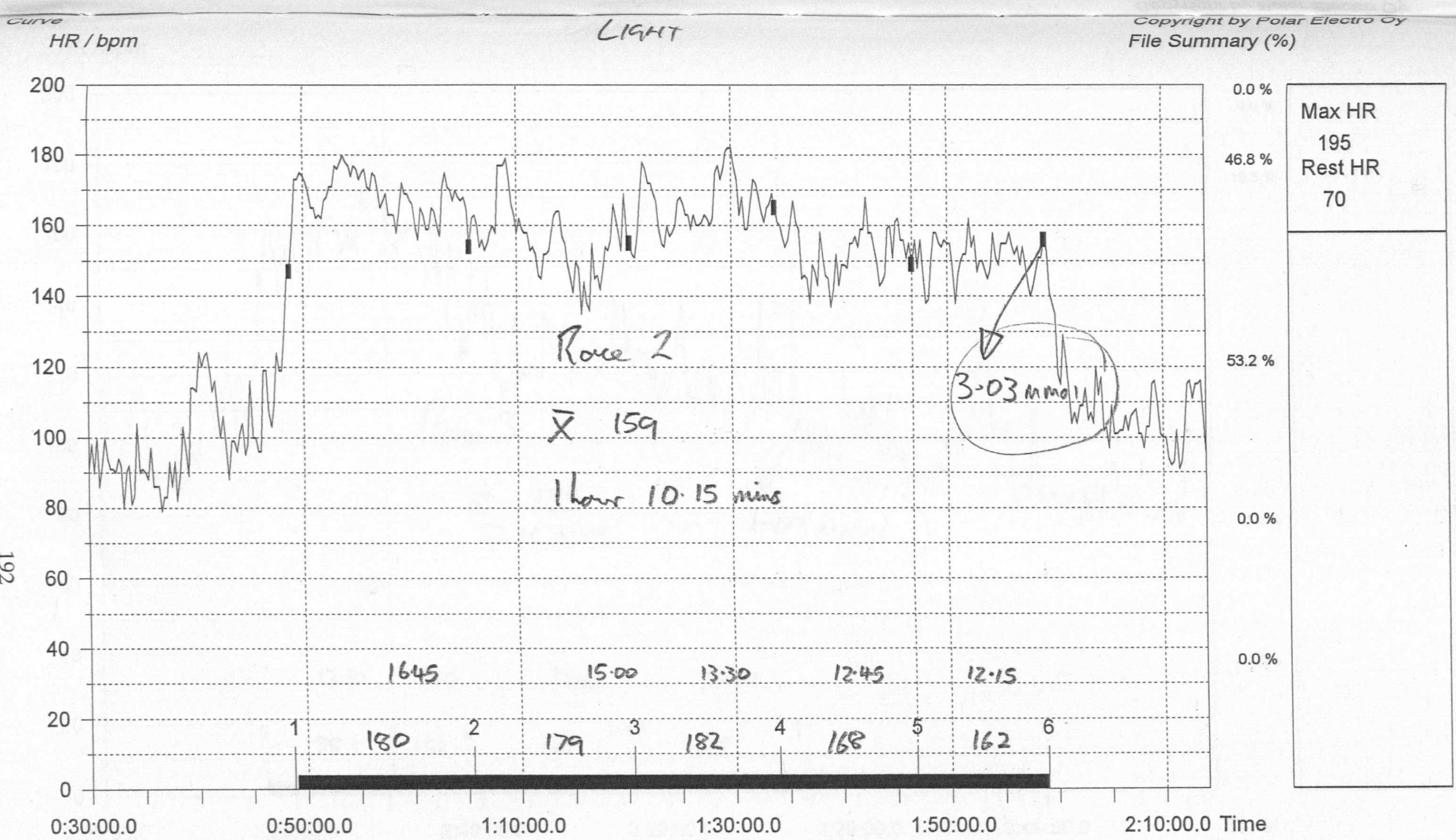
Person	SUBJECT 4	Date	19/08/1998	Average	129 bpm	Recovery	22 bpm
Exercise		Time	13:43:57.0	Duration of exercise: 4:31:46.1			
Note	Finn Worlds - Athens 17-23 August 1998 - 8-10 knots			Selected period: 1:25:30.0 - 3:20:00.0 (1:54:30.0)			



Person	SUBJECT 4	Date	20/08/1998	Average	168 bpm	Recovery	4 bpm
Exercise		Time	13:21:42.0	Duration of exercise: 3:49:04.5			
Note	Finn Worlds Greece 17-23 August 1998			Selected period: 1:15:45.0 - 3:00:45.0 (1:45:00.0)			

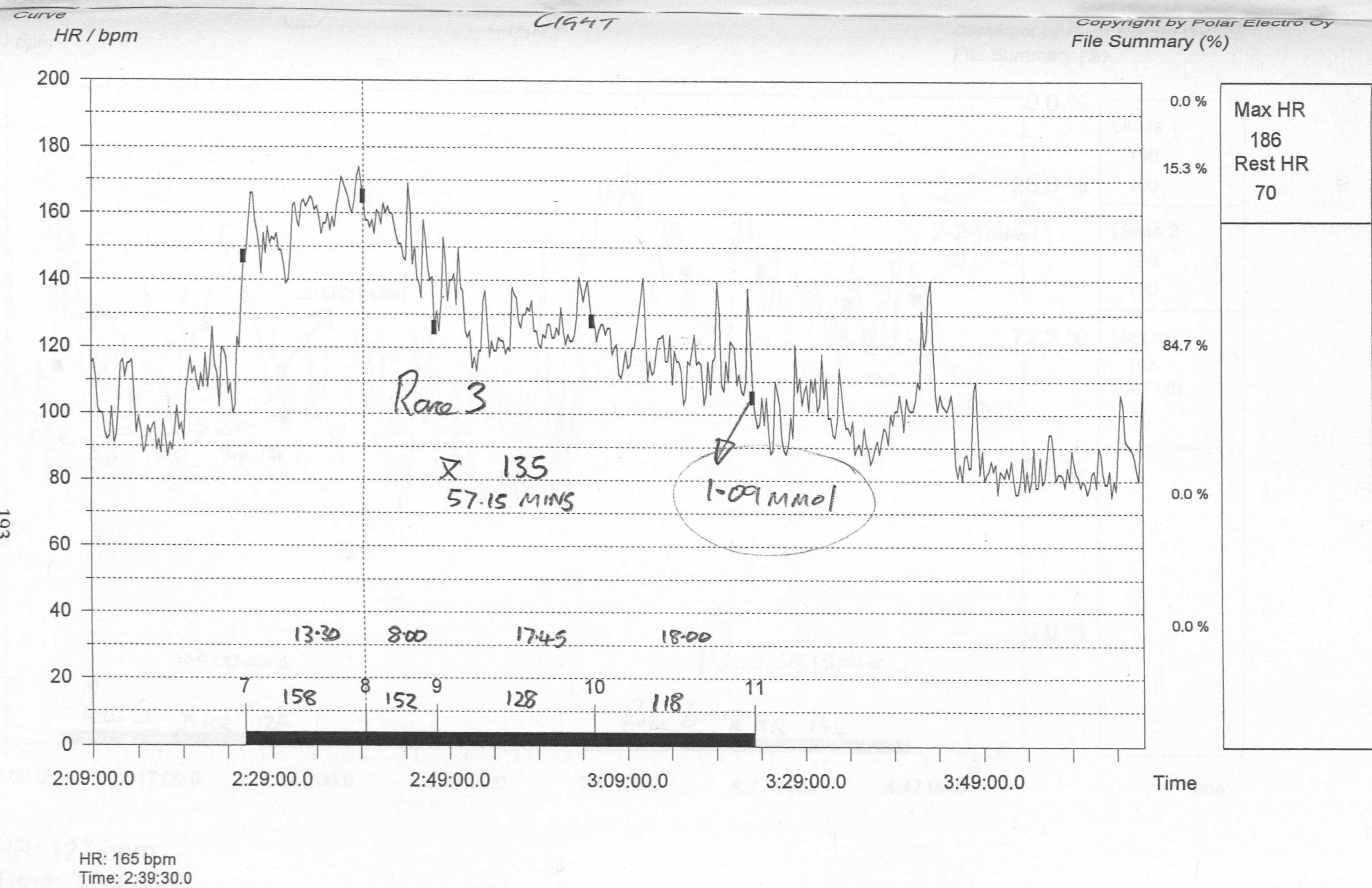


Person	SUBJECT 4	Date	22/08/1998	Average	147 bpm	Recovery	-12 bpm
Exercise		Time	13:56:36.0	Duration of exercise: 9:54:32.4			
Note	Athens Gold Cup, 22/8/98, position 5th, 6-10 knots.			Selected period: 2:46:30.0 - 4:35:15.0 (1:48:45.0)			



HR: 149 bpm
Time: 1:46:45.0

Person	SUBJECT 4	Date	26/05/2000	Average	159 bpm	Recovery	2 bpm
Exercise		Time	13:29:06.0	Duration of exercise: 4:18:08.2			
Note	Spa 2000. Race 1: 10 knots. Race 2: 5-7 knots			Selected period: 0:49:00.0 - 1:59:00.0 (1:10:00.0)			



Person	SUBJECT 4	Date	26/05/2000	Average	135 bpm	Recovery	42 bpm
Exercise		Time	13:29:06.0	Duration of exercise: 4:18:08.2			
Note	Spa 2000: Race 2: 5-7 knots & dropping			Selected period: 2:26:00.0 - 3:23:15.0 (0:57:15.0)			

Curve

SUBJECT 5

LIGHT

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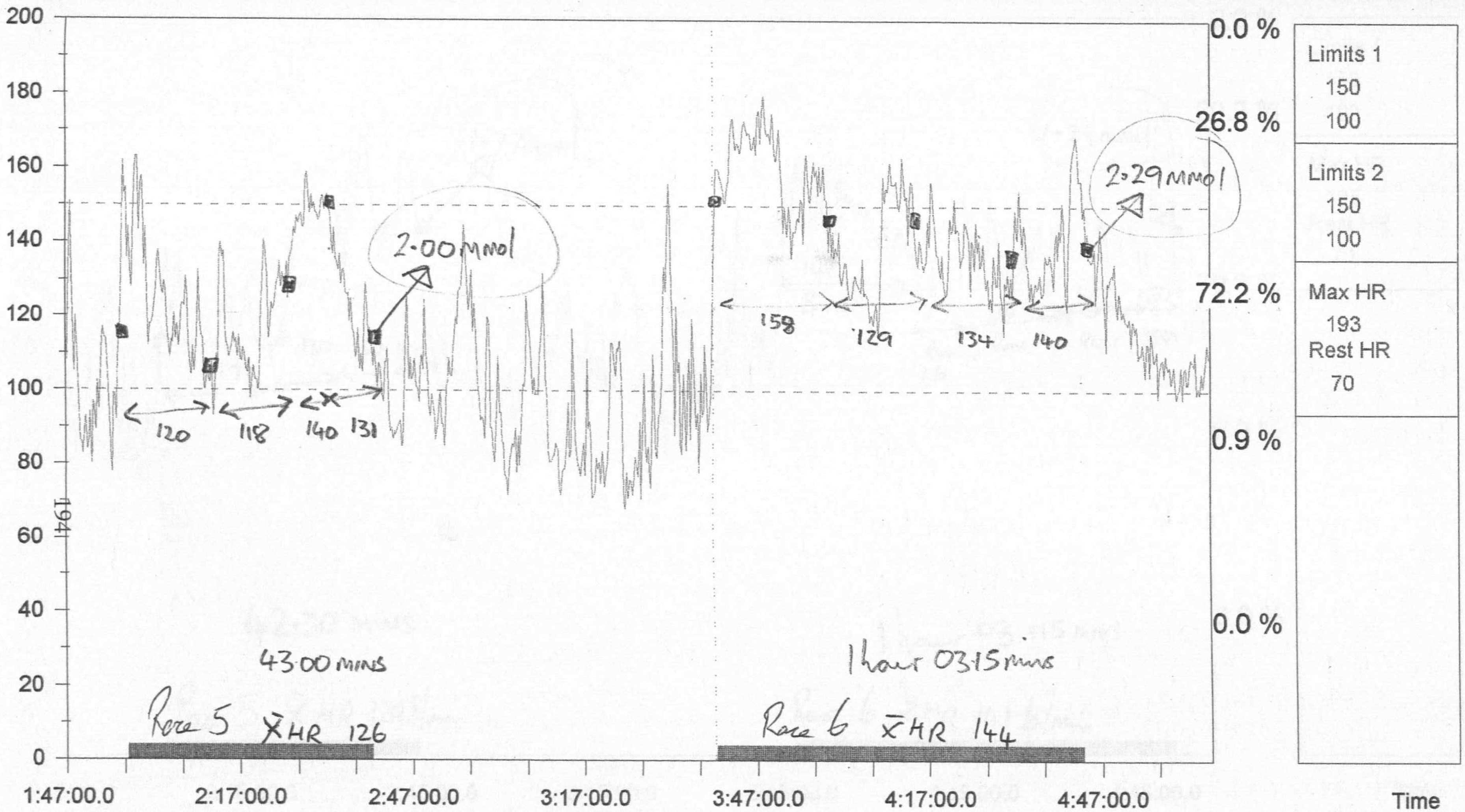


HR: 127 bpm
Time: 3:39:45.0

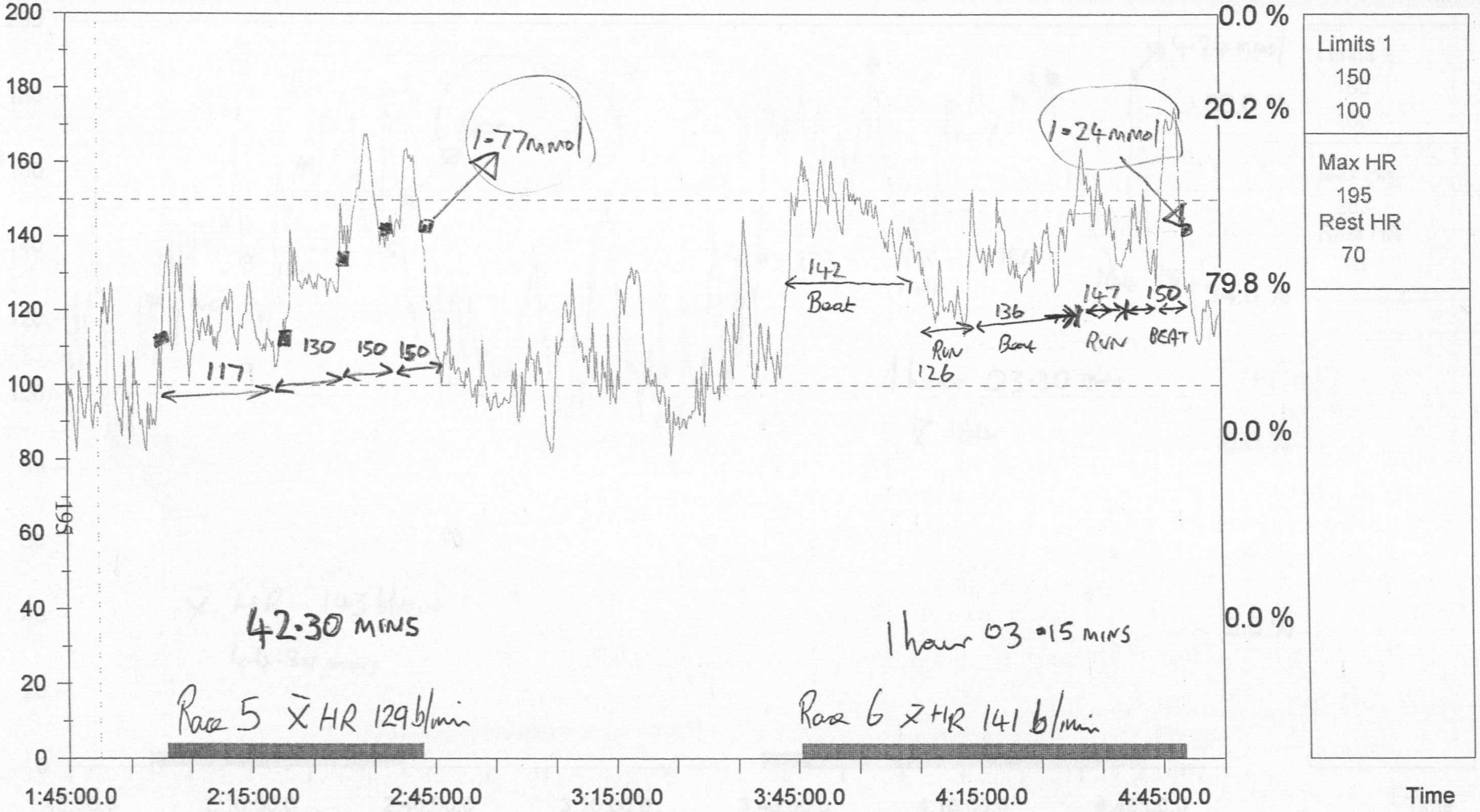
Person	SUBJECT 5	Date	04/21/1998	Average	137 bpm	Recovery	38 bpm
Exercise		Time	10:29:32.0 AM	Duration of exercise: 6:00:53.4			
Note	Le Hyeres. Tuesday 21/4/98. 5 knots, 9 knots			Selected period: 1:57:30.0 - 4:43:45.0 (1:46:15.0)			

Curve

SUBJECT 6

LIGHT

File Summary (%)



HR: 95 bpm
Time: 1:50:00.0

Person	SUBJECT 6	Date	04/21/1998	Average	136 bpm	Recovery	-25 bpm
Exercise		Time	10:25:01.0 AM	Duration of exercise: 6:01:08.7			
Note	Le Hyeres.Tuesday 21/4/98. Races 5 & 6 (5 knots - 9 knots).			Selected period: 2:01:00.0 - 4:48:45.0 (1:45:15.0)			

Curve SUBJECT 7 LIGHT

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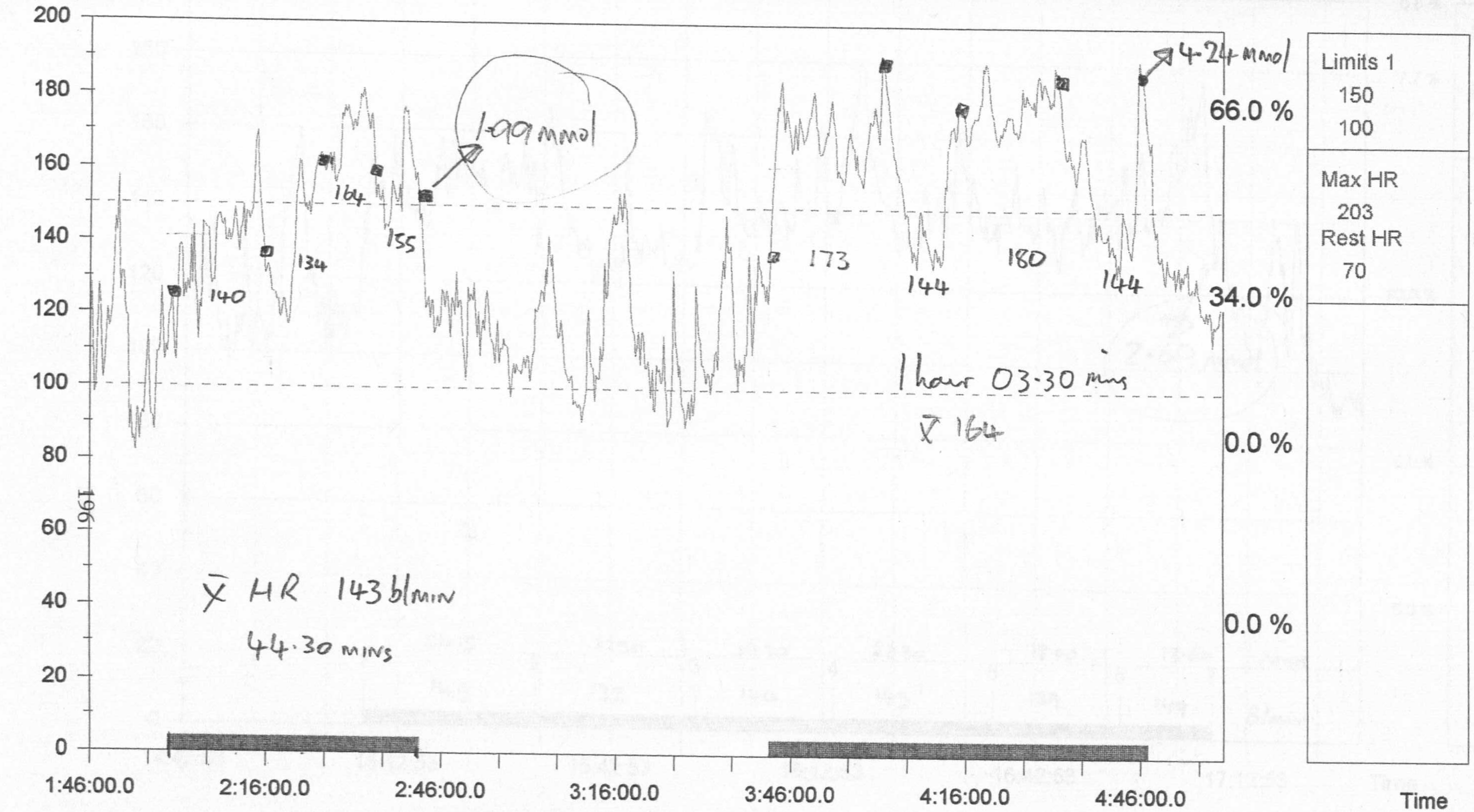
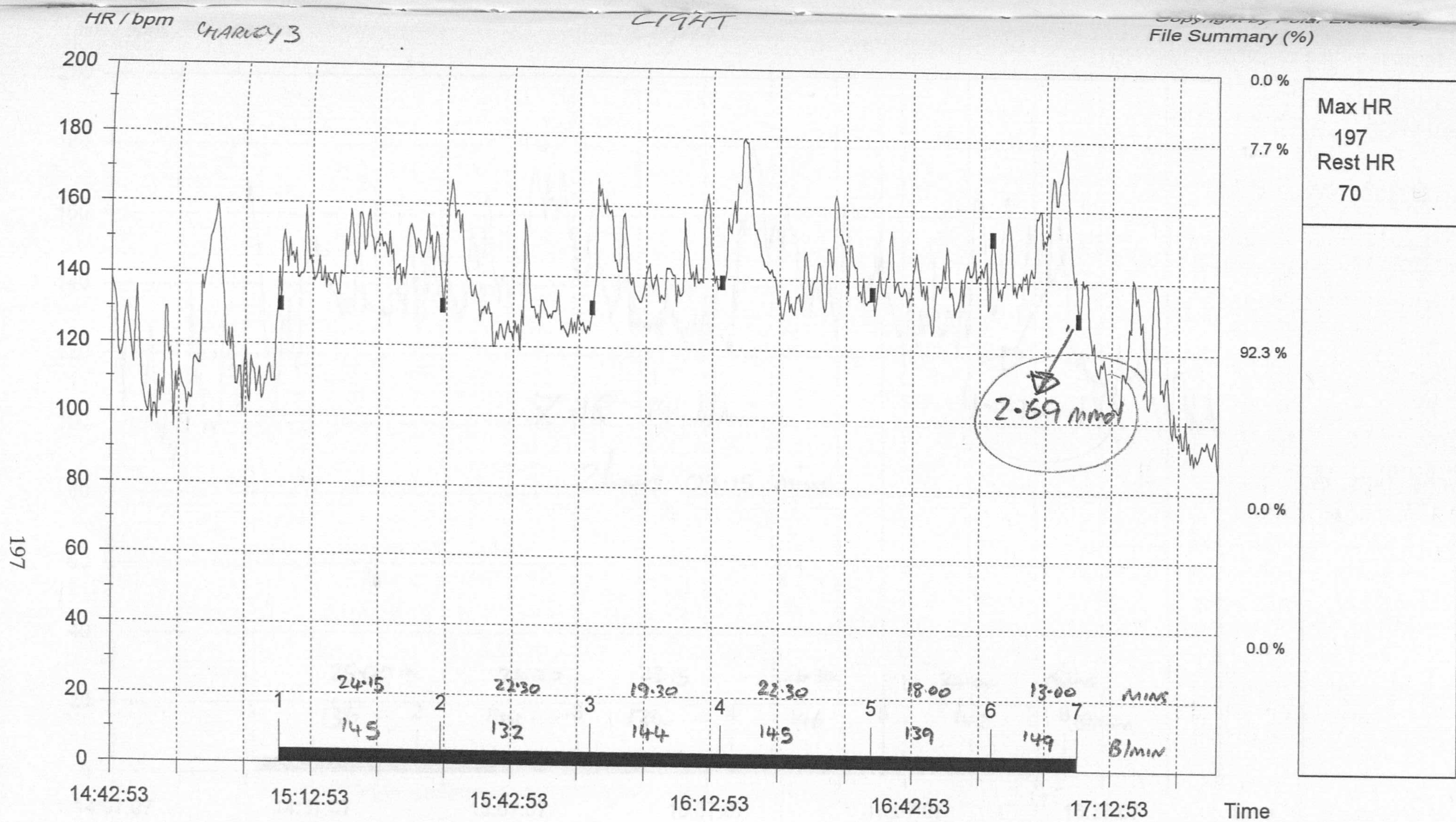
File Summary (%)



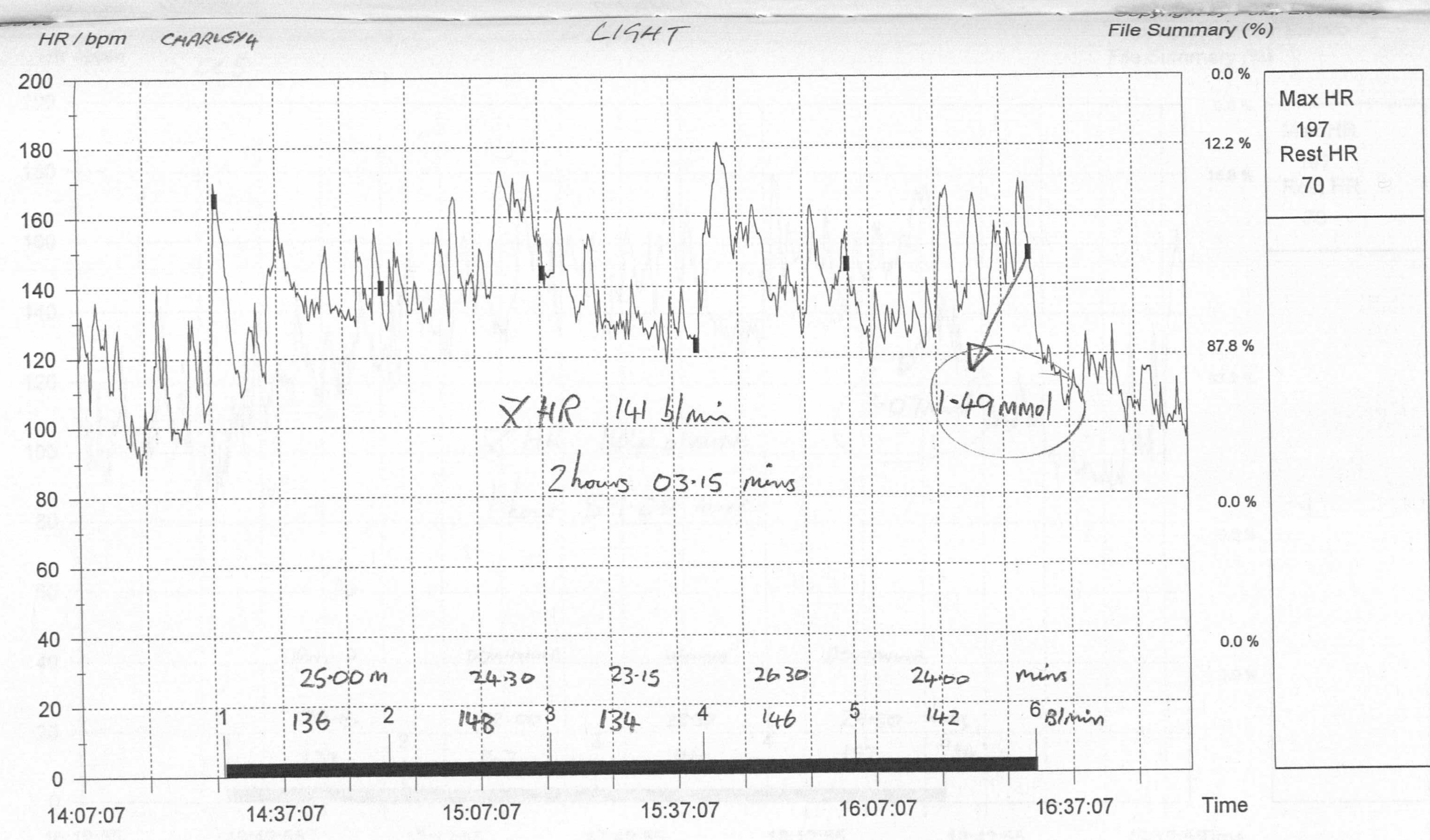
HR: 110 bpm
Time: 1:45:30.0

Person	SUBJECT 7	Date	04/21/1998	Average	158 bpm	Recovery	-43 bpm
Exercise	1998/04/21 10:26:38 AM 15s	Time	10:26:38.0 AM	Duration of exercise: 5:54:40.5			
Note	Le Hyeres 21/4/98. Races 5 & 6 (5 knots, 9 knots)			Selected period: 1:59:15.0 - 4:47:15.0 (1:48:00.0)			



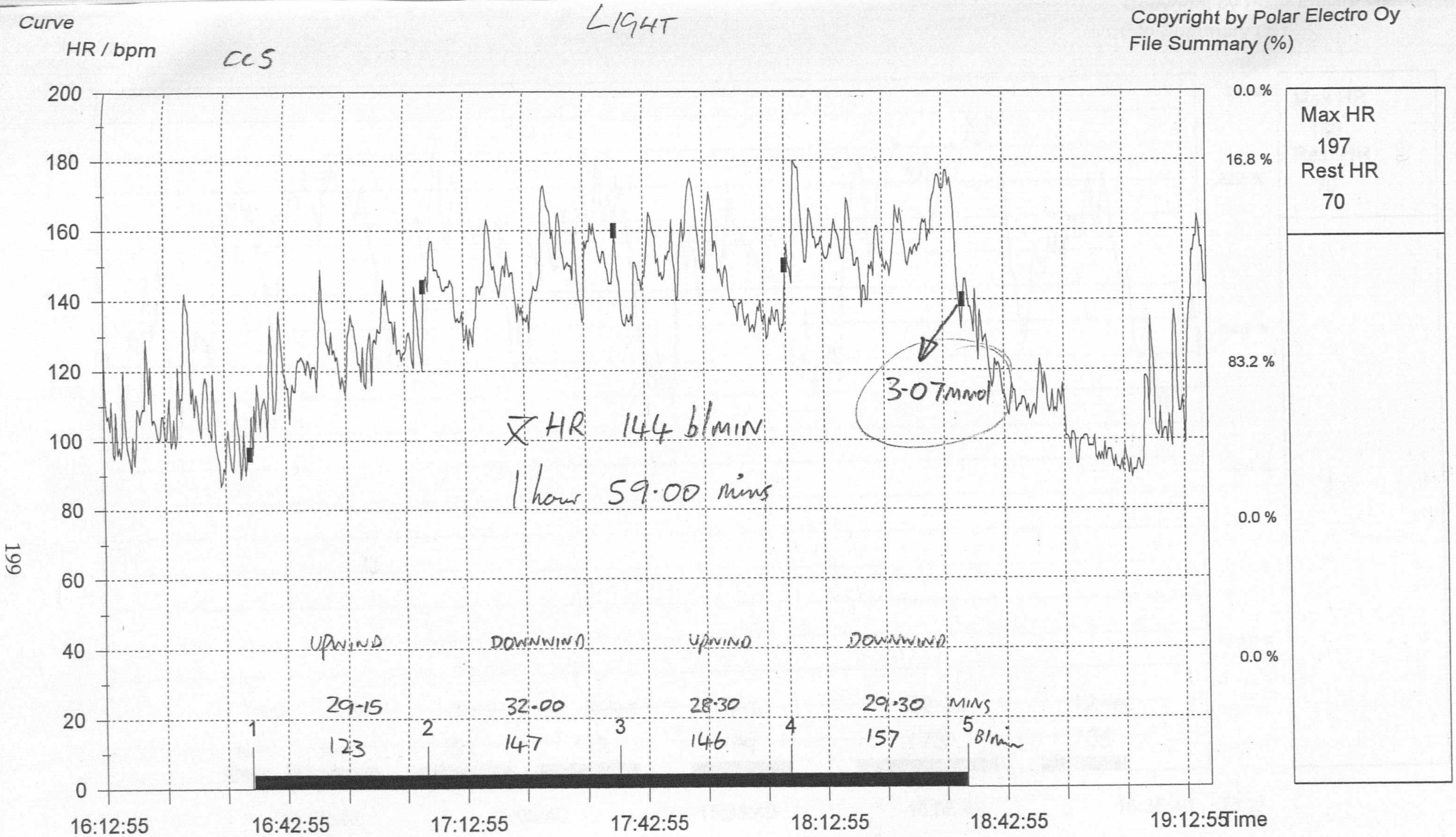
HR: 122 bpm
Time: 15:42:53

Person	SUBJECT 7	Date	19/08/1998	Average	142 bpm	Recovery	2 bpm
Exercise		Time	13:44:53.0	Duration of exercise: 4:24:34.4			
Note	Finn Worlds Athens light winds 8-10 knots 17-23.8.98			Selected period: 15:08:08 - 17:07:53 (1:59:45.0)			



HR: 146 bpm
Time: 16:03:52

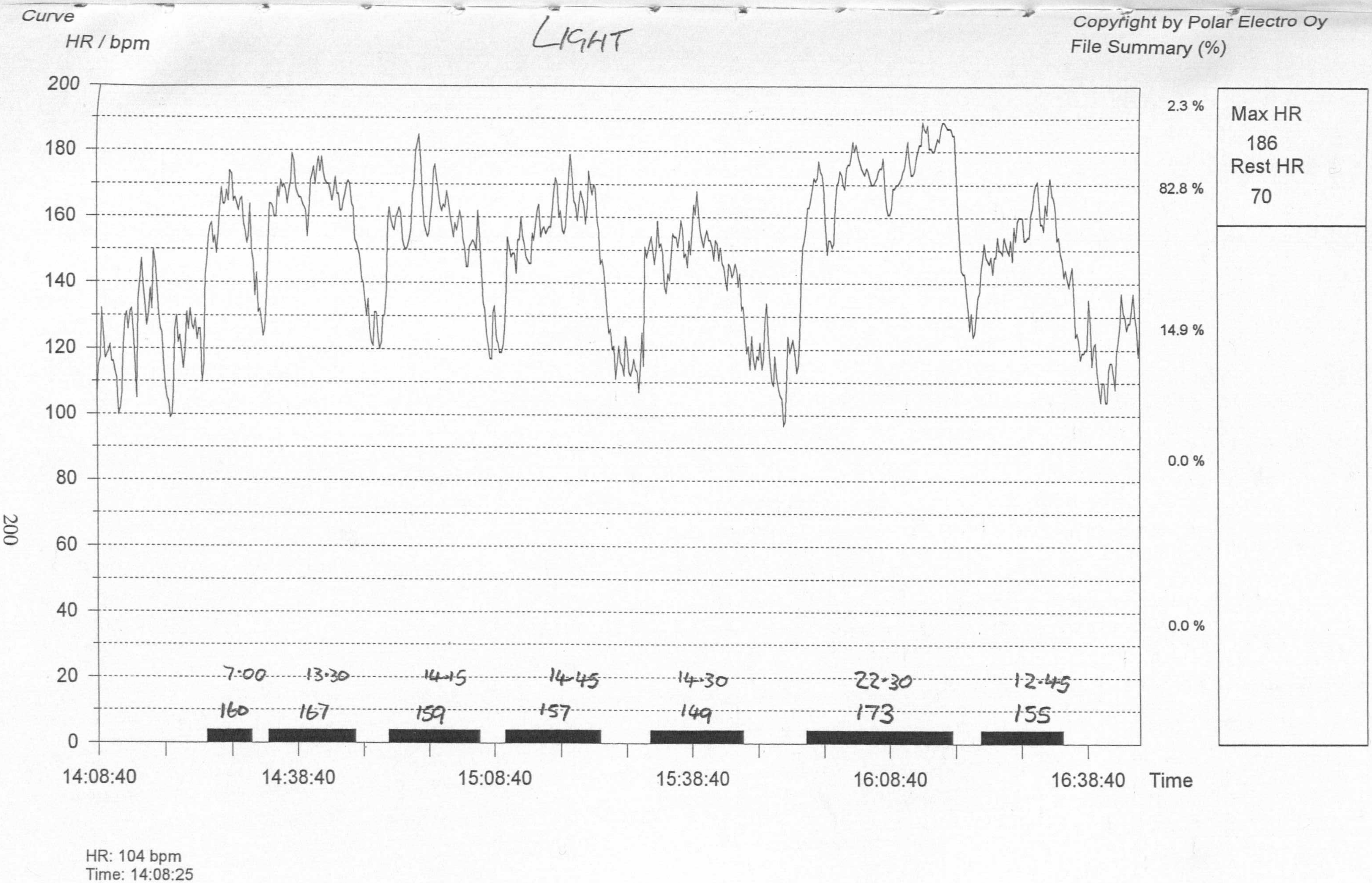
Person	SUBJECT 7	**Date**	20/08/1998	**Average**	141 bpm	**Recovery**	19 bpm
Exercise		**Time**	13:26:07.0	Duration of exercise: 6:20:32.3			
Note	Finn Worlds Athens 17-23 August 1998 light winds			Selected period: 14:28:22 - 16:31:37 (2:03:15.0)			



HR: 150 bpm
Time: 18:06:40

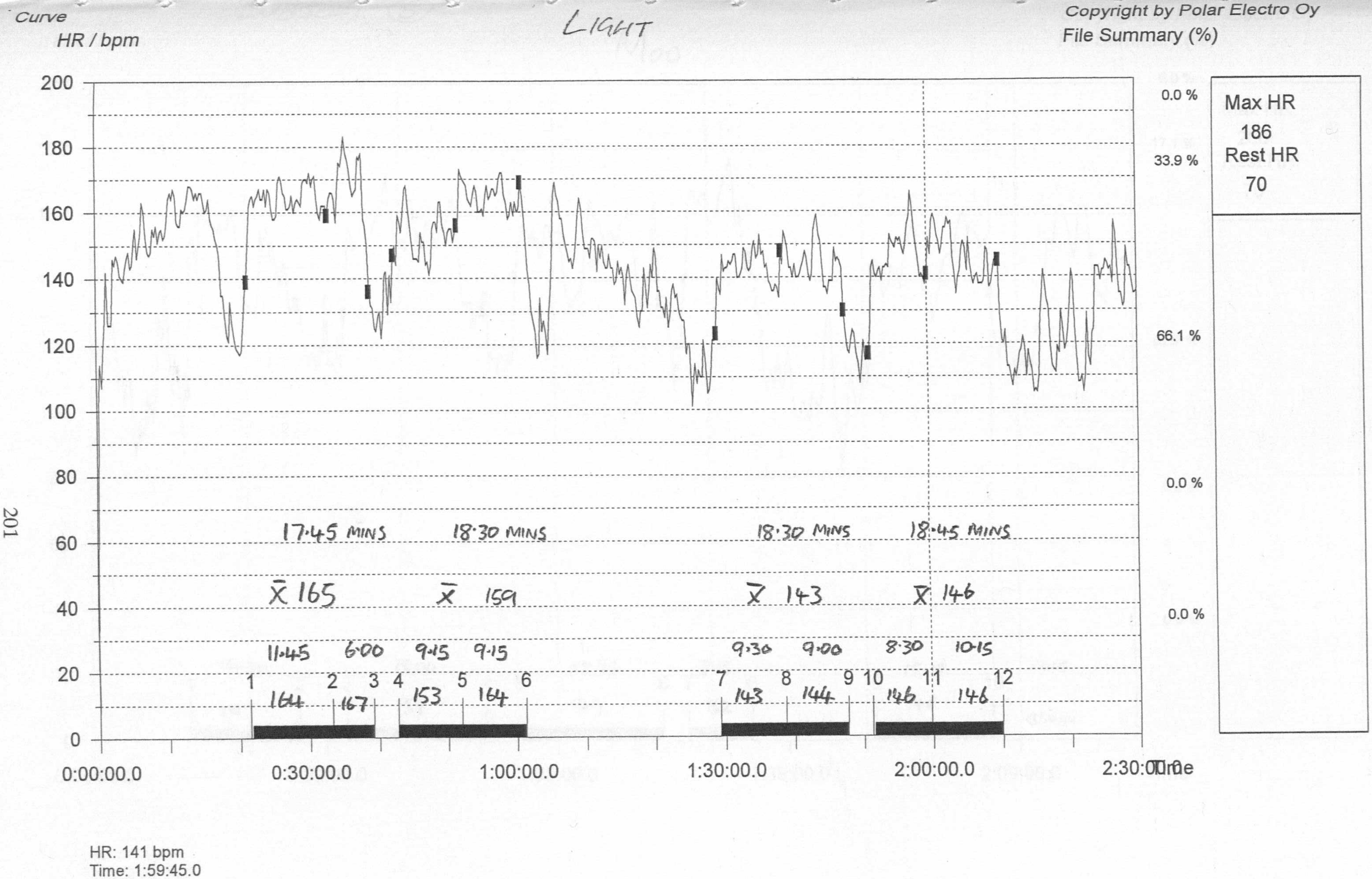
Person	SUBJECT ⑦	Date	22/08/1998	Average	144 bpm	Recovery	-33 bpm
Exercise		Time	13:54:55.0	Duration of exercise: 5:30:34.5			
Note	Finn Worlds Athens - 17-23 August 1998 light winds			Selected period: 16:37:10 - 18:36:10 (1:59:00.0)			

LIGHT



HR: 104 bpm
Time: 14:08:25

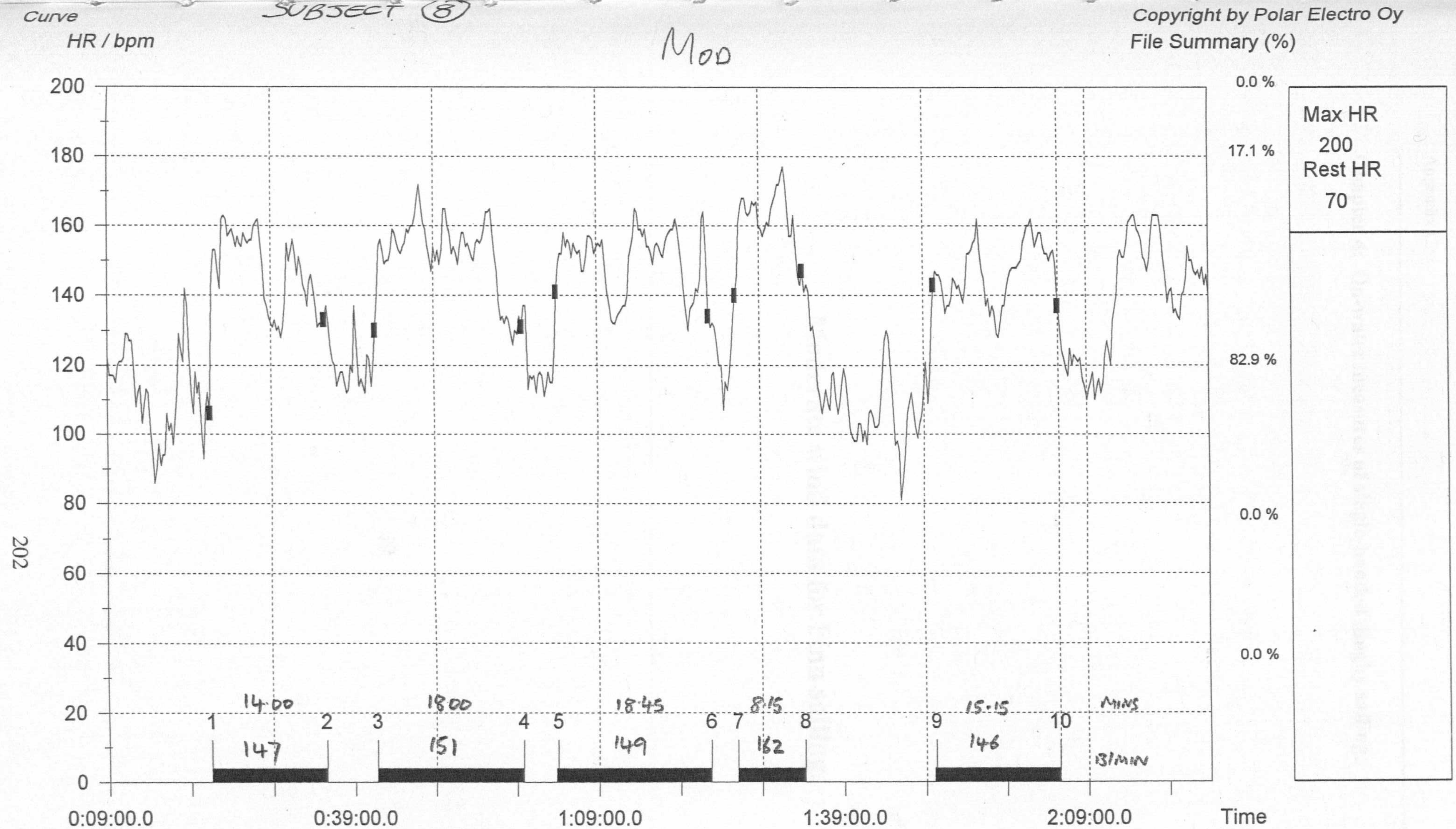
Person	SUBJECT 7	Date	03/04/2001	Average	161 bpm	Recovery	-22 bpm
Exercise		Time	13:53:40.0	Duration of exercise: 3:37:55.6			
Note	Palma 2, 8-10 knots, small races,			Selected period: 14:24:55 - 16:34:55 (1:37:30.0)			



Person	SUBJECT 7	Date	04/04/2001	Average	153 bpm	Recovery	15 bpm
Exercise		Time	13:56:40.0	Duration of exercise: 3:01:51.7			
Note	Palma day 3, 8-13 knots			Selected period: 0:21:45.0 - 2:10:00.0 (1:13:00.0)			

SUBJECT (8)

Mod



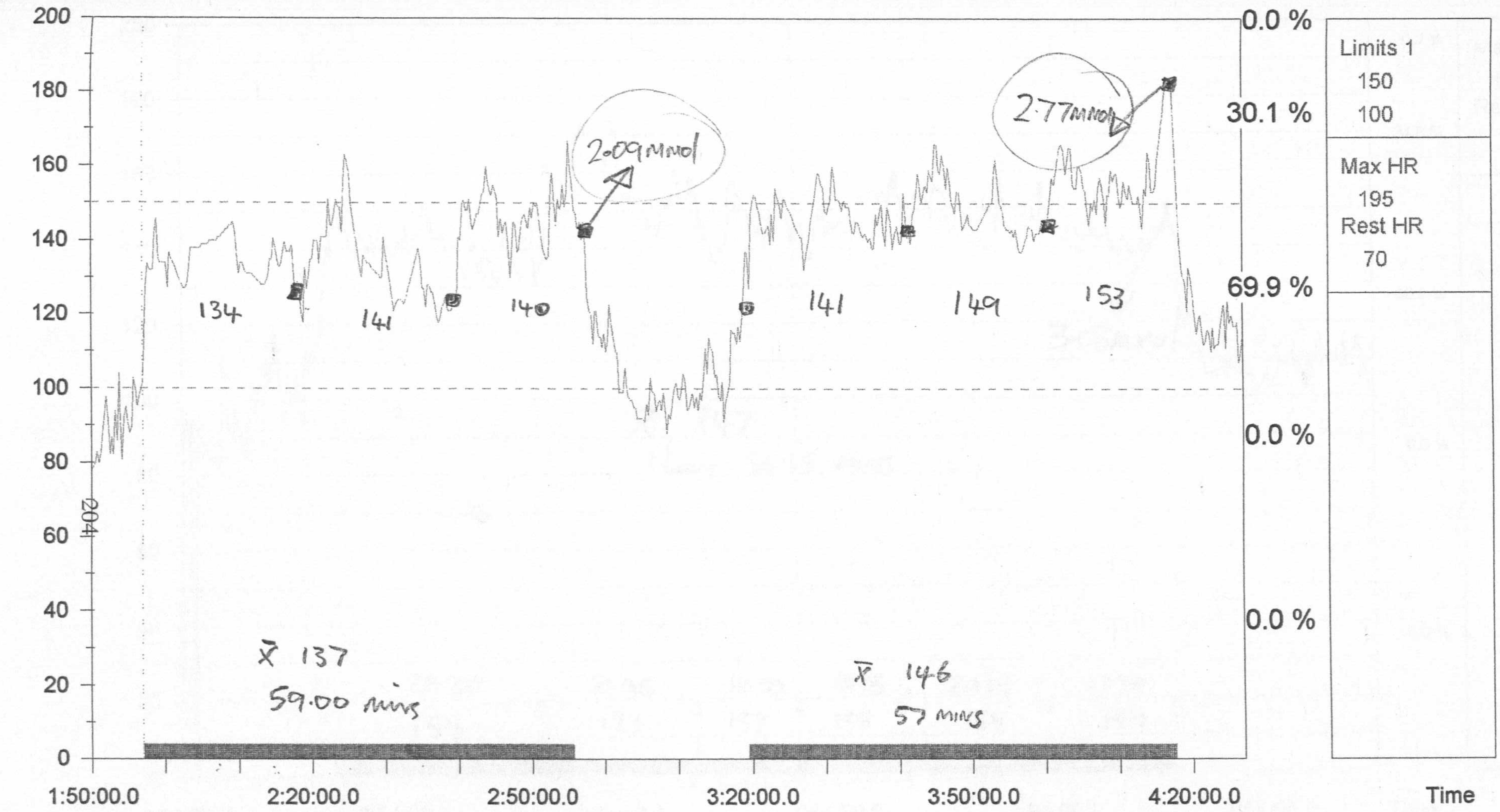
HR: 137 bpm
Time: 2:05:30.0

Person	SUBJECT (8)	Date	04/04/2001	Average	150 bpm	Recovery	-27 bpm
Exercise		Time	13:36:03.0	Duration of exercise: 3:17:34.3			
Note	Palma day 3, 8-13 knots			Selected period: 0:21:30.0 - 2:05:30.0 (1:14:45.0)			

Chapter 4: On-water measures of single-handed dinghy sailing.

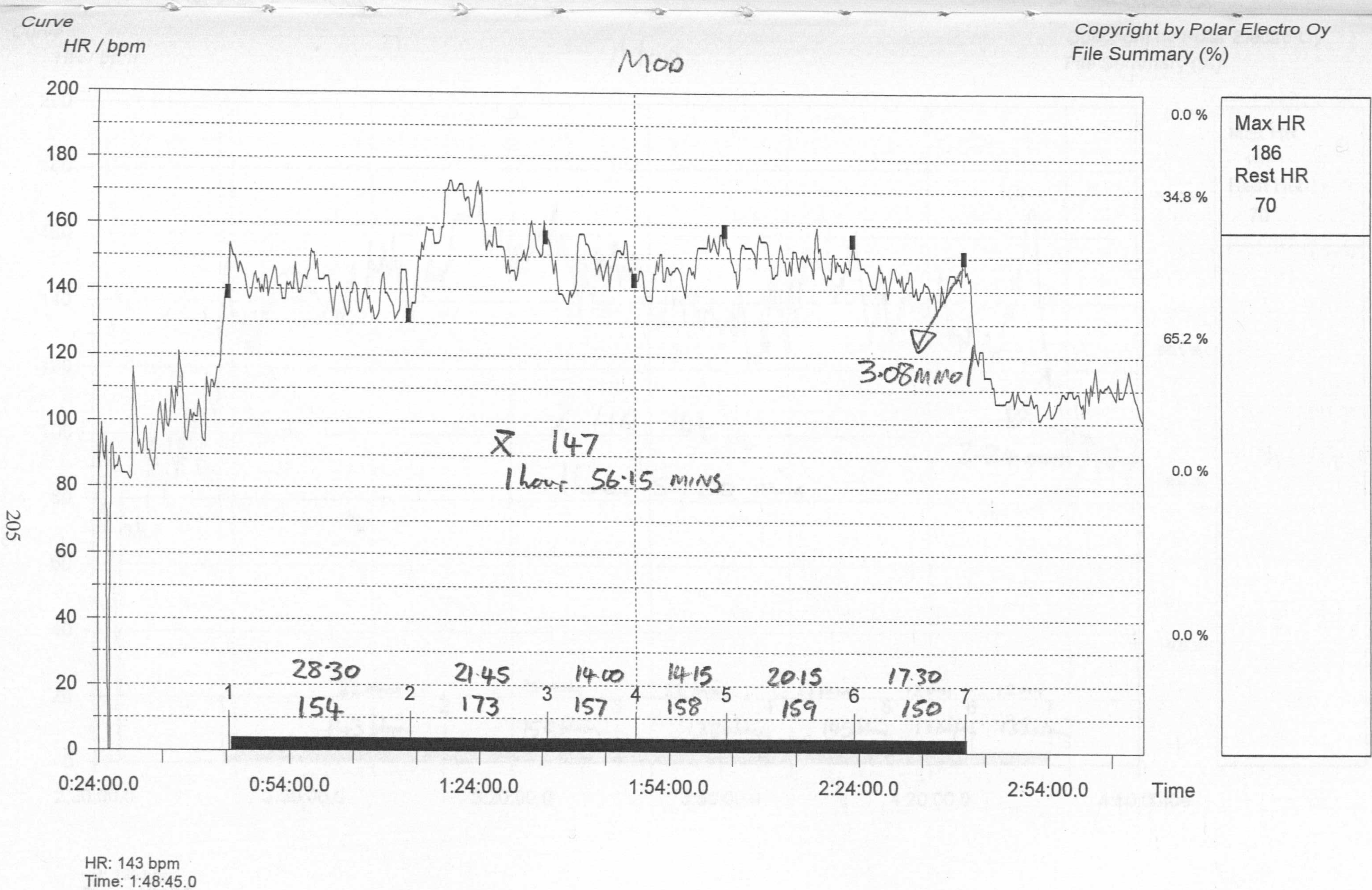
Moderate wind data for Finn sailing.

SUBJECT 1 MOD



HR: 102 bpm
Time: 1:57:00.0

Person	SUBJECT 1	Date	04/22/1998	Average	143 bpm	Recovery	-53 bpm
Exercise		Time	10:08:13.0 AM	Duration of exercise: 4:53:27.5			
Note	Hyeres. R7 (10-12 kn) 137 b/min. R8 (12-14 kn) 150 b/min			Selected period: 1:57:00.0 - 4:17:45.0 (1:57:00.0)			



Person	SUBJECT 1	**Date**	17/08/1998	**Average**	147 bpm	**Recovery**	9 bpm
Exercise		**Time**	22:25:21.0	Duration of exercise: 5:09:47.2			
Note	Finn World Championships - Athens - 17-23 August 1998			Selected period: 0:44:45.0 - 2:41:00.0 (1:56:15.0)			

Curve

HR / bpm

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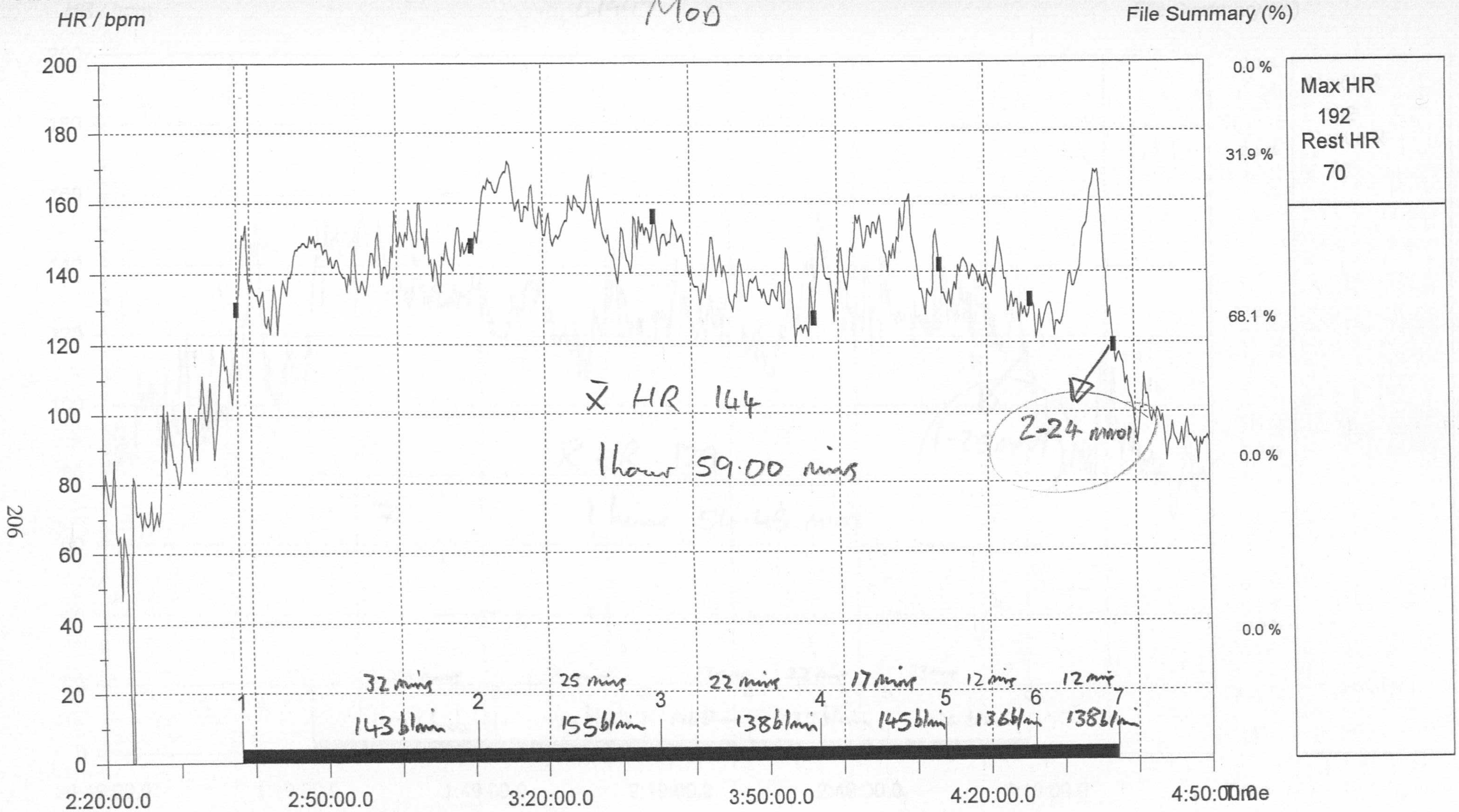
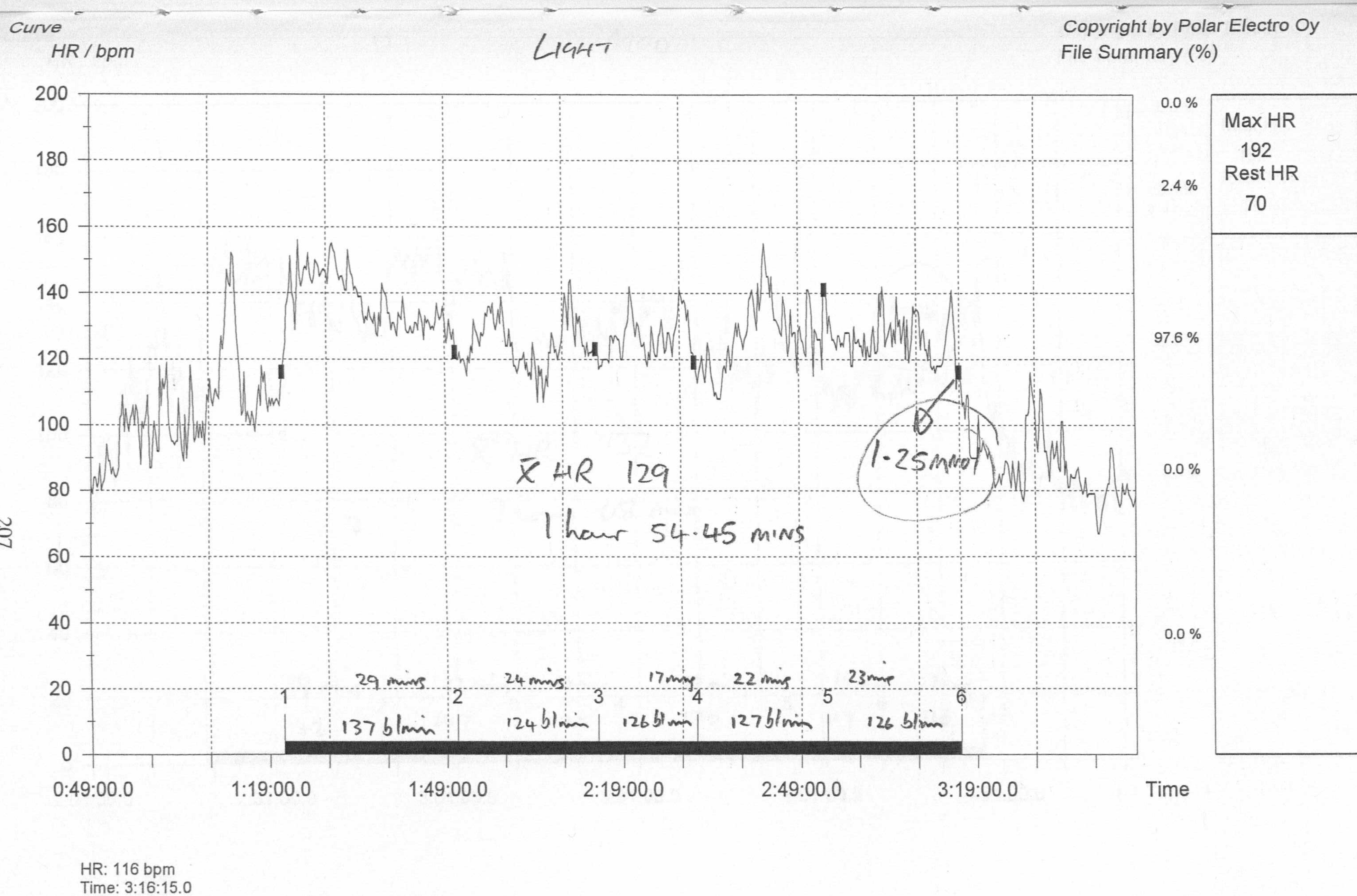
File Summary (%)



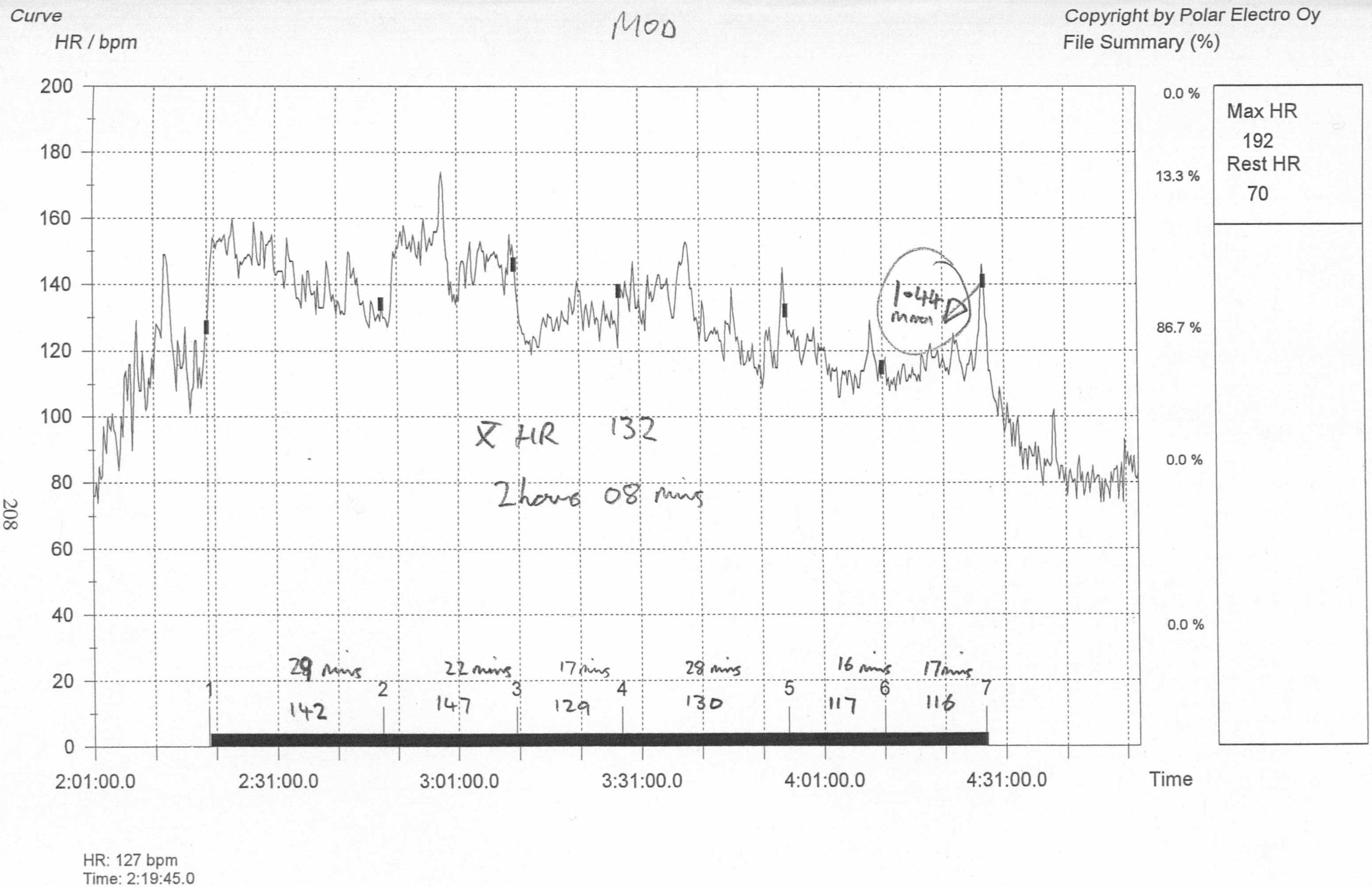
HR: 130 bpm

Time: 2:38:15.0

Person	SUBJECT 1	Date	18/08/1998	Average	144 bpm	Recovery	11 bpm
Exercise		Time	10:27:27.0	Duration of exercise: 6:56:11.7			
				Selected period: 2:38:15.0 - 4:37:15.0 (1:59:00.0)			



Person	SUBJECT 1	Date	19/08/1998	Average	129 bpm	Recovery	0 bpm
Exercise		Time	13:46:11.0	Duration of exercise: 10:39:08.0			
Note	Finn Worlds - Athens 17-23 August 1998 5-6 knots			Selected period: 1:21:30.0 - 3:16:15.0 (1:54:45.0)			

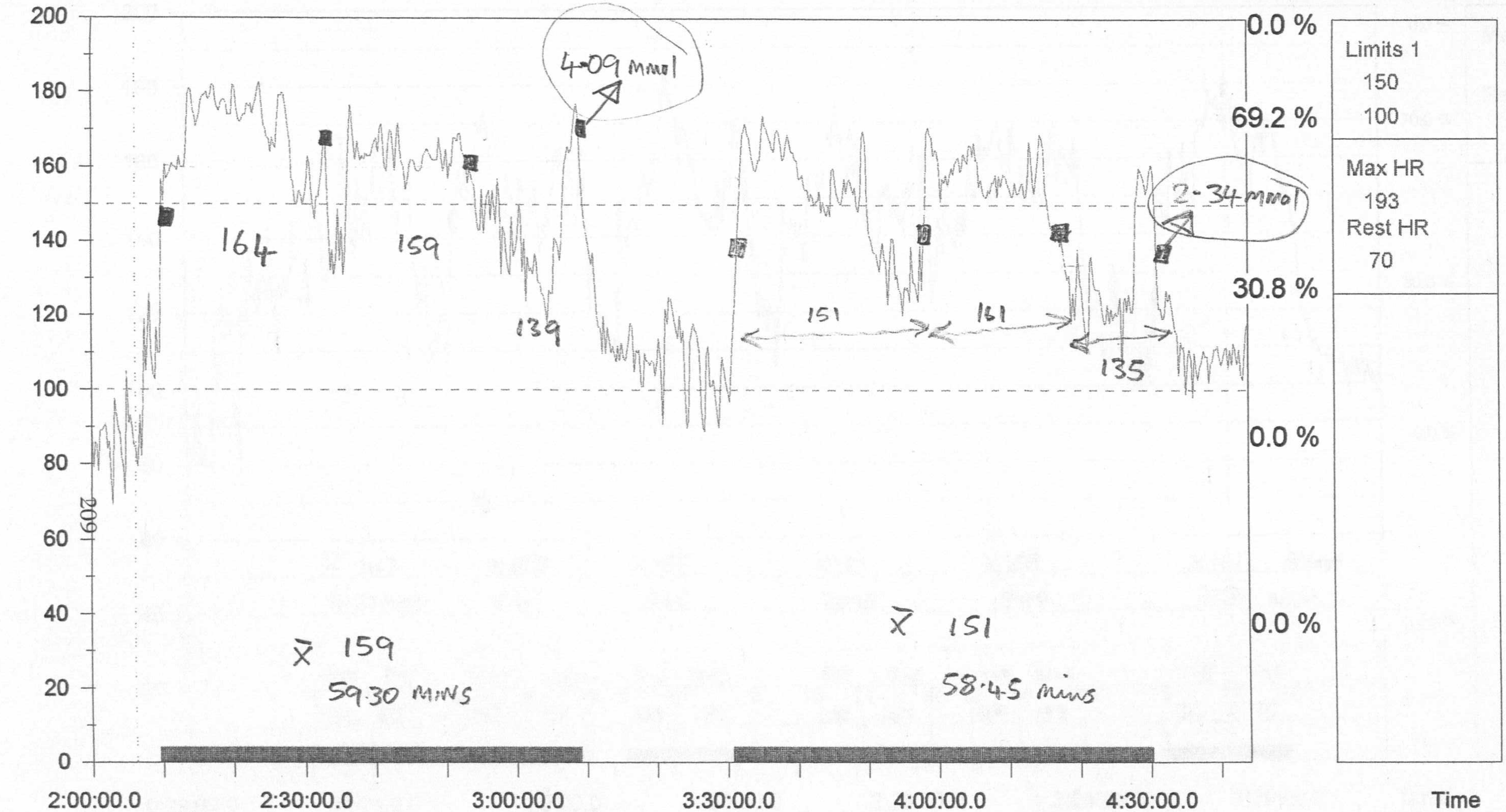


Person	SUBJECT 1	Date		Average	132 bpm	Recovery	6 bpm
Exercise		Time	10:27:37.0	Duration of exercise: 5:15:56.3			
				Selected period: 2:20:00.0 - 4:28:00.0 (2:08:00.0)			

SUBJECT (2)

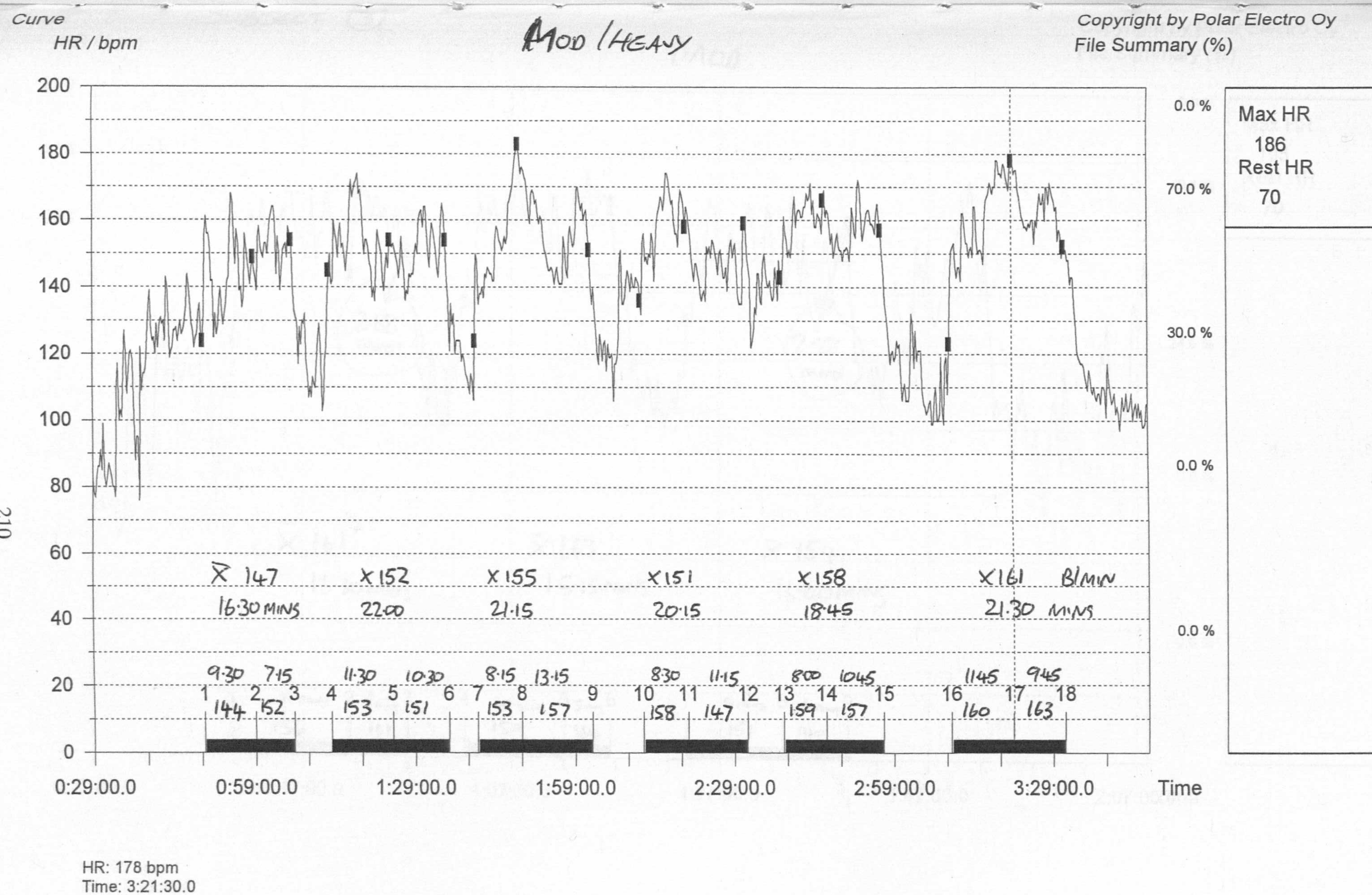
MOD

File Summary (%)

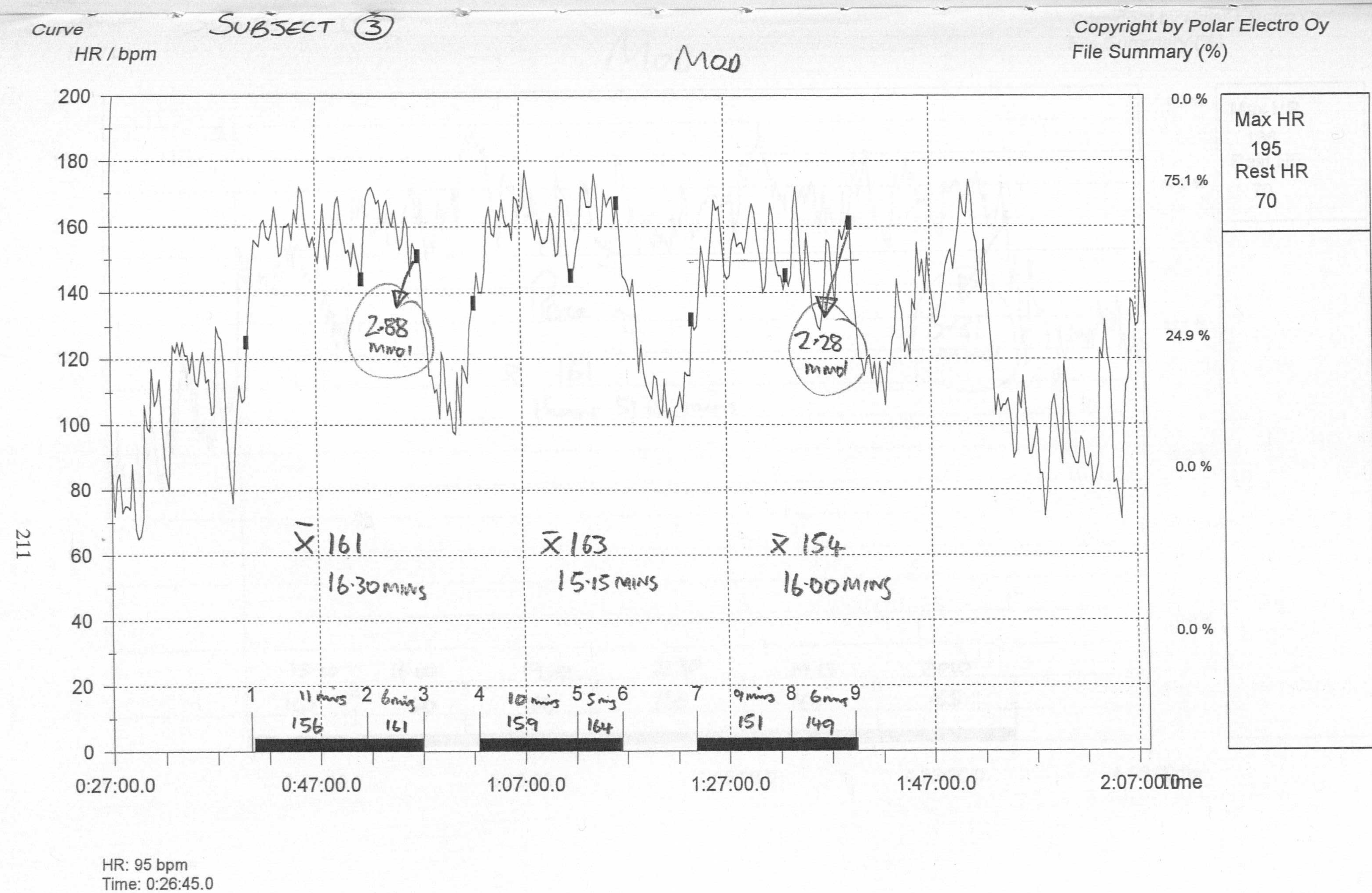


HR: 84 bpm
Time: 2:06:15.0

Person	SUBJECT (2)	Date	04/22/1998	Average	153 bpm	Recovery	-64 bpm
Exercise		Time	9:56:12.0 AM	Duration of exercise: 5:06:05.8			
Note	Hyeres. R7 159 b/min (10-12 kn). R8 146 b/min (12-14 kn).			Selected period: 2:09:30.0 - 4:30:15.0 (1:59:15.0)			



Person	SUBJECT 2	Date	01/08/2001	Average	155 bpm	Recovery	-23 bpm
Exercise		Time	12:13:40.0	Duration of exercise: 6:05:15.2			
Note	1/8/01. Havling Island 15-16 knots. windward leewards			Selected period: 0:49:45.0 - 3:31:15.0 (1:59:00.0)			



Person	SUBJECT ③	Date	22/01/2002	Average	156 bpm	Recovery	-14 bpm
Exercise		Time	01:10:48.0	Duration of exercise: 2:54:05.3			
Note	Palma Tues. 10-14 knots (up & down) Mean HR 156 b/min			Selected period: 0:40:30.0 - 1:39:30.0 (0:46:15.0)			

Curve SUBJECT (4)

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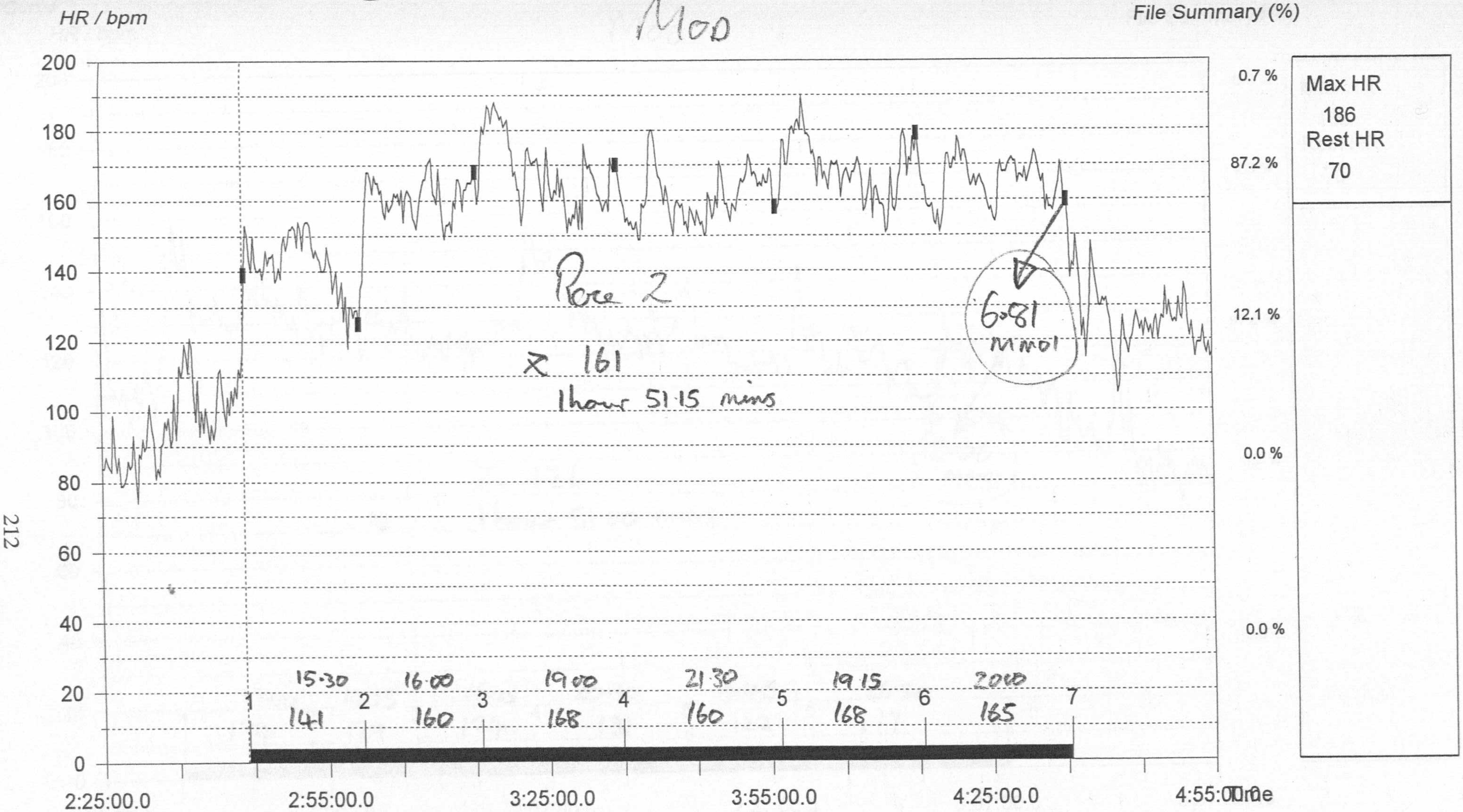
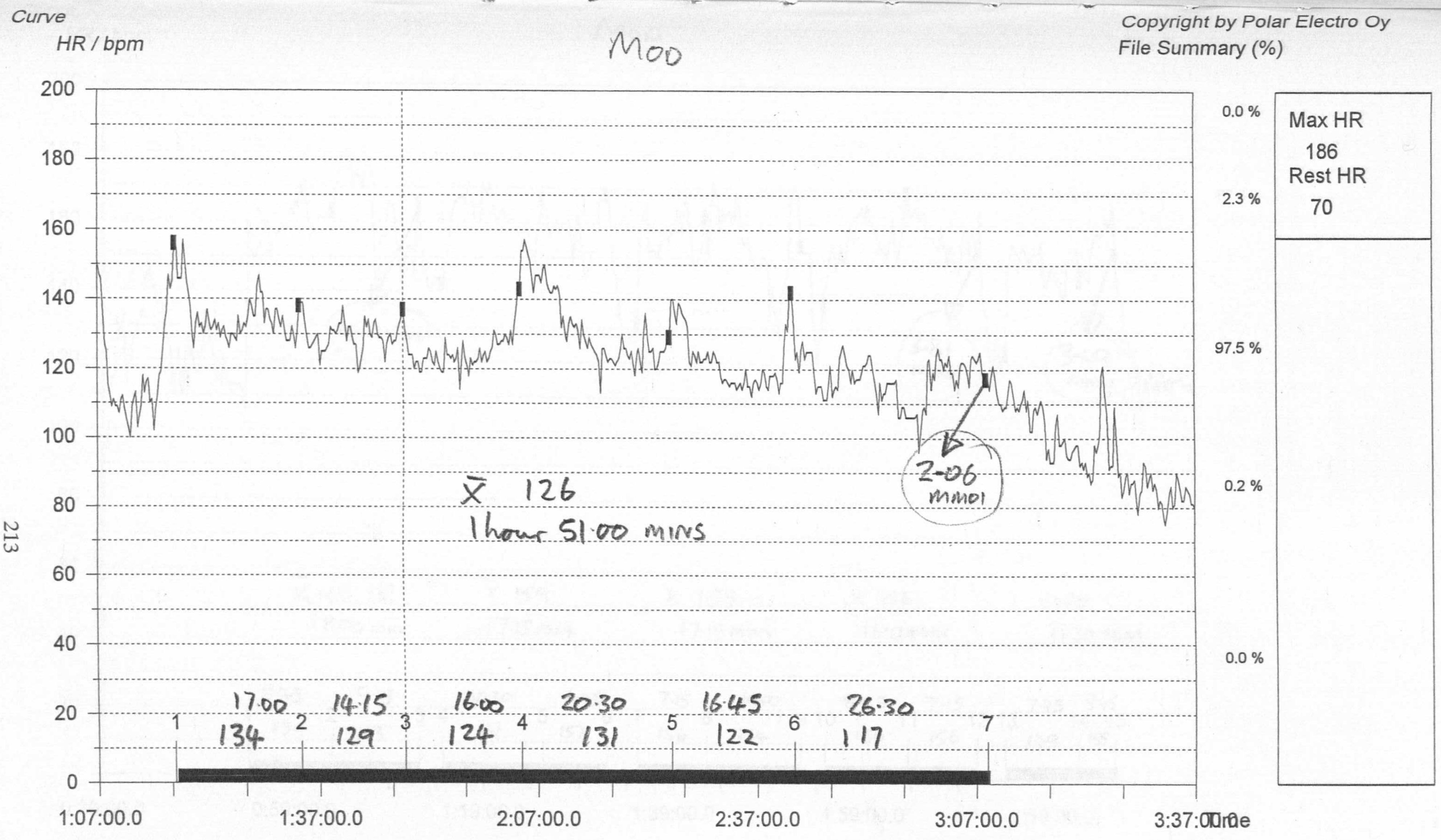
Mod



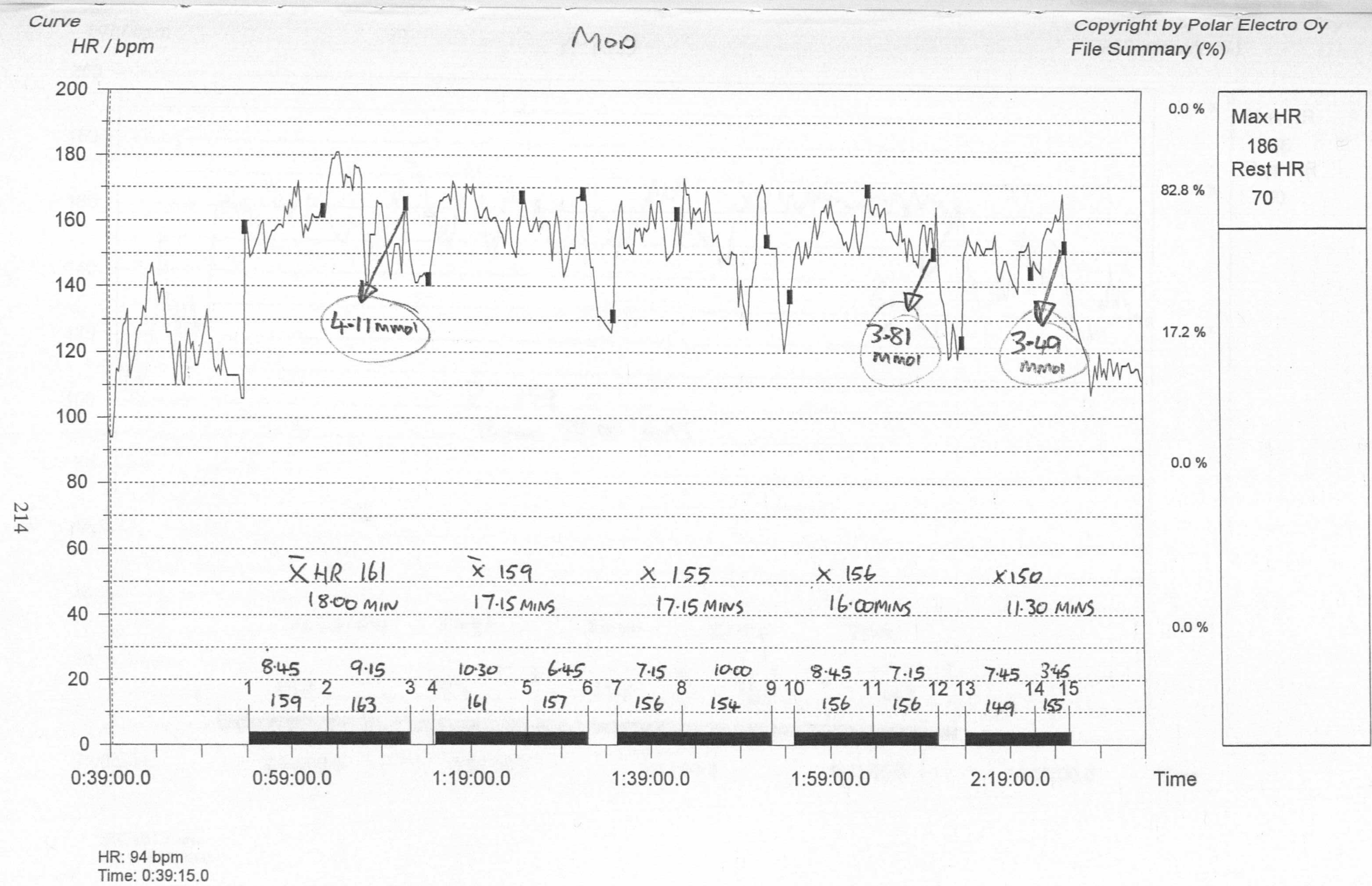
HR: 117 bpm
Time: 2:44:00.0

Person	SUBJECT (4)	Date	18/08/1998	Average	161 bpm	Recovery	-21 bpm
Exercise		Time	10:21:26.0	Duration of exercise: 5:36:16.8			
Note	Finn Worlds Athens 17-23 August 1998. 15 knots. won this race			Selected period: 2:44:15.0 - 4:35:30.0 (1:51:15.0)			



HR: 137 bpm
Time: 1:48:45.0

Person	SUBJECT 4	**Date**	1 /08/1998	**Average**	126 bpm	**Recovery**	40 bpm
Exercise		**Time**	23:55:43.0	Duration of exercise: 4:19:13.8			
				Selected period: 1:17:45.0 - 3:08:45.0 (1:51:00.0)			



Person	SUBJECT 4	Date	07/09/1999	Average	157 bpm	Recovery	-7 bpm
Exercise		Time	13:06:04.0	Duration of exercise: 3:30:33.4			
Note	Finn Sydney 7/9/99. 12-18 knots (windward/leewards)			Selected period: 0:54:15.0 - 2:25:45.0 (1:20:00.0)			

Curve SUBJECT

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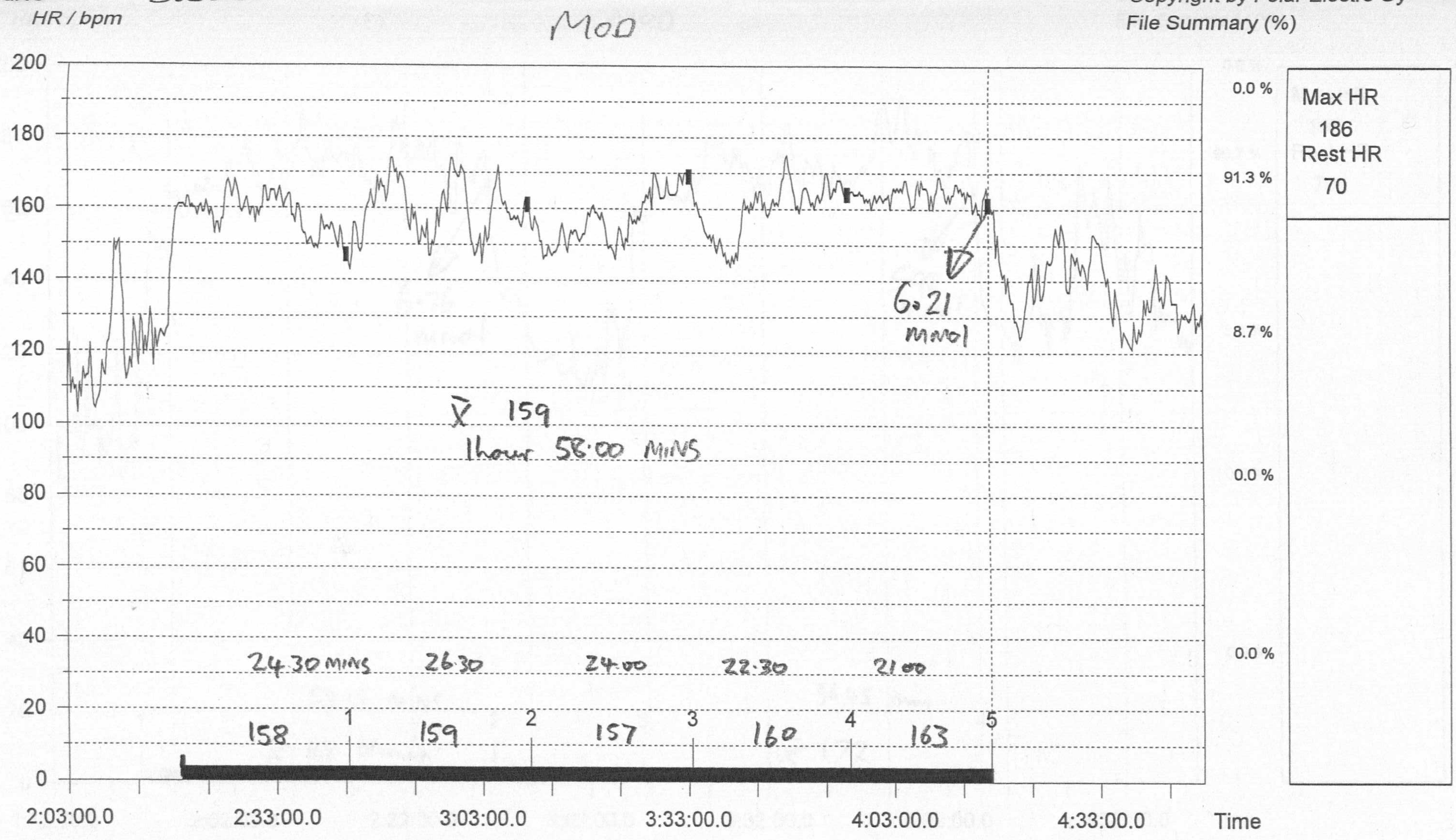
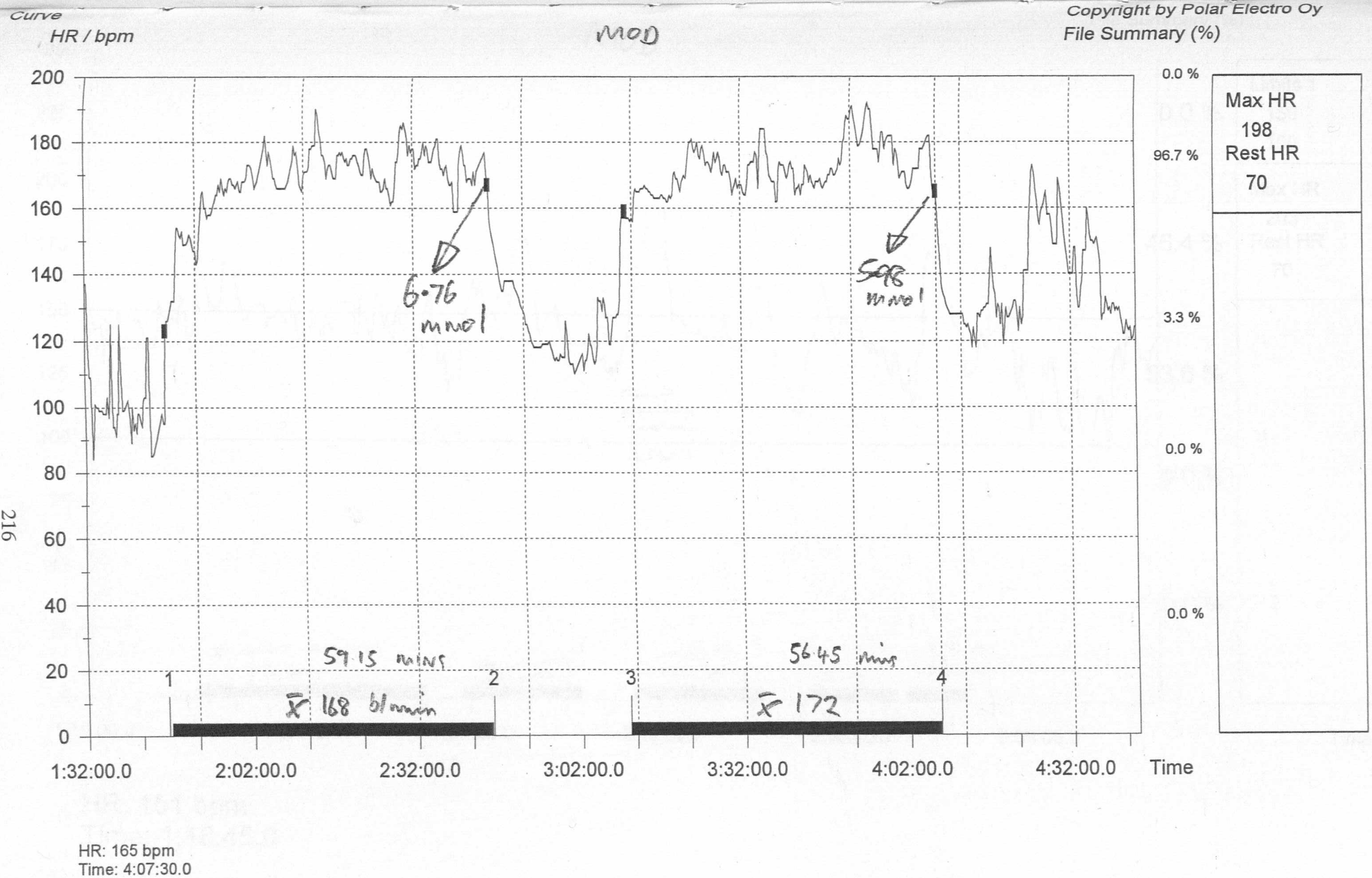
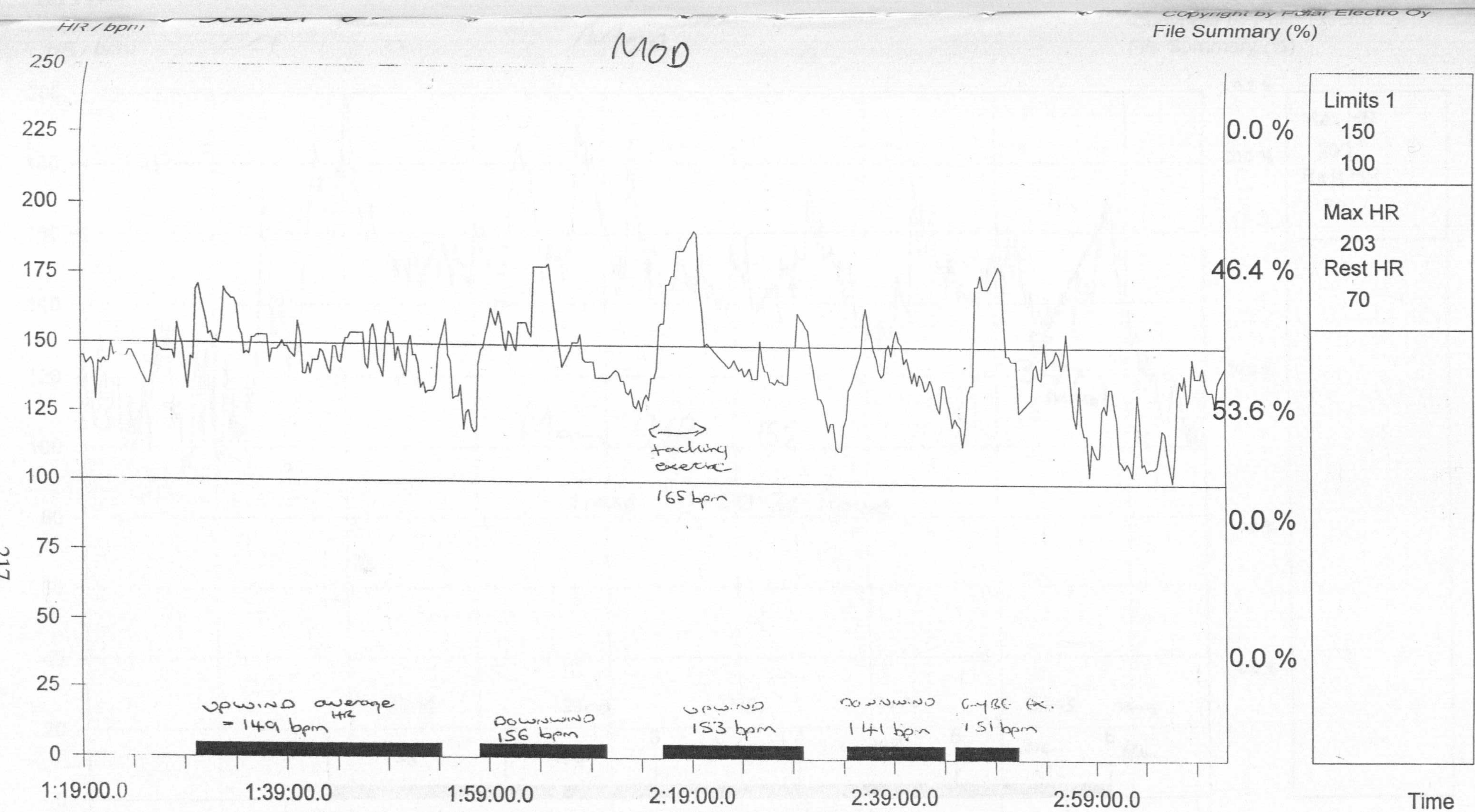


HR: 161 bpm
Time: 4:17:00.0

Person	SUBJECT 5	Date	16/08/1998	Average	159 bpm	Recovery	0 bpm
Exercise		Time	20:33:00.0	Duration of exercise: 9:55:05.7			
Note	Race 1, Finn Gold cup, Athens 16/08/98. 15 knots			Selected period: 2:19:15.0 - 4:17:15.0 (1:58:00.0)			

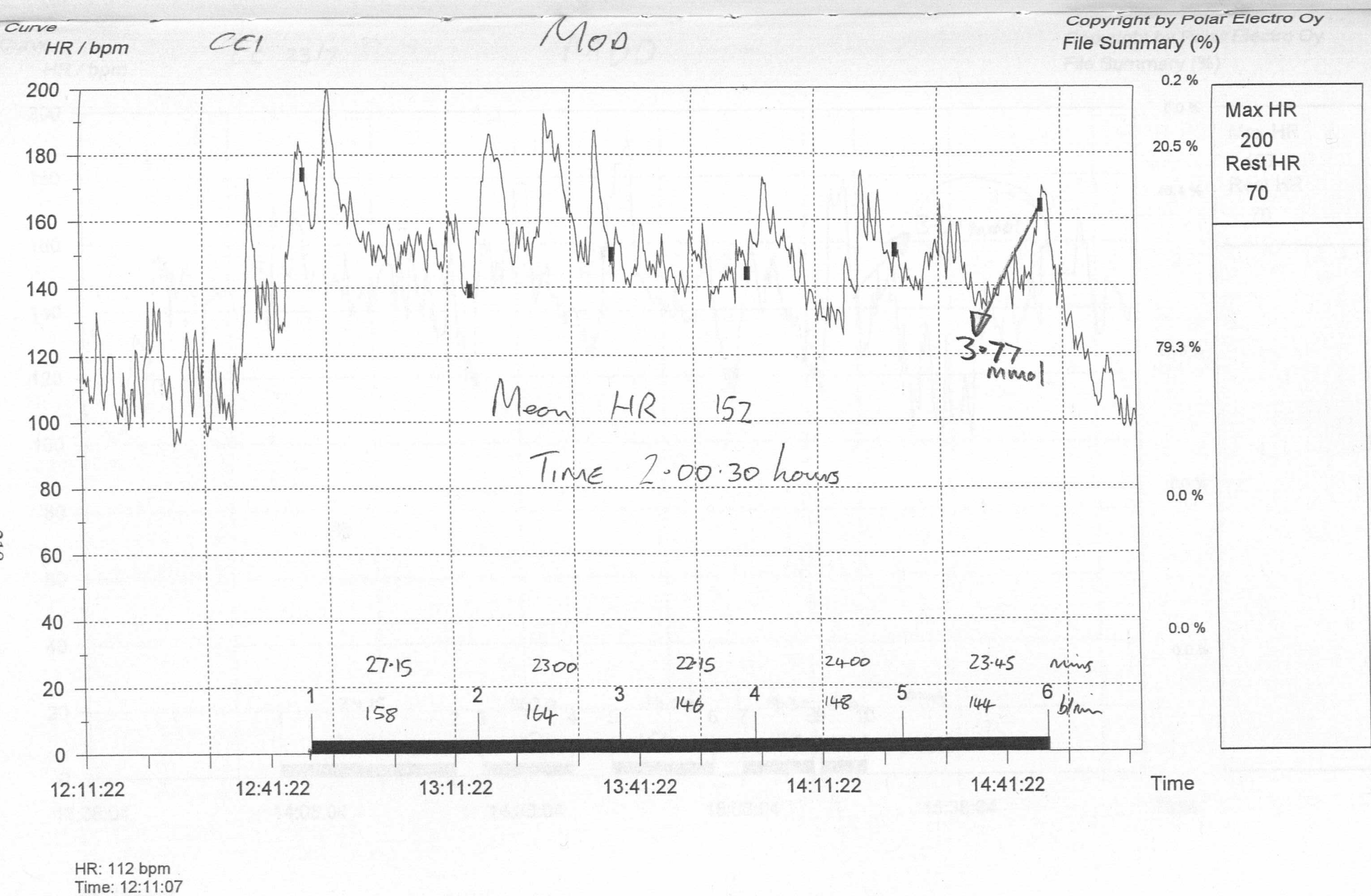


Person	SUBJECT 5	Date	22/04/1998	Average	170 bpm	Recovery	-44 bpm
Exercise		Time	10:17:24.0	Duration of exercise: 5:40:58.3			
Note	Hyeres. R7 (10-12 k) 168 b/min. R8 (12-14 kn) 172 b/min. Choppy			Selected period: 1:47:00.0 - 4:07:30.0 (1:55:15.0)			

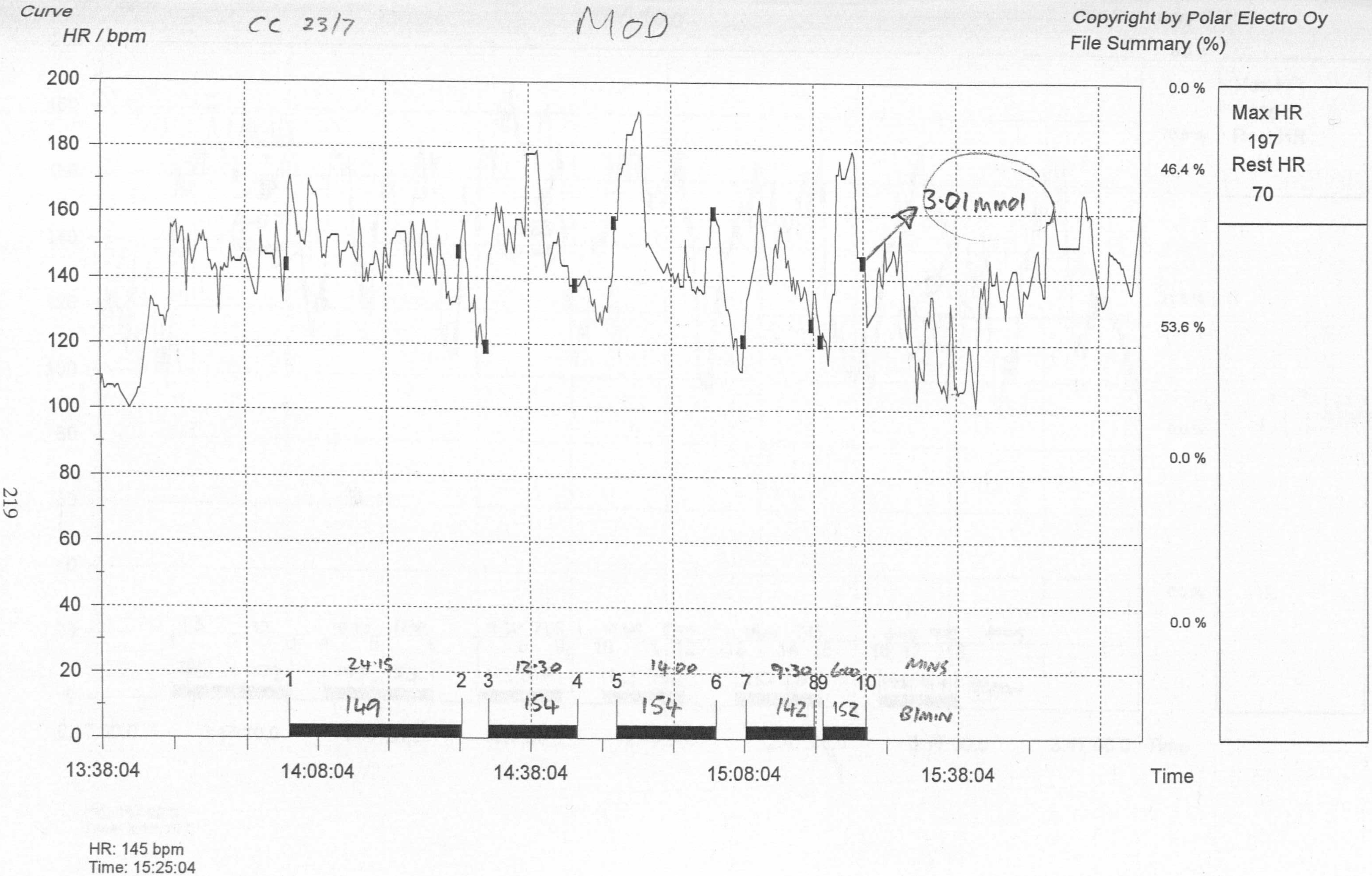


HR: 151 bpm
Time: 1:18:45.0

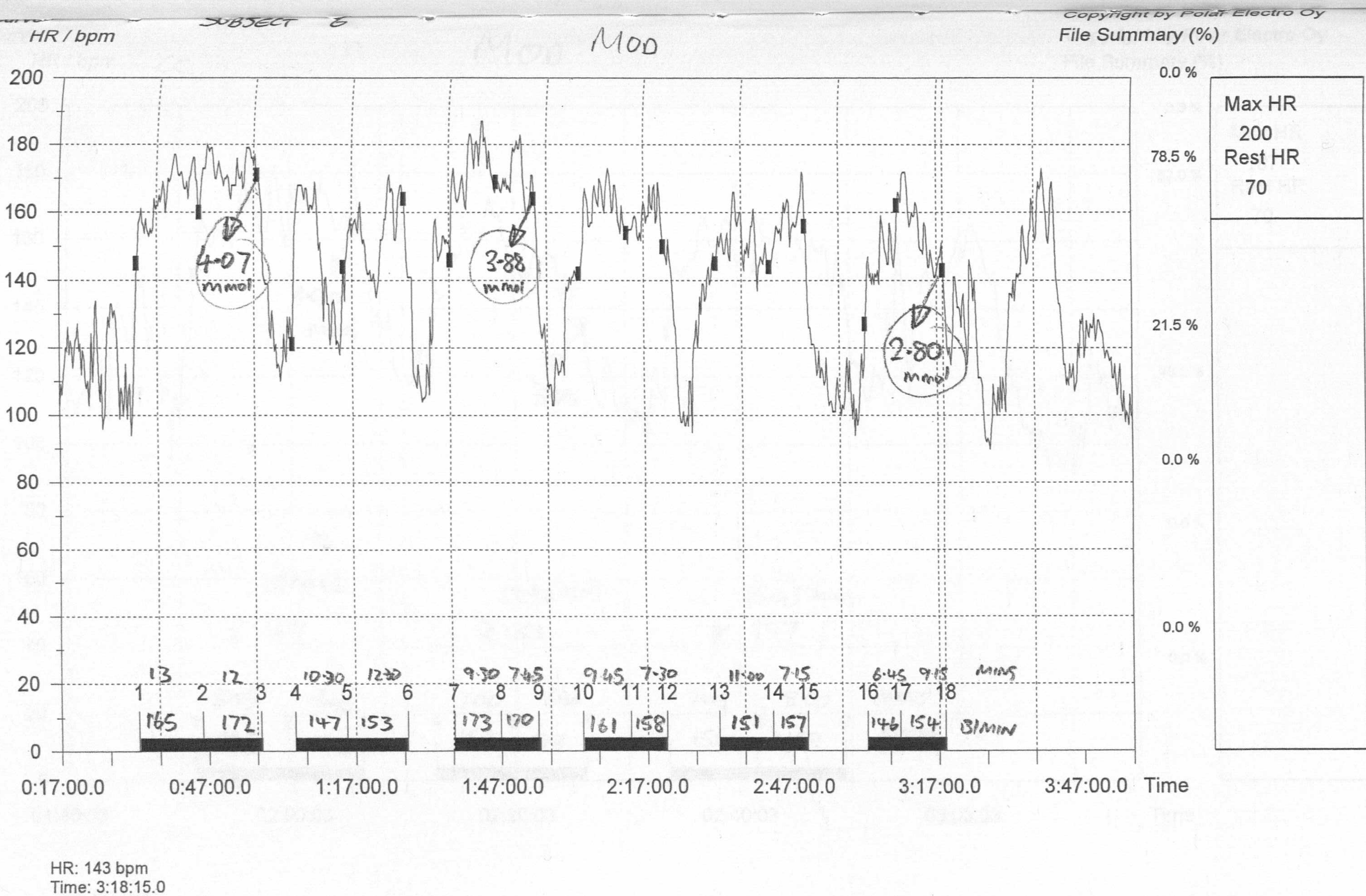
Person	SUBJECT 6	Date	07/23/1998	Average	150 bpm	Recovery	-4 bpm
Exercise		Time	12:34:04.0 PM	Duration of exercise: 4:17:38.8			
Note	23/7. Finns at Hayling (training) 15 knots			Selected period: 1:30:00.0 - 2:51:15.0 (1:06:45.0)			



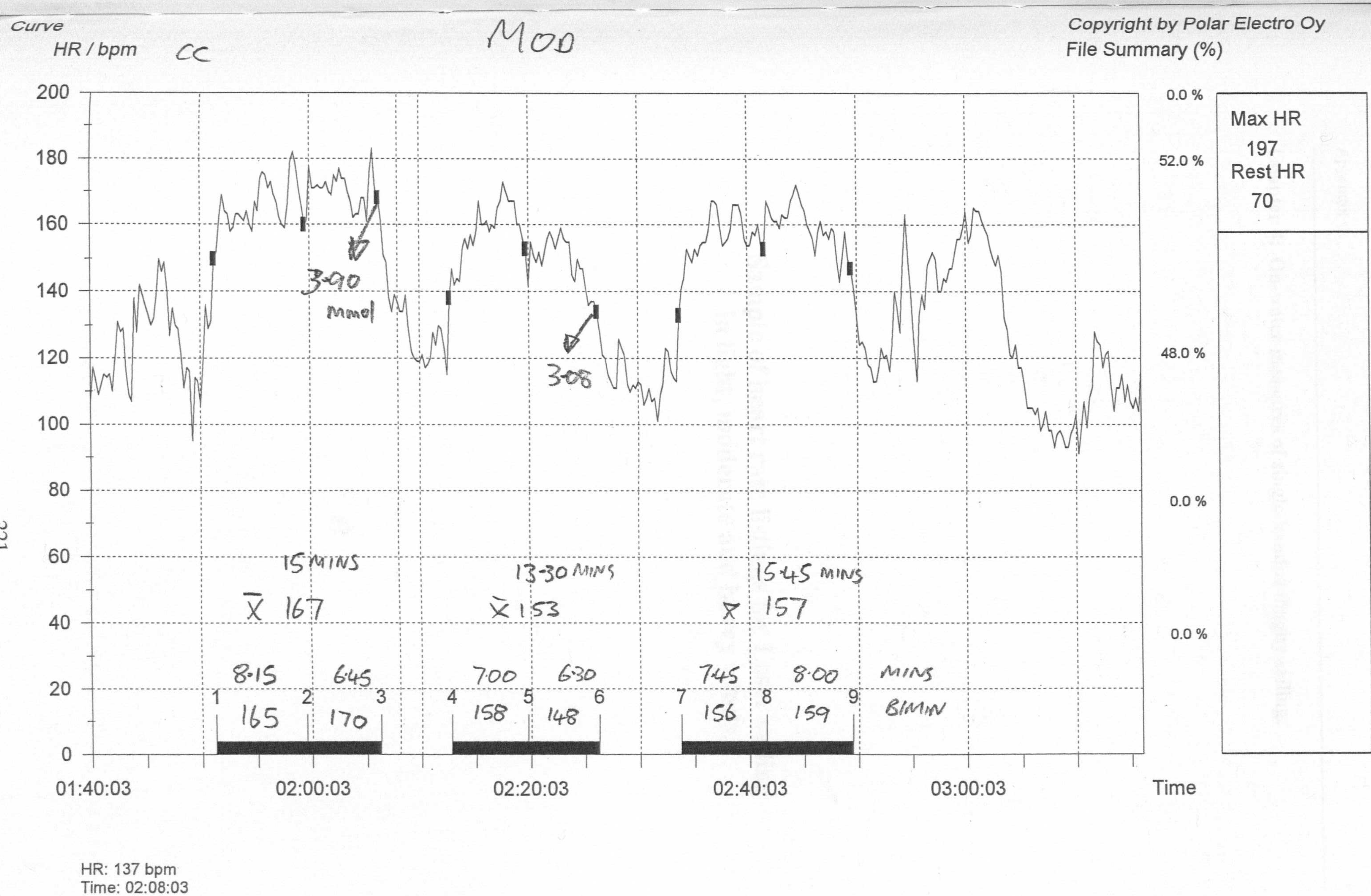
Person	SUBJECT 6	Date	17/08/1998	Average	152 bpm	Recovery	4 bpm
Exercise		Time	10:22:22.0	Duration of exercise: 5:19:08.5			
Note	Finn Worlds - Athens - 15 knots 17-23 August 1998			Selected period: 12:47:52 - 14:48:22 (2:00:30.0)			



Person	SUBJECT 6	**Date**	23/07/1998	**Average**	150 bpm	**Recovery**	-4 bpm
Exercise		**Time**	12:34:04.0	Duration of exercise: 4:17:38.8			



Person	SUBJECT 6	**Date**	01/08/2001	**Average**	159 bpm	**Recovery**	-21 bpm
Exercise		**Time**	13:20:27.0	Duration of exercise: 5:56:20.1			
Note	Hayling training 1/8/01, 15-16 knots, windward/leewards			Selected period: 0:33:00.0 - 3:18:30.0 (1:57:15.0)			



Person	SUBJECT 6	Date	22/01/2002	Average	159 bpm	Recovery	-18 bpm
Exercise		Time	01:10:03.0	Duration of exercise: 2:54:57.5			
Note	Palma Tues. 10-14 knots (windward/leewards) Mean HR 159 b/min			Selected period: 01:51:18 - 02:40:33 (0:44:15.0)			

Chapter 4: On-water measures of single-handed dinghy sailing.

Sample of heart rate listings for Laser sailing in light, moderate and heavy winds.

SUBJECT (12) LIGHT WINDS LASER

Listing (2/7)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
0:49:00	88	89	88	84	84	82	83	82	85	90	88	90
0:50:00	88	88	92	96	94	89	85	88	86	89	84	86
0:51:00	96	99	92	91	92	85	84	83	92	92	94	85
0:52:00	85	86	88	91	96	100	105	103	102	100	96	97
0:53:00	98	105	102	102	99	96	105	106	99	90	86	87
0:54:00	91	89	86	88	88	86	86	94	99	104	107	107
0:55:00	105	104	105	110	105	100	102	95	94	98	91	97
0:56:00	92	96	92	93	88	88	94	95	98	94	91	88
0:57:00	87	87	89	91	92	99	101	100	99	90	92	89
0:58:00	93	98	104	109	118	124	110	107	102	104	109	110
0:59:00	107	103	102	109	113	114	113	112	112	103	102	108
1:00:00	100	100	104	105	108	113	115	111	110	103	106	108
1:01:00	109	112	112	107	114	124	134	137	132	126	125	117
1:02:00	117	121	132	139	133	136	143	149	152	148	136	136
1:03:00	139	138	129	125	122	119	115	112	101	97	94	96
1:04:00	96	98	98	97	96	95	96	98	97	98	98	96
1:05:00	98	89	92	95	87	91	90	95	97	97	96	93
1:06:00	96	95	96	98	99	98	95	94	97	97	99	106
1:07:00	105	99	97	96	105	109	105	101	95	91	94	92
1:08:00	98	104	120	117	117	105	111	115	120	121	111	113
1:09:00	116	115	111	112	117	113	109	105	106	106	103	102
1:10:00	103	100	106	118	123	118	116	111	102	104	106	99
1:11:00	98	93	95	93	96	92	90	97	108	117	107	99
1:12:00	103	108	106	103	96	95	104	99	94	94	90	89
1:13:00	89	93	88	92	98	99	96	94	91	93	87	90
1:14:00	96	100	109	103	99	96	98	99	98	95	96	99
1:15:00	109	114	107	105	107	103	97	102	111	101	96	99
1:16:00	93	88	87	89	88	89	92	96	92	95	91	94
1:17:00	85	85	92	88	88	88	88	92	89	91	86	89
1:18:00	91	103	109	104	91	99	104	101	101	109	111	103
1:19:00	103	100	99	99	98	104	101	98	93	98	106	106
1:20:00	112	113	111	113	118	114	113	115	109	118	129	133
1:21:00	130	121	121	119	120	120	120	119	112	112	101	97
1:22:00	92	98	92	95	91	88	94	89	91	91	92	91
1:23:00	89	88	97	95	100	103	107	106	105	107	110	112
1:24:00	114	112	112	113	110	113	116	120	119	112	113	110
1:25:00	105	114	119	127	133	117	113	110	118	122	127	122
1:26:00	127	123	122	117	111	103	97	93	95	97	103	96
1:27:00	99	105	103	96	101	110	106	110	103	96	96	107
1:28:00	120	125	122	120	121	117	111	113	112	110	109	101
1:29:00	103	105	110	111	108	106	112	120	123	122	119	122
1:30:00	129	129	128	129	119	120	118	115	115	112	114	115
1:31:00	124	131	136	135	134	132	127	122	115	120	114	113
1:32:00	112	113	116	118	119	111	106	106	118	117	121	130
Race 3 1:33:00	132	131	137	147	[155	161	166	169	167	166	164	162
1:34:00	157	156	155	157	163	167	172	172	171	166	166	165
1:35:00	164	156	150	154	153	156	159	158	153	157	164	169
1:36:00	172	173	173	174	178	179	177	175	173	172	167	164
1:37:00	158	158	160	162	159	156	153	157	156	155	155	150

Listing (3/7)

SUBJECT 12 LIGHT WINDS LASER

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
1:38:00	147	147	146	147	152	156	161	167	170	172	173	174
1:39:00	176	174	172	169	169	169	166	165	167	166	161	161
1:40:00	162	163	162	164	163	163	166	168	165	160	157	154
1:41:00	155	154	149	147	152	158	164	168	170	171	169	169
1:42:00	169	168	165	158	156	152	150	152	151	155	157	156
1:43:00	158	154	156	159	161	164	168	168	163	163	164	164
1:44:00	164	161	160	166	173	178	178	177	178	177	175	174
1:45:00	177	180	183	182	180	179	179	177	174	172	167	165
1:46:00	163	154	156	157	158	158	158	158	158	152	154	158
1:47:00	160	157	157	157	159	155	153	143	143	145	144	144
1:48:00	146	154	162	165	161	159	159	161	164	164	163	159
1:49:00	158	159	163	169	170	172	174	174	171	170	169	169
1:50:00	168	167	165	161	160	159	160	160	160	159	159	160
1:51:00	159	157	157	158	158	159	158	161	164	162	160	155
1:52:00	155	155	152	150	150	149	150	149	150	148	152	152
1:53:00	152	152	151	149	149	149	149	147	149	147	147	149
1:54:00	152	147	146	138	141	143	147	146	145	146	144	147
1:55:00	147	143	142	148	142	142	145	150	152	146	147	155
1:56:00	148	148	153	155	156	156	156	156	149	151	156	155
1:57:00	151	144	142	141	142	142	142	142	141	138	137	138
1:58:00	138	140	140	140	134	132	137	139	135	134	132	129
1:59:00	130	129	129	127	124	124	123	123	125	122	123	126
2:00:00	123	124	124	126	126	128	129	128	126	127	126	129
2:01:00	129	129	126	129	125	125	125	128	125	126	124	121
2:02:00	118	121	121	123	122	122	122	120	119	119	119	121
2:03:00	120	124	121	120	119	120	120	120	119	117	118	118
2:04:00	115	119	117	117	119	121	117	114	117	120	116	120
2:05:00	111	111	116	111	115	112	117	114	116	116	119	116
2:06:00	116	113	118	118	121	123	126	117	118	117	118	120
2:07:00	116	118	115	115	115	116	115	114	115	116	119	118
2:08:00	117	116	116	114	114	112	113	117	118	117	116	113
2:09:00	116	118	120	118	130	144	146	144	144	145	140	136
2:10:00	138	137	147	154	154	153	154	156	155	152	153	149
2:11:00	146	148	143	147	157	158	158	158	158	161	163	163
2:12:00	163	164	165	165	166	165	163	164	161	159	161	160
2:13:00	159	159	161	164	167	169	167	164	164	163	161	158
2:14:00	158	159	160	159	157	158	159	159	158	159	162	164
2:15:00	162	163	164	162	158	159	158	157	156	151	149	151
2:16:00	151	150	150	143	143	139	139	150	157	162	166	168
2:17:00	167	167	168	169	167	162	158	158	156	159	164	168
2:18:00	171	172	171	169	167	166	165	163	161	163	167	172
2:19:00	175	177	177	178	178	178	177	177	174	172	171	162
2:20:00	161	163	160	159	160	159	159	163	166	167	167	168
2:21:00	169	169	168	168	170	173	174	175	174	172	172	173
2:22:00	174	173	172	173	173	172	171	170	167	168	168	167
2:23:00	164	161	163	162	162	163	162	161	166	168	168	167
2:24:00	166	165	165	164	162	161	160	162	163	163	163	161
2:25:00	161	162	162	162	162	163	163	163	161	157	155	151
2:26:00	151	150	150	149	153	152	150	145	143	139	141	142

SUBJECT (12) LIGHT WINDS CASEK

Listing (4/7)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
2:27:00	139	139	131	132	133	134	135	136	129	130	127	128
2:28:00	125	128	131	132	133	130	130	132	130	132	133	131
2:29:00	133	131	128	132	138	136	135	135	134	134	136	137
2:30:00	139	134	135	137	138	142	136	135	136	131	132	135
2:31:00	142	147	147	146	135	138	143	142	147	148	142	139
2:32:00	141	135	138	142	148	144	144	142	145	154	156	156
2:33:00	157	158	154	156	157	156	158	160	158	156	160	159
2:34:00	159	159	161	165	168	170	169	171	175	177	177	178
2:35:00	179	180	179	178	177	177	177	176	175	175	171	165
2:36:00	161	152	147	142	141	138	138	126	121	118	111	119
2:37:00	118	117	113	106	109	111	105	110	117	111	109	113
2:38:00	115	114	115	111	116	120	115	117	111	114	103	99
2:39:00	103	105	102	109	113	105	107	107	103	99	104	105
2:40:00	100	93	101	102	108	109	108	109	108	109	108	109
2:41:00	110	109	115	120	114	114	104	108	108	110	107	105
2:42:00	108	113	112	113	108	105	104	100	104	104	109	110
2:43:00	113	109	99	99	100	100	103	101	101	98	100	99
2:44:00	103	97	96	94	97	103	104	101	98	100	97	99
2:45:00	102	102	97	101	98	98	96	99	102	104	103	95
2:46:00	100	94	96	92	101	99	100	96	99	96	97	96
2:47:00	105	115	111	100	104	104	106	101	99	97	100	106
2:48:00	102	110	124	130	133	136	140	137	136	142	147	142
2:49:00	136	138	139	136	136	136	135	134	129	127	126	123
2:50:00	119	120	125	116	117	112	114	102	98	104	119	112
2:51:00	105	111	108	107	109	105	116	122	121	118	120	114
2:52:00	117	120	114	110	108	112	114	113	113	105	105	98
2:53:00	96	94	98	93	91	99	105	109	117	124	127	124
2:54:00	120	120	119	120	125	124	128	133	132	116	129	127
2:55:00	130	131	125	125	122	121	124	121	124	125	126	109
2:56:00	119	122	115	110	108	114	106	101	102	103	108	102
2:57:00	104	99	98	102	95	94	97	94	88	91	92	93
2:58:00	94	97	95	99	102	101	103	109	110	105	100	96
2:59:00	94	93	99	97	98	93	89	84	84	85	85	86
3:00:00	93	94	93	92	96	95	100	100	100	108	111	118
3:01:00	119	117	120	118	119	116	114	112	114	115	112	107
3:02:00	105	100	106	103	101	103	103	102	103	99	93	92
3:03:00	99	103	101	106	105	102	104	102	100	102	106	112
3:04:00	107	102	104	100	100	101	103	100	96	90	95	98
3:05:00	108	111	103	97	105	107	114	115	114	109	115	121
3:06:00	122	120	122	123	121	121	120	121	127	127	130	131
3:07:00	134	131	127	127	124	116	120	113	104	100	97	105
3:08:00	105	105	110	110	108	98	105	104	107	110	116	118
3:09:00	120	120	119	119	124	125	123	123	120	120	120	121
3:10:00	122	120	121	120	119	113	100	97	97	105	106	101
3:11:00	102	101	105	106	99	102	117	126	129	134	141	152
3:12:00	159	164	166	166	168	171	176	178	175	167	162	152
3:13:00	148	139	133	131	133	129	125	122	119	115	118	123
3:14:00	127	113	112	109	111	104	102	98	98	99	99	97
3:15:00	102	101	108	97	99	100	100	105	106	103	103	100

Roe 3

SUBJECT 12 LIGHT WINDS LASER

Listing (3/8)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
1:38:00	102	97	99	100	95	97	97	100	95	94	98	100
1:39:00	100	100	109	107	108	115	112	109	112	123	133	140
1:40:00	142	147	147	143	142	137	131	125	120	109	113	108
1:41:00	103	115	119	114	112	110	115	111	106	98	97	92
1:42:00	90	90	93	92	97	92	94	89	93	87	90	95
1:43:00	95	84	84	81	83	83	84	86	92	92	96	103
1:44:00	105	103	103	103	76	81	79	83	90	88	91	91
1:45:00	87	90	90	91	87	91	90	84	88	98	90	94
1:46:00	90	90	95	90	88	86	81	89	89	91	84	88
1:47:00	85	87	86	90	88	93	91	94	107	122	127	112
1:48:00	107	114	108	110	113	117	121	130	140	146	145	146
1:49:00	153	158	162	165	165	164	163	161	158	154	151	150
1:50:00	145	144	146	146	147	144	139	141	143	141	135	137
1:51:00	140	140	142	140	138	136	136	137	131	135	133	134
1:52:00	136	131	133	136	136	134	138	137	134	134	136	139
1:53:00	138	132	134	136	136	136	144	153	151	152	155	155
1:54:00	155	153	144	140	142	132	133	132	131	134	132	131
1:55:00	126	123	127	127	131	134	129	122	122	129	141	150
1:56:00	144	139	141	142	142	145	141	138	135	137	138	136
1:57:00	139	144	141	136	137	133	129	131	133	132	131	131
1:58:00	132	133	132	132	135	127	126	131	132	132	131	132
1:59:00	133	130	127	133	125	126	131	134	131	134	129	128
2:00:00	130	127	129	130	129	129	126	130	134	128	126	129
2:01:00	124	126	129	126	126	129	137	148	144	139	139	142
2:02:00	144	139	138	134	130	132	133	135	134	132	135	133
2:03:00	132	136	135	136	135	129	130	127	126	122	124	125
2:04:00	128	128	127	121	122	124	115	117	120	124	122	127
2:05:00	132	133	129	128	129	131	130	132	135	135	129	134
2:06:00	145	150	147	146	146	146	143	136	136	132	132	133
2:07:00	131	127	130	132	133	127	127	131	130	129	130	134
2:08:00	128	129	126	129	122	123	116	118	122	123	121	124
2:09:00	124	125	122	124	128	124	119	113	116	121	122	124
2:10:00	125	127	125	120	119	118	121	114	118	120	116	108
2:11:00	113	116	122	130	133	121	119	122	122	121	125	123
2:12:00	124	115	118	120	128	126	122	123	122	124	119	122
2:13:00	121	123	122	124	119	122	125	123	123	126	126	125
2:14:00	124	121	120	118	119	123	122	123	123	125	125	127
2:15:00	128	129	131	126	126	128	125	124	127	126	125	128
2:16:00	127	128	130	132	134	134	134	134	134	131	128	124
2:17:00	120	122	125	116	120	122	124	123	126	128	127	127
2:18:00	127	123	119	120	124	126	129	125	128	130	131	132
2:19:00	133	136	137	136	137	134	133	134	136	132	130	132
2:20:00	134	134	137	139	139	139	141	139	137	137	140	138
2:21:00	139	139	142	142	147	144	142	145	149	145	140	144
2:22:00	138	139	139	139	137	137	140	148	157	160	159	156
2:23:00	158	157	158	152	157	159	161	153	152	157	156	158
2:24:00	159	156	157	158	156	153	151	153	155	157	153	154
2:25:00	149	152	154	153	153	152	151	154	152	150	151	152
2:26:00	156	157	159	159	158	156	154	152	152	148	152	154

Race 5

SUBJECT 12 LIGHT WINDS LASER

Listing (4/8)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
2:27:00	154	156	151	154	155	156	153	151	152	150	147	148
2:28:00	149	149	151	146	148	153	150	148	145	145	142	145
2:29:00	145	154	162	166	167	168	168	165	162	158	155	157
2:30:00	159	162	163	164	165	163	163	164	162	161	162	161
2:31:00	153	150	152	154	159	165	161	160	162	154	153	155
2:32:00	159	157	152	148	149	149	149	149	149	149	146	149
2:33:00	142	144	147	145	147	149	154	152	154	157	159	155
2:34:00	154	157	162	165	168	170	173	177	181	183	179	180
2:35:00	183	186	183	181	181	182	182	183	184	183	182	177
2:36:00	173	170	168	166	158	156	157	156	151	154	153	153
2:37:00	154	155	151	152	153	152	149	149	145	146	144	141
2:38:00	144	145	143	143	141	139	137	141	141	141	143	144
2:39:00	147	148	145	144	143	143	137	138	141	141	140	139
2:40:00	140	139	141	142	143	145	139	139	134	140	150	150
2:41:00	150	151	150	145	146	145	145	143	141	142	141	141
2:42:00	138	135	134	137	138	139	135	133	133	135	133	133
2:43:00	134	130	134	132	132	133	133	132	129	133	136	143
2:44:00	154	157	159	159	159	158	156	155	150	148	148	143
2:45:00	138	141	137	136	136	137	129	130	124	127	131	127]
2:46:00	124	123	120	111	112	109	112	111	114	114	115	112
2:47:00	102	108	102	108	103	102	108	109	108	110	109	108
2:48:00	111	110	113	112	110	108	110	112	107	104	101	101
2:49:00	105	104	110	110	105	109	112	97	92	101	88	94
2:50:00	97	100	100	105	100	107	114	114	106	109	105	105
2:51:00	109	105	105	105	104	103	103	105	107	102	109	105
2:52:00	110	110	110	114	107	105	105	107	111	111	103	106
2:53:00	93	95	93	98	92	97	100	105	101	102	98	101
2:54:00	95	99	93	101	106	105	101	92	97	96	98	100
2:55:00	98	99	97	101	98	101	102	105	97	94	96	100
2:56:00	109	111	120	120	107	102	100	100	99	101	99	99
2:57:00	95	99	100	100	100	104	107	107	104	98	100	100
2:58:00	103	99	100	99	100	115	111	96	97	103	110	104
2:59:00	103	100	94	91	89	89	89	94	90	93	91	93
3:00:00	92	91	91	94	89	88	88	88	87	88	92	93
3:01:00	91	94	90	94	90	91	90	94	95	98	94	94
3:02:00	94	92	90	94	96	95	93	90	91	92	94	100
3:03:00	101	98	91	95	95	94	95	94	97	94	97	91
3:04:00	93	90	92	91	91	91	101	104	100	96	97	101
3:05:00	98	100	94	94	91	90	92	91	91	93	95	96
3:06:00	92	93	92	96	97	96	94	92	94	92	93	91
3:07:00	94	93	98	95	95	93	93	94	92	91	91	92
3:08:00	93	93	94	91	92	92	97	91	91	91	89	91
3:09:00	91	91	89	92	93	98	91	93	89	91	93	92
3:10:00	93	95	94	99	90	92	95	97	93	102	105	100
3:11:00	95	93	90	88	91	98	94	93	90	95	93	95
3:12:00	94	100	105	100	94	92	89	93	94	95	96	94
3:13:00	94	94	90	92	91	94	97	95	93	99	90	87
3:14:00	89	91	94	93	95	105	112	105	101	102	97	99
3:15:00	104	106	106	98	95	97	99	103	94	95	89	87

Race 5

SUBJECT (12) LIGHT WINDS

Listing (5/8)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
3:16:00	87	88	89	90	93	93	93	92	95	93	94	97
3:17:00	96	96	93	96	94	98	99	94	90	92	93	95
3:18:00	95	96	93	96	95	99	96	94	95	96	97	97
3:19:00	96	92	94	95	93	91	92	94	97	93	94	91
3:20:00	95	95	101	99	99	97	97	101	103	104	97	95
3:21:00	96	95	98	102	98	98	96	97	97	99	97	99
3:22:00	97	96	102	100	102	99	100	94	97	92	93	98
3:23:00	97	98	96	98	100	100	105	112	100	93	88	89
3:24:00	94	96	103	107	102	98	98	93	99	107	103	102
3:25:00	104	93	97	94	99	98	108	100	98	95	95	94
3:26:00	95	97	97	94	93	92	97	95	93	97	98	100
3:27:00	102	103	100	101	99	102	108	107	107	105	103	102
3:28:00	104	108	111	104	100	103	108	108	103	103	105	99
3:29:00	99	100	102	99	100	103	102	105	108	116	125	120
3:30:00	117	114	114	107	108	99	106	114	105	104	103	110
3:31:00	103	105	102	103	93	100	105	105	100	105	107	107
3:32:00	97	99	102	102	100	103	101	100	104	109	116	112
3:33:00	107	100	102	104	103	101	105	107	109	111	114	110
3:34:00	103	105	107	116	123	118	119	116	119	116	113	106
3:35:00	104	106	108	103	114	122	119	122	123	121	126	129
3:36:00	126	122	127	130	130	129	130	132	132	133	133	130
3:37:00	125	129	133	132	131	133	123	123	121	127	136	128
3:38:00	119	122	121	124	122	127	133	120	115	115	110	107
3:39:00	104	105	105	98	99	103	105	110	103	104	100	103
3:40:00	99	101	102	101	107	102	100	96	97	100	100	101
3:41:00	92	97	101	107	112	117	111	103	102	100	99	97
3:42:00	99	105	104	102	96	94	88	92	90	96	92	101
3:43:00	102	109	115	107	108	103	103	100	97	107	112	108
3:44:00	100	102	104	101	101	99	101	108	107	106	107	101
3:45:00	100	101	102	109	119	120	112	114	120	109	114	115
3:46:00	118	114	108	112	115	109	112	116	108	105	100	100
3:47:00	106	104	100	102	105	107	106	106	100	108	115	115
3:48:00	120	124	134	141	144	145	150	150	155	160	167	171
3:49:00	176	179	179	178	176	173	169	157	152	136	133	136
3:50:00	126	124	130	129	128	122	112	112	112	118	109	113
3:51:00	114	107	108	108	115	114	118	117	123	116	103	107
3:52:00	108	111	104	112	100	96	102	102	104	101	109	116
3:53:00	107	105	97	102	106	105	107	99	102	104	112	105
3:54:00	105	102	102	105	104	99	102	105	102	105	110	114
3:55:00	108	104	109	114	110	111	101	107	110	120	129	123
3:56:00	125	120	126	126	123	114	121	124	128	123	112	116
3:57:00	119	114	116	103	105	118	115	114	102	101	102	102
3:58:00	98	107	105	102	102	104	99	100	102	106	110	109
3:59:00	113	112	113	118	109	107	115	121	125	134	144	151
4:00:00	156	158	157	155	154	154	151	151	154	154	150	152
4:01:00	148	145	147	147	147	148	144	141	136	138	141	132
4:02:00	137	131	140	141	137	138	136	138	137	139	137	134
4:03:00	136	139	132	134	139	134	135	133	133	133	129	134
4:04:00	134	140	138	140	133	133	131	129	130	134	135	139

Race 6

No data on this page

SUBJECT (12) LASER LIGHT WINDS

Listing (7/8)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55	
4:54:00	128	126	128	127	125	125	123	125	125	128	127	128	
4:55:00	129	125	129	129	132	131	133	127	130	125	126	130	
4:56:00	132	129	130	131	130	130	129	130	132	134	130	130	
4:57:00	131	129	129	125	127	126	129	127	128	127	127	124	
4:58:00	124	125	129	131	129	127	124	125	129	124	125	124	
4:59:00	122	124	122	126	122	125	119	124	125	124	125	125	
5:00:00	124	126	122	126	125	127	127	127	127	128	126	128	
5:01:00	126	122	125	128	127	126	123	125	123	120	119	124	
5:02:00	119	119	122	125	128	138	143	142	137	137	135	133	Race 6
5:03:00	131	124	129	123	122	118	119	110	109	111	112	119	
5:04:00	108	107	106	108	111	114	115	114	113	114	115	106	
5:05:00	112	120	121	126	127	119	120	110	116	104	103	110	
5:06:00	103	108	105	104	107	115	104	112	117	119	113	117	
5:07:00	117	118	121	119	117	118	121	129	127	120	123	125	
5:08:00	129	132	132	124	124	119	115	123	119	116	118	115	
5:09:00	119	122	108	103	102	98	102	92	100	97	105	96	
5:10:00	109	114	109	108	116	104	100	100	107	106	103	103	
5:11:00	108	106	109	104	100	100	114	117	106	110	104	106	
5:12:00	111	102	97	105	107	107	108	106	105	91	94	98	
5:13:00	106	94	100	92	94	104	100	92	91	95	105	107	
5:14:00	111	98	104	112	108	106	112	112	108	112	105	97	
5:15:00	98	101	104	104	95	98	96	98	93	99	109	121	
5:16:00	119	121	119	116	119	114	117	112	110	116	113	111	
5:17:00	108	105	111	113	118	106	101	108	108	109	113	115	
5:18:00	111	107	99	112	108	112	112	105	101	99	97	101	
5:19:00	99	108	104	112	99	95	99	95	101	97	97	101	
5:20:00	104	104	102	105	108	111	114	116	120	108	106	108	
5:21:00	106	102	105	105	103	102	100	103	102	110	106	103	
5:22:00	96	92	95	97	109	105	106	101	109	107	105	107	
5:23:00	112	107	105	100	103	102	103	98	110	99	103	105	
5:24:00	104	104	121	127	118	120	126	121	122	118	123	124	
5:25:00	120	118	118	110	111	106	112	105	99	97	99	104	
5:26:00	105	108	97	90	89	92	101	103	103	98	99	104	
5:27:00	101	96	95	92	94	102	97	99	99	103	105	96	
5:28:00	99	106	117	118	109	111	109	113	108	103	101	104	
5:29:00	101	102	102	103	105	98	99	98	96	100	105	101	
5:30:00	103	108	114	104	103	103	106	110	108	116	123	122	
5:31:00	105	109	102	104	103	92	96	96	97	92	92	92	
5:32:00	90	90	93	94	94	93	93	96	94	92	90	97	
5:33:00	93	93	93	92	90	92	93	91	92	91	90	89	
5:34:00	89	88	93	91	96	97	93	93	93	93	95	89	
5:35:00	91	93	98	96	97	99	106	108	110	109	111	115	
5:36:00	112	110	112	112	111	111	110	119	118	116	111	107	
5:37:00	106	105	107	107	107	104	112	120	117	118	113	116	
5:38:00	117	116	118	112	114	118	117	98	109	112	112	113	
5:39:00	119	118	117	114	118	123	113	113	108	111	110	106	
5:40:00	107	106	109	105	100	99	97	101	107	105	97	96	
5:41:00	97	97	96	103	99	107	112	110	112	116	116	117	
5:42:00	122	125	126	125	119	118	114	108	106	103	100	97	

SUBJECT (12) Laser MODERATE WINDS

Listing (5/7)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55	
3:16:00	103	107	99	98	98	95	99	98	108	103	101	103	
3:17:00	106	101	98	93	90	95	88	97	105	108	107	101	
3:18:00	101	102	106	101	97	91	95	98	102	100	95	89	
3:19:00	90	91	91	92	90	89	103	103	99	108	123	117	
3:20:00	118	117	119	116	115	118	118	120	126	125	117	120	
3:21:00	116	118	125	126	127	130	132	128	132	133	130	130	
3:22:00	127	124	118	114	105	104	110	112	104	97	104	110	
3:23:00	104	97	93	93	102	109	118	124	120	119	124	121	
3:24:00	114	106	111	114	112	110	119	124	118	102	103	107	
3:25:00	113	111	113	124	137	143	146	140	143	147	148	149	
3:26:00	152	154	158	160	161	160	160	161	161	159	156	157	
3:27:00	157	162	168	171	173	171	168	166	168	173	176	179	
3:28:00	181	182	180	179	176	173	171	169	167	164	159	159	
3:29:00	160	161	161	161	163	163	160	161	162	163	165	165	
3:30:00	166	168	169	169	168	170	169	168	167	167	167	169	Race 4
3:31:00	168	165	165	161	162	159	160	163	162	162	162	161	
3:32:00	162	164	164	163	159	160	159	160	162	163	165	166	
3:33:00	165	165	166	176	179	182	185	185	186	187	187	187	
3:34:00	186	187	185	185	184	182	183	182	182	183	182	182	
3:35:00	183	183	183	182	182	182	182	182	184	184	183	182	
3:36:00	182	183	183	181	179	179	178	177	179	180	180	182	
3:37:00	184	187	188	189	189	188	187	185	185	183	182	180	
3:38:00	179	178	178	178	178	177	176	179	182	185	187	188	
3:39:00	189	188	187	186	184	182	180	177	176	175	175	175	
3:40:00	173	173	171	170	171	174	178	181	181	181	181	181	
3:41:00	183	185	188	188	187	186	184	184	186	185	185	183	
3:42:00	181	179	179	179	178	179	178	176	175	176	178	179	
3:43:00	180	179	177	176	175	174	172	170	168	166	165	166	
3:44:00	165	166	168	169	169	167	169	165	164	165	165	166	
3:45:00	165	167	171	170	170	170	169	170	172	170	170	171	
3:46:00	172	171	169	167	167	166	166	169	169	169	168	168	
3:47:00	167	168	168	163	163	163	160	158	155	153	150	149	
3:48:00	146	145	146	145	147	151	149	150	150	149	148	147	
3:49:00	149	149	149	151	155	153	152	148	148	149	152	154	
3:50:00	154	152	155	152	152	154	152	152	155	151	151	150	
3:51:00	150	152	149	146	148	145	150	155	154	152	152	151	
3:52:00	152	150	150	152	151	153	149	151	151	156	156	155	
3:53:00	156	155	155	152	154	154	157	160	160	162	163	162	
3:54:00	157	157	154	156	158	158	156	156	155	154	158	162	
3:55:00	166	167	165	164	164	166	166	164	165	172	178	178	
3:56:00	178	179	181	181	181	182	182	181	179	178	178	178	
3:57:00	177	176	175	175	176	177	177	176	177	177	178	179	
3:58:00	182	184	184	183	183	183	181	181	180	181	183	186	
3:59:00	189	189	190	190	189	187	186	186	187	188	188	187	
4:00:00	187	188	188	187	186	184	184	184	184	184	183	183	
4:01:00	184	184	182	181	180	178	178	180	183	183	183	182	
4:02:00	183	183	183	183	184	183	184	185	185	187	187	187	
4:03:00	187	186	187	187	187	187	186	186	186	186	184	183	
4:04:00	183	181	184	184	184	184	185	184	184	185	185	184	

SUBJECT 12 LASER MODERATE WINDS

Race 4

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
4:05:00	185	184	183	183	183	183	182	182	181	182	182	182
4:06:00	182	182	182	184	187	189	190	191	191	191	190	190
4:07:00	190	189	189	188	187	186	185	185	184	183	184	184
4:08:00	185	186	187	187	187	188	189	189	188	186	185	184
4:09:00	186	188	189	190	190	190	190	190	190	190	191	192
4:10:00	193	193	191	191	190	189	188	186	184	182	181	180
4:11:00	178	175	173	171	170	169	168	169	170	171	171	172
4:12:00	173	175	175	176	176	177	177	178	177	177	176	175
4:13:00	174	173	173	173	171	173	173	173	172	170	169	169
4:14:00	170	172	173	173	173	174	176	175	174	173	173	172
4:15:00	171	171	172	173	173	172	171	173	172	171	171	171
4:16:00	172	172	171	170	169	170	173	174	175	178	179	180
4:17:00	180	181	182	182	182	185	187	190	193	194	195	195
4:18:00	198	199	200	201	201	201	201	201	201	202	203	203
4:19:00	202	201	199	196	194	191	188	186	182	178	174	171
4:20:00	167	165	159	158	154	155	138	143	146	146	141	142
4:21:00	143	137	137	133	134	134	135	134	131	131	136	120
4:22:00	130	129	129	126	129	132	133	135	134	134	139	143
4:23:00	144	146	147	152	157	159	159	157	154	153	149	142
4:24:00	140	140	140	138	141	139	141	143	145	144	143	139
4:25:00	137	140	136	139	137	139	140	141	143	145	141	142
4:26:00	142	137	133	133	131	132	134	131	130	126	128	127
4:27:00	127	128	124	125	131	133	133	135	132	130	131	128
4:28:00	130	124	129	129	131	123	128	127	124	128	125	132
4:29:00	129	128	126	126	124	121	119	124	127	124	126	120
4:30:00	122	118	120	124	123	123	120	124	124	126	123	124
4:31:00	122	124	119	123	124	125	125	127	126	128	120	126
4:32:00	122	125	121	119	118	122	119	123	124	126	127	125
4:33:00	122	123	122	124	124	124	122	121	121	119	123	121
4:34:00	118	120	119	118	123	123	123	117	118	114	116	118
4:35:00	118	116	116	118	117	119	119	114	115	117	118	115
4:36:00	115	118	115	117	113	115	114	115	114	118	116	115
4:37:00	115	115	114	115	112	116	117	113	115	115	115	113
4:38:00	113	111	114	109	112	111	109	111	112	115	110	110
4:39:00	113	113	114	113	111	112	109	110	108	110	111	112
4:40:00	109	108	107	109	109	109	110	109	109	110	108	110
4:41:00	109	112	109	111	105	107	107	110	111	109	109	106
4:42:00	109	108	107	107	105	104	105	103	104	104	103	104
4:43:00	104	106	107	105	107	104	103	103	104	102	99	103
4:44:00	107	108	107	109	108	109	111	109	113	112	113	111
4:45:00	113	113	116	111	113	114	111	111	112	111	114	112
4:46:00	112	112	112	116	117	107	105	108	107	109	105	109
4:47:00	109	108	109	101	107	107	111	109	112	113	117	119
4:48:00	118	120	123	120	120	122	124	124	121	118	114	117
4:49:00	118	118	118	119	116	117	118	119	120	119	106	106
4:50:00	104	109	105	102	98	100	107	104	106	110	114	112
4:51:00	112	115	119	115	109	107	106	104	101	109	101	100
4:52:00	103	105	104	106	110	101	101	100	104	104	104	99
4:53:00	102	104	103	100	99	99	102	105	100	102	108	103

SUBJECT 12 LASER – MODERATE WINDS

Listing (3/7)

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
1:38:00	158	151	149	146	141	138	134	132	133	132	133	123
1:39:00	122	124	114	119	118	115	113	114	119	116	119	121
1:40:00	116	117	116	120	118	114	108	106	108	108	104	104
1:41:00	105	104	111	110	109	109	116	115	115	115	120	125
1:42:00	127	129	129	125	133	140	137	142	151	155	148	142
1:43:00	137	134	125	119	116	110	107	105	101	101	102	102
1:44:00	101	100	103	105	101	100	119	123	109	113	114	121
1:45:00	118	115	113	122	120	112	108	111	113	119	119	120
1:46:00	119	109	102	97	94	93	92	96	90	97	104	107
1:47:00	112	102	100	108	118	116	111	110	117	125	127	131
1:48:00	131	133	136	138	139	136	133	129	126	127	123	123
1:49:00	117	126	118	109	111	114	114	113	109	120	127	128
1:50:00	130	130	131	138	138	137	135	141	139	145	147	154
1:51:00	159	168	172	172	173	176	180	182	183	184	183	183
1:52:00	183	184	183	180	180	181	181	180	181	179	178	176
1:53:00	177	179	178	176	177	177	176	176	178	181	181	178
1:54:00	178	179	179	178	175	176	176	175	176	177	175	174
1:55:00	173	173	173	170	171	169	169	169	171	174	173	172
1:56:00	173	174	172	172	172	172	174	173	172	171	171	170
1:57:00	170	169	173	179	181	181	184	184	184	184	186	188
1:58:00	191	193	196	196	196	195	194	193	192	190	190	190
1:59:00	189	189	188	185	184	184	182	182	181	181	179	179
2:00:00	180	180	177	179	181	181	181	181	181	180	180	180
2:01:00	179	178	178	175	172	170	167	167	167	168	167	166
2:02:00	163	160	161	164	168	171	170	170	172	174	176	175
2:03:00	175	174	173	172	171	169	168	165	165	161	158	157
2:04:00	158	158	156	156	155	153	154	154	152	154	150	149
2:05:00	151	152	151	151	149	148	149	151	145	147	152	157
2:06:00	161	164	165	167	170	173	175	177	179	181	181	180
2:07:00	179	177	175	173	172	172	171	172	172	170	170	169
2:08:00	169	170	172	173	174	173	170	169	168	168	168	169
2:09:00	169	167	168	172	171	171	172	173	174	175	174	173
2:10:00	173	168	165	164	158	159	159	158	155	157	154	151
2:11:00	150	149	149	150	149	148	150	153	153	152	151	150
2:12:00	150	150	155	151	149	146	145	148	149	149	150	154
2:13:00	153	153	152	148	150	149	150	148	149	147	148	149
2:14:00	145	147	143	143	145	147	145	148	149	147	148	148
2:15:00	151	152	153	154	151	154	152	151	154	154	155	157
2:16:00	158	154	153	148	148	147	150	151	146	146	142	142
2:17:00	141	141	143	147	148	152	149	146	149	153	156	162
2:18:00	168	170	170	169	168	168	171	174	176	177	177	177
2:19:00	176	176	178	179	179	179	178	176	174	171	171	170
2:20:00	170	170	169	169	171	171	169	166	165	165	163	161
2:21:00	160	160	162	157	157	158	160	161	160	157	159	159
2:22:00	159	154	155	156	156	156	156	155	149	148	152	153
2:23:00	152	152	155	159	164	166	166	166	165	165	164	163
2:24:00	164	167	169	169	167	164	164	166	170	171	171	169
2:25:00	167	165	165	157	155	152	148	151	153	154	150	152
2:26:00	152	154	155	151	150	152	155	158	157	158	160	163

Race (7)

SUBJECT (12) LASER IN MODERATE WINDS

Listing (4/7)

Race 7

Time	+0:00	+0:05	+0:10	+0:15	+0:20	+0:25	+0:30	+0:35	+0:40	+0:45	+0:50	+0:55
2:27:00	164	163	162	161	159	155	155	153	154	154	154	154
2:28:00	154	155	156	160	163	165	166	166	166	167	167	165
2:29:00	164	163	163	162	160	159	158	158	157	160	161	158
2:30:00	153	153	153	150	147	145	140	139	141	142	146	150
2:31:00	145	147	149	149	150	152	151	149	145	142	142	137
2:32:00	137	139	137	139	137	136	134	135	132	131	130	131
2:33:00	132	135	128	132	132	127	128	128	132	136	137	137
2:34:00	135	132	133	133	132	132	127	131	131	131	131	134
2:35:00	128	132	132	134	137	131	133	134	142	136	137	141
2:36:00	141	141	144	144	143	144	146	144	145	146	149	148
2:37:00	143	147	149	146	141	140	142	148	144	141	144	140
2:38:00	137	143	148	146	145	149	149	149	149	153	159	161
2:39:00	166	172	177	181	183	183	181	181	181	181	181	178
2:40:00	179	180	180	181	183	184	186	186	185	180	173	169
2:41:00	162	157	150	147	147	136	133	133	126	122	120	121
2:42:00	123	125	126	123	118	118	112	109	111	108	114	117
2:43:00	115	115	108	109	107	103	103	100	105	103	100	99
2:44:00	97	98	98	101	97	99	97	102	99	98	96	97
2:45:00	101	102	98	102	107	102	105	104	103	103	104	96
2:46:00	99	98	98	99	92	91	95	94	101	99	99	97
2:47:00	100	99	100	96	96	101	97	104	96	102	96	99
2:48:00	99	101	99	98	98	99	102	104	100	106	101	104
2:49:00	105	103	98	98	100	99	97	103	97	102	101	101
2:50:00	98	101	101	100	100	104	96	99	102	105	100	98
2:51:00	102	102	99	98	108	110	111	105	106	107	103	99
2:52:00	99	97	97	94	99	95	94	94	96	95	93	100
2:53:00	93	92	93	90	91	93	93	95	94	96	93	96
2:54:00	93	95	95	92	91	91	98	100	105	103	97	99
2:55:00	97	98	95	96	93	95	92	92	93	93	95	101
2:56:00	100	101	106	105	105	97	94	94	97	100	102	100
2:57:00	95	95	95	95	91	94	95	102	110	108	112	114
2:58:00	108	100	98	101	101	96	98	92	98	99	99	103
2:59:00	117	119	101	102	110	100	103	100	96	100	97	95
3:00:00	94	94	92	92	92	95	97	96	95	100	100	92
3:01:00	88	88	95	93	91	88	87	90	91	89	89	87
3:02:00	90	91	86	87	90	87	87	84	88	91	88	86
3:03:00	84	87	90	89	87	93	95	94	94	100	96	95
3:04:00	90	93	91	89	89	89	91	90	89	85	86	86
3:05:00	85	82	81	86	87	87	87	84	86	93	95	96
3:06:00	96	97	96	91	88	91	89	89	89	88	88	82
3:07:00	80	84	84	82	82	85	89	95	92	92	88	87
3:08:00	87	88	86	92	90	89	92	94	102	101	98	95
3:09:00	99	98	99	90	93	88	86	85	79	83	88	91
3:10:00	87	86	89	90	90	89	87	90	91	95	102	98
3:11:00	100	104	103	102	103	95	95	100	95	94	92	93
3:12:00	96	93	92	88	95	94	84	94	90	92	90	97
3:13:00	104	104	99	96	99	100	98	96	87	87	84	85
3:14:00	84	82	84	83	83	85	90	87	86	87	87	84
3:15:00	86	89	89	88	89	92	89	95	98	106	102	99

Listing (1/2)

SUBJECT 7: LASER STRONG WINDS

11/12/93

Time	+0:00	+0:15	+0:30	+0:45	+1:00	+1:15	+1:30	+1:45	+2:00	+2:15	+2:30	+2:45	
0:00:00	91	91	91	91	91	91	91	91	91	91	91	91	
0:03:00	91	91	91	96	81	82	100	88	90	81	83	83	
0:06:00	94	93	97	100	96	106	107	110	107	110	96	106	
0:09:00	106	107	107	98	94	87	99	84	95	106	111	105	
0:12:00	105	107	110	110	110	110	111	111	111	111	109	103	
0:15:00	100	100	101	80	97	93	89	91	92	103	94	96	
0:18:00	97	95	109	101	97	92	83	83	102	95	88	101	
0:21:00	111	112	110	114	114	108	102	92	94	109	108	107	
0:24:00	110	84	108	116	118	115	107	111	100	96	96	114	
0:27:00	104	105	100	101	117	107	102	104	87	92	96	85	
0:30:00	85	85	85	85	109	100	95	91	93	90	80	77	
0:33:00	80	79	81	80	74	84	89	84	83	75	81	81	
0:36:00	76	78	78	98	83	76	71	78	76	82	96	105	
0:39:00	107	89	103	97	84	71	61	78	74	79	92	84	
0:42:00	68	68	68	68	78	79	72	72	69	69	91	70	
0:45:00	72	76	94	70	64	76	76	104	109	106	108	108	
0:48:00	117	126	126	93	108	101	107	116	105	105	108	105	
0:51:00	102	111	119	127	134	142	140	138	136	135	133	131	
0:54:00	129	142	149	149	130	125	125	125	125	125	126	126	
0:57:00	123	121	122	123	130	128	128	145	144	146	152	152	
1:00:00	153	149	150	151	154	160	158	160	165	164	163	161	
1:03:00	147	149	144	147	131	126	124	124	129	123	123	147	
1:06:00	153	148	146	151	149	154	161	155	154	154	158	160	
1:09:00	160	160	159	157	156	141	133	115	113	115	114	115	
1:12:00	143	140	136	135	123	130	140	156	150	159	164	164	
1:15:00	171	169	168	169	169	171	171	171	172	172	172	166	Race 1
1:18:00	167	171	176	178	176	171	167	168	162	155	142	139	
1:21:00	137	144	139	141	135	131	140	149	147	141	144	146	
1:24:00	162	164	161	164	169	169	171	172	175	175	173	171	
1:27:00	165	165	168	167	164	165	165	153	144	137	131	129	
1:30:00	133	120	122	131	139	135	137	139	159	163	165	168	
1:33:00	167	165	166	168	171	170	168	167	171	169	167	163	Race 2
1:36:00	163	166	171	170	168	159	158	151	149	146	146	151	
1:39:00	153	147	156	151	149	152	156	162	172	169	166	165	
1:42:00	168	165	166	170	168	164	168	171	171	170	168	164	
1:45:00	166	167	154	143	135	126	119	118	121	127	131	123	
1:48:00	117	113	114	116	108	122	112	128	140	144	146	159	
1:51:00	157	159	160	160	159	161	158	161	161	162	158	160	
1:54:00	160	159	161	156	158	162	171	172	166	163	160	153	Race 3
1:57:00	148	144	144	147	149	150	155	159	164	166	160	155	
2:00:00	160	160	162	157	153	156	161	165	165	167	165	164	
2:03:00	165	165	166	165	166	161	160	153	142	130	115	119	
2:06:00	123	127	127	118	114	122	121	118	118	123	131	126	
2:09:00	129	132	138	129	135	130	119	123	132	136	144	148	
2:12:00	143	143	139	143	145	130	116	120	122	127	133	140	
2:15:00	141	150	149	141	130	124	118	122	124	126	123	117	
2:18:00	120	112	114	127	142	139	129	120	123	120	125	119	
2:21:00	109	94	91	89	98	109	107	105	106	116	94	91	
2:24:00	116	104	104	110	108	100	89	96	100	101	91	87	

Listing (1/2)

SUBJECT 7: LASER STRONG WINDS
12/12/93

Time	+0:00	+0:15	+0:30	+0:45	+1:00	+1:15	+1:30	+1:45	+2:00	+2:15	+2:30	+2:45	
0:00:00	0	81	90	95	88	96	95	99	105	96	92	88	
0:03:00	87	93	99	94	88	99	96	88	86	92	101	102	
0:06:00	104	108	108	110	111	102	105	106	108	107	103	85	
0:09:00	83	79	92	103	101	101	103	98	109	105	104	99	
0:12:00	103	98	103	90	109	110	99	101	99	97	87	94	
0:15:00	89	77	94	82	85	81	78	92	83	77	90	97	
0:18:00	87	91	91	85	81	81	83	84	80	91	90	79	
0:21:00	87	103	110	111	114	105	104	100	113	115	104	105	
0:24:00	103	105	95	96	117	114	110	100	103	97	90	91	
0:27:00	97	93	93	107	105	106	102	109	99	101	101	105	
0:30:00	110	105	99	94	88	92	94	107	105	101	103	93	
0:33:00	116	103	110	113	118	115	129	126	113	103	103	103	
0:36:00	90	115	124	106	110	111	113	111	107	106	122	104	
0:39:00	115	114	110	111	117	125	122	118	117	125	106	113	
0:42:00	107	121	132	140	144	145	146	152	155	157	158	154	
0:45:00	142	134	143	141	133	126	118	122	125	126	136	145	
0:48:00	146	150	152	147	148	154	151	143	138	140	148	148	
0:51:00	152	151	152	152	148	133	139	148	152	153	153	149	
0:54:00	152	153	155	153	152	154	149	149	149	151	150	147	
0:57:00	147	148	148	146	148	142	144	148	145	144	147	139	
1:00:00	143	145	149	149	148	148	143	136	135	133	132	132	
1:03:00	133	139	140	130	137	142	136	141	145	136	132	124	
1:06:00	119	112	110	111	119	115	123	121	115	114	112	117	
1:09:00	108	112	108	115	115	116	113	111	109	115	112	127	
1:12:00	114	109	111	105	96	106	111	114	126	126	129	126	
1:15:00	130	128	133	126	114	108	113	111	107	99	104	112	
1:18:00	117	114	113	98	105	100	101	99	95	96	119	114	
1:21:00	107	106	103	94	95	95	98	96	110	103	98	98	
1:24:00	96	99	102	87	103	125	110	108	102	111	132	146	
1:27:00	145	143	136	132	131	118	128	131	123	137	153	160	
1:30:00	161	159	163	165	164	163	164	165	169	170	166	166	Race 1
1:33:00	171	175	176	176	180	179	178	179	181	182	181	181	
1:36:00	181	182	183	181	182	178	179	180	180	181	181	183	
1:39:00	184	179	179	176	171	174	171	165	158	157	155	154	
1:42:00	156	155	155	154	156	159	162	159	161	163	165	165	
1:45:00	168	168	174	173	169	167	165	165	166	167	167	167	
1:48:00	168	169	173	174	172	173	173	171	173	172	168	163	
1:51:00	163	161	160	160	158	157	159	156	158	162	166	161	
1:54:00	158	157	151	147	145	143	143	144	149	161	159	159	
1:57:00	156	156	158	150	148	139	135	131	131	125	119	117	
2:00:00	111	114	111	112	116	119	110	111	112	122	126	116	
2:03:00	118	113	106	105	109	112	113	113	99	113	112	109	
2:06:00	116	126	116	120	116	130	139	142	154	153	156	157	
2:09:00	158	158	157	158	159	167	166	165	165	163	166	165	Race 2
2:12:00	165	165	165	165	166	165	164	166	168	168	162	160	
2:15:00	161	164	165	164	160	165	166	165	164	165	167	166	
2:18:00	164	170	174	173	171	169	164	162	157	156	161	163	
2:21:00	169	165	166	173	168	156	152	141	126	130	127	127	
2:24:00	121	121	120	119	125	109	118	114	122	121	121	125	

Chapter 4: On-water measures of single-handed dinghy sailing.

Anthropometric and physiological profiles for Laser and Finn subjects of Chapter 4

Chapter 4

Physilogical profile: Laser Sailors (N=20)

Name	test	age	height	weight	BMI	fat %	VO2 @OBLA	Power @ OBLA	VO2 max	HR Max
1	bike	22.4	1.82	80.4	24.3	10	48.3	3.46 w/kg	58.7	193
2	run	31.3	1.73	77.1	25.8	13.5	44.1	14	51.9	191
3	run	32.6	1.835	79.2	23.5	9.4	51.5	14.9	60.9	202
4	run	19.7	1.81	88.1	26.9	14.5	43.1	12.5	50.8	214
5	run	21	1.87	79.4	22.7	8.8	56.7	15.8	71.1	188
6	bike	18.2	1.78	77.6	24.5	15.1	37.4	3.68 w/kg	53.9	191
7	run	20	1.775	78.4	24.9	14	55	14.8	65.2	194
8	bike	18	1.825	78.5	23.6	11.6	44.7	3.29 w/kg	57.5	207
9	bike	17.6	1.835	79.5	23.6	15.2	38.9	2.73 w/kg	47.4	193
10	bike	27.7	1.81	79.1	24.1	15.3	46.5	3.52 w/kg	58.5	191
11	row	32.5	1.78	77.2	24.4	12.2	52.6	2.96 w/kg	62.4	189
12	bike	20	1.84	80.9	24	15	52.5	4.10 w/kg	59.8	197
13	bike	22	1.88	77.7	22	12.9	48.3	3.54 w/kg	59.2	195
14	bike	19.1	1.855	80.4	23.4	13.7	40.9	2.48 w/kg	52.7	202
15	run	27.8	1.79	82.8	25.8	15.3	48.3	13.4	56.9	194
16	run	20.4	1.835	77	22.9	13.7	55.6	16.3	64.8	192
17	bike	20.7	1.76	83.8	27.1	16.2	48.7	3.82 w/kg	64	191
18	bike	17.1	1.896	71.8	20	9	47.6	3.8 w/kg	58.2	188
19	run	18.5	1.775	77.3	24.5	12	50	12.6	58.1	200
20	bike	31	1.79	76.5	23.9		36.6	2.5 w/kg	45.8	182
		age	**height**	**weight**	**BMI**	**fat %**	**VO2 @OBLA**	**Power @ OBLA**	**VO2 max**	**HR Max**
MEAN		**22.88**	**1.81**	**79.14**	**24.10**	**13.02**	**47.37**	**3.23 ± 0.52 w/kg**	**57.89**	**194.70**
S.D.		**5.40**	**0.04**	**3.28**	**1.62**	**2.33**	**5.90**	**14.37 ± 1.27 km/h**	**6.22**	**7.31**

Physilogical profile: Finn Sailors (N=13)

	Name	test	age	height	weight	BMI	fat %	VO 2 @OBLA	Power @ OBLA	Max HR	VO2 max
1		row	24.3	1.855	101.3	29.4	20.2	40.6	2.63 w/kg	202	49.6
2		row	32.8	1.79	95.9	29.9	15.6	40	2.77 w/kg	196	47.5
3		run	26.5	1.825	95.3	28.6	19.2	48	13.5 km/h	195	59.3
4		bike	22	1.825	94.6	28.2	21.3	35	2.55 w/kg	201	46.7
5		row	21.1	1.955	102.8	27	14	48.5	3.26 w/kg	194	56.7
6		bike	24.4	1.865	95.1	27.3	12.8	46.2	3.24 w/kg	183	56.7
7		bike	26.5	1.83	100.1	30	22.7	39.6	3.03 w/kg	205	45.2
8		run	32	1.87	103.1	29.5	21.1	44	13.3 km/h	184	51
	MEAN		**26.2**	**1.85**	**98.5**	**28.7**	**18.4**	**42.7**	**2.77 ± 0.40 w/kg**	**195.0**	**51.6**
	SD		**4.27**	**0.05**	**3.66**	**1.16**	**3.72**	**4.72**	**13.1 ± 0.47 km/h**	**8.04**	**5.31**

APPENDIX D

(relevant to chapter 5)

Chapter 5: Static simulation of dinghy sailing.

Subject 1.

SUBJECT 1

Name: Female 1
Date 29/1/97
Height 172.0
Weight 70.0 kg

Pressure 779.0
Temp 19.2

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	2980	~~103~~ 82	28.2 =5.4	18.22	2.52	19.2	1.20	120/84	6
5	—	103	—	–	–	—	—	140/90	12
10	60.0	114	12.9	18.18	2.62	19.2	1.15	150/92	14
15	–	104	–	–	–	–	—	156/92	13
20	60.0	100	13.2	18.20	2.59	19.2	1.45	172/88	14
25	–	102	–	—	–	–	—	172/94	15
30	60.0	104	14.6	18.34	2.48	19.2	1.52	172/96	17
Post	–	97	–					124/92	—

Hiking error:

83,101

Heart Rate		coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
82	REST	REST	298	28.2	0.6	18.22	2.52	19.2	779	1	70	16.7
114		1	60	12.9	0.6	18.18	2.62	19.2	779	1	70	16.7
100		2	60	13.2	0.6	18.2	2.59	19.2	779	1	70	16.7
104		3	60	14.6	0.6	18.34	2.48	19.2	779	1	70	16.7

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
6.4	5.4	0.15	0.13	**0.890**	**2.2**	36.0	40.5	**82**	**1.2**
14.9	12.7	0.35	0.33	**0.918**	**5.1**	35.7	38.9	**114**	**1.15**
15.2	12.9	0.36	0.33	**0.913**	**5.1**	35.9	39.4	**100**	**1.45**
16.8	14.2	0.38	0.35	**0.922**	**5.4**	38.0	41.2	**104**	**1.52**

Subject 1: Female Europe
70.0 kg
Static hiking simulation
29th Jan 97

Chapter 5: Static simulation of dinghy sailing.

Subject 2.

SUBJECT 2

Name: Female 2
Date 22/1/97
Height 178.0 cm
Weight 67.0 kg

Pressure 770.0
Temp 18.9

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	277.1	77	22.8 = 4.7	16.20	3.80	18.9	1.38	102/66	6
5	–	100						126/90	10
10	60.0	99	11.6 ~~12.9~~	17.00 ~~18.78~~	3.31 ~~2.5~~	18.9	1.60	134/92	13
15	–	102						137/94	13
20	60.0	94	11.5 ~~15.2~~	16.87 ~~18.20~~	3.45	18.9	1.71	138/92	14
25	–	100						132/90	16
30	60.0	107	~~14.6~~ 13.6	17.26 ~~18.34~~	2.90	18.9	~~2.5~~ 2.15	136/90	15
Post		76						106/80	–

Hiking error:
38048

Heart Rate		coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
77	REST	REST	277.1	22.8	0.6	16.2	3.8	18.9	770	1	67	16.3
99		1	60	11.6	0.6	17	3.31	18.9	770	1	67	16.3
94		2	60	11.5	0.6	16.87	3.45	18.9	770	1	67	16.3
107		3	60	13.6	0.6	17.26	2.9	18.9	770	1	67	16.3

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
5.6	4.7	0.23	0.18	0.751	3.5	20.0	26.7	77	1.38
13.5	11.3	0.47	0.37	0.793	6.9	24.3	30.7	99	1.6
13.4	11.2	0.48	0.38	0.802	7.1	23.6	29.4	94	1.71
15.7	13.2	0.51	0.38	0.733	7.6	25.7	35.1	107	2.15

Subject 2: Female Europe
67.0 kg
Static hiking simulation
22nd Jan 97

Chapter 5: Static simulation of dinghy sailing.

Subject 3.

SUBJECT 3

Name: (FEMALE 3)
Date 22/11/97
Height 168.0
Weight 69.9

Pressure 779.0
Temp 19.2

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	295.1	80	22.6 = 4.4	17.00 ~~18.90~~	4.01	189	1.40	128/88	6
5	—	112	—	—	—	—	—	126/98	9
10	60.0	120	9.9	17.75	3.22	189	1.90	144/96	10
15	—	112	—	—	—	—	—	149/94	13
20	60.0	114	13.7	18.43	2.54	18.9	1.75	148/94	13
25	—	111	—	—	—	—	—	150/94	14
30	60.0	107	9.9	17.50	3.26	18.9	1.56	154/94	14
Post		93						128/84	—

Hiking error:

52 505

Heart Rate		coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
80	REST	REST	295.1	22.6	0.6	17	4.01	18.9	779	1	69.9	16.3
120		1	60	9.9	0.6	17.75	3.22	18.9	779	1	69.9	16.3
114		2	60	13.7	0.6	18.43	2.54	18.9	779	1	69.9	16.3
107		3	60	9.9	0.6	17.5	3.26	18.9	779	1	69.9	16.3

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
5.2	4.4	0.17	0.18	**1.009**	**2.5**	25.5	25.3	**80**	1.4
11.6	9.9	0.31	0.31	**0.995**	**4.5**	31.4	31.5	**120**	**1.9**
15.8	13.4	0.34	0.33	**0.994**	**4.8**	39.9	40.2	**114**	**1.75**
11.6	9.9	0.34	0.32	**0.920**	**4.9**	28.6	31.2	**107**	**1.56**

Subject 3: Female Europe

Static hiking simulation
22nd Jan 1997

Chapter 5: Static simulation of dinghy sailing.

Subject 4.

SUBJECT 4

Name: - Male 1
Date 22/1/97
Height 1.75
Weight 78.2

Pressure 779
Temp 18.8

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	2889	75	51.1 = 10.1	17.68	3.21	18.8	1.52	120/80	6
5		101						138/102	12
10	60	107	17.6	17.06	3.75	18.8	2.08	154/106	13
15		113						170/110	14
20	60	112	16.8	16.70	4.00	18.8	1.84	174/110	15
25		114						174/108	15
30	60	113	17.6	16.90	3.80	18.8	1.76	174/108	16
Post		78						134/84	-

Hiking error:
39453

Heart Rate		coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
75	REST	REST	288.9	51.1	0.6	17.68	3.21	18.8	779	1	78.2	16.2
107		1	60	17.6	0.6	17.06	3.75	18.8	779	1	78.2	16.2
112		2	60	16.8	0.6	16.7	4	18.8	779	1	78.2	16.2
113		3	60	17.6	0.6	16.9	3.8	18.8	779	1	78.2	16.2

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
11.9	10.1	0.33	0.32	**0.965**	**4.2**	30.5	31.6	**75**	**1.52**
20.1	17.1	0.67	0.63	**0.944**	**8.6**	25.5	27.0	**107**	**2.08**
19.3	16.3	0.70	0.65	**0.917**	**9.0**	23.2	25.3	**112**	**1.84**
20.1	17.1	0.70	0.64	**0.913**	**9.0**	24.4	26.7	**113**	**1.76**

Subject 4: Male Laser 1
78.2 kg
Static hiking simulation
22nd Jan 1997

Chapter 5: Static simulation of dinghy sailing.

Subject 5.

SUBJECT 5

Name: (Male 2)
Date 28/2/97
Height 173.0
Weight 78.6kg

Pressure 766
Temp 17.9

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	298.6	81	52.0 =9.8	17.60	2.91	17.9	1.1	122/72	6
5	—	87	←					150/102	12
10	60.0	92	17.6	17.08	3.46	17.9	1.01	160/106	12
15	—	96						172/108	13
20	60.0	99	17.9	17.20	3.64	17.9	1.29	188/102	14
25	—	101						168/86	14
30	60.0	104	19.6	17.27	3.62	17.9	1.39	176/88	13
Post		85						124/70	—

Hiking error:
46891

Heart Rate		coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
81	REST	REST	298.6	52	0.6	17.6	2.91	17.9	766	1	78.6	15.4
92		1	60	17.6	0.6	17.08	3.46	17.9	766	1	78.6	15.4
99		2	60	17.9	0.6	17.2	3.64	17.9	766	1	78.6	15.4
104		3	60	19.6	0.6	17.27	3.62	17.9	766	1	78.6	15.4

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
11.8	9.8	0.34	0.28	**0.827**	**4.3**	28.9	35.0	**81**	**1.1**
20.2	16.9	0.67	0.58	**0.859**	**8.5**	25.2	29.3	**92**	**1.01**
20.6	17.1	0.65	0.62	**0.952**	**8.2**	26.5	27.9	**99**	**1.29**
22.5	18.7	0.69	0.67	**0.968**	**8.8**	27.1	28.0	**104**	**1.39**

Subject 5: Male Laser 2
78.6 kg
Static hiking simulation
28th Feb 1997

Chapter 5: Static simulation of dinghy sailing.

Subject 6.

SUBJECT 6

Name: (Male 3)
Date 28/2/97
Height 182.0
Weight 77.0kg

Pressure 765.5
Temp 17.6

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	298.0	64	67.4 = 12.7	17.80	2.99	17.6	1.24	122/78	6
5	—	78						136/88	12
10	60.0	84	18.3	17.85	3.12	17.6	0.72	146/90	12
15	—	78						138/96	14
20	60.0	84	19.9	18.19	2.84	17.6	0.72	144/90	14
25	—	90						140/96	14
30	60.0	90	209	17.93	2.75	17.6	0.82	144/94	15
Post		68						124/70	—

Hiking error:

40 414

Heart Rate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
64	REST	298	67.4	0.6	17.8	2.99	17.6	765.5	1	77	15.1
84	1	60	18.3	0.6	17.85	3.12	17.6	765.5	1	77	15.1
84	2	60	19.9	0.6	18.19	2.84	17.6				15.1
90	3	60	20.9	0.6	17.93	2.75	17.6				15.1

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
15.3	12.7	0.40	0.37	**0.924**	**5.2**	31.4	34.0	**64**	**1.24**
21.1	17.5	0.54	0.54	**0.995**	**7.0**	32.4	32.6	**84**	**0.72**
22.8	19.0	0.52	0.53	**1.022**	**6.7**	36.6	35.8	**84**	**0.72**
24.0	19.9	0.61	0.54	**0.876**	**8.0**	32.4	37.0	**90**	**0.82**

Subject 6: Male Laser 3
77.0 kg
Static hiking simulation
28th Feb 1997

Chapter 5: Static simulation of dinghy sailing.

Subject 7.

SUBJECT 7

Name: -Male 4
Date 22/1/97
Height 1.84
Weight 76.1 kg

Pressure 766
Temp 18.1

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	300.4	77 ~~83~~	28.3 =5.3	15.93	4.40	18.1	0.99	128 82	6
5	—	106						130 92	12
10	60.0	100	12.4	17.54	2.85	18.1	1.12	134 92	13
15	—	103						142 94	13
20	60.0	105	11.8	17.58	2.77	18.1	0.80	144 90	15
25	—	102						156 90	16
30	60.0	100	15.3	16.85	3.50	18.1	0.97	156 90	17
Post		83						136 72	+

Hiking error:
76825

Heart Rate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
77	REST	300.4	28.3	0.6	15.93	4.4	18.1	766	1	76.1	15.5
100	1	60	12.4	0.6	17.54	2.85	18.1	766	1	76.1	15.5
105	2	60	11.8	0.6	17.58	2.77	18.1	766	1	76.1	15.5
100	3	60	15.3	0.6	16.85	3.5	18.1	766	1	76.1	15.5

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
6.4	5.3	0.28	0.23	**0.841**	**3.6**	19.3	23.0	**77**	**0.99**
14.4	12.0	0.43	0.34	**0.789**	**5.6**	28.2	35.7	**100**	**1.12**
13.8	11.5	0.40	0.31	**0.773**	**5.3**	28.4	36.8	**105**	**0.8**
17.7	14.7	0.63	0.51	**0.812**	**8.2**	23.5	29.0	**100**	**0.97**

Subject 7: Male Laser 4
76.1 kg
Static hiking simulation
22nd Jan 1997

Chapter 5: Static simulation of dinghy sailing.

Subject 8.

SUBJECT 8

Name: -Male 5
Date 29/1/97
Height 1.85m
Weight 76.0

Pressure 770
Temp 188

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	361.5	64	82.3 = 12.8	18.05	2.75	18.8	1.22	110/82	6
5	—	73						142/90	13
10	60.0	79	19.7	16.9	3.92	18.8	1.79	158/106	13
15	—	79						152/108	15
20	60.0	79	20.8	17.2	3.73	18.8	2.11	170/90	15
25	—	81						166/100	15
30	60.0	86	18.4	17.33	3.53	18.8	1.58	170/100	15
Post		58						108/80	

Hiking error:
56041

Heart Rate		coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
64	REST	REST	361.5	82.3	0.6	18.05	2.75	18.8	770	1	76	16.2
79		1	60	19.7	0.6	16.9	3.92	18.8	770	1	76	16.2
79		2	60	20.8	0.6	17.2	3.73	18.8	770	1	76	16.2
86		3	60	18.4	0.6	17.33	3.53	18.8	770	1	76	16.2

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
15.2	12.8	0.37	0.34	**0.921**	**4.9**	34.1	37.0	**64**	**1.22**
22.5	18.8	0.77	0.73	**0.950**	**10.1**	24.5	25.8	**79**	**1.79**
23.7	19.9	0.74	0.73	**0.982**	**9.8**	26.7	27.2	**79**	**2.11**
21.0	17.6	0.64	0.61	**0.958**	**8.4**	27.5	28.7	**86**	**1.58**

Subject 8: Male Laser 5
76.0 kg
Static hiking simulation
29th Jan 97

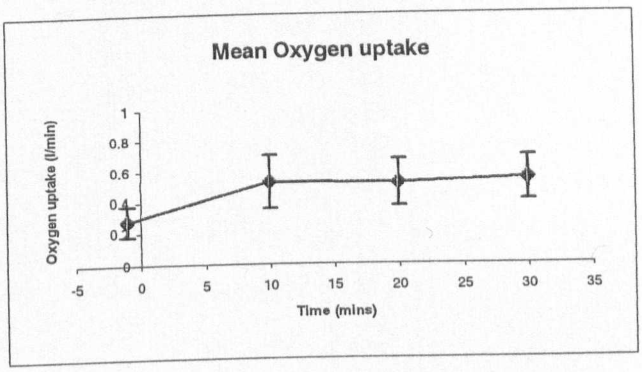
Chapter 6: Dynamic simulation: Statistical analysis

Systolic	rest	5 min	10 min	15 min	20 min	25 min	30 min	post
Sub 1	120	140	150	156	172	172	172	124
sub 2	102	126	134	137	138	132	136	106
sub 3	128	126	144	149	148	150	154	128
sub 4	120	138	154	170	174	174	174	134
sub 5	122	150	160	172	168	168	176	124
sub 6	122	136	146	138	144	140	144	124
sub 7	128	130	134	142	144	156	156	136
sub 8	110	142	158	152	170	166	170	108
Av	**119**	**136**	**147.5**	**152**	**157.25**	**157.25**	**160.25**	**123**
SD	**8.9**	**8.3**	**10.0**	**13.5**	**15.0**	**15.5**	**15.0**	**10.9**

Diastolic	rest	5 min	10 min	15 min	20 min	25 min	30 min	post
Sub 1	84	90	92	92	88	94	96	92
sub 2	66	90	92	94	92	90	90	80
sub 3	88	98	96	94	94	94	94	84
sub 4	80	102	106	110	110	108	108	84
sub 5	72	102	106	108	102	86	88	70
sub 6	78	88	90	96	90	96	94	70
sub 7	82	92	92	94	90	90	90	72
sub 8	82	90	106	108	90	100	100	80
Av	**79**	**94**	**97.5**	**99.5**	**94.5**	**94.75**	**95**	**79**
SD	**7.0**	**5.8**	**7.2**	**7.7**	**7.6**	**6.8**	**6.5**	**7.9**

Oxygen uptakes

VO2's	Pre	10 mins	20 mins	30 mins
Sub 1	0.15	0.35	0.36	0.38
sub 2	0.23	0.47	0.48	0.51
sub 3	0.17	0.31	0.34	0.34
sub 4	0.33	0.67	0.70	0.70
sub 5	0.34	0.67	0.65	0.69
sub 6	0.4	0.54	0.52	0.54
sub 7	0.28	0.43	0.40	0.63
sub 8	0.37	0.77	0.72	0.64
Av	**0.28**	**0.53**	**0.52**	**0.55**
SD	**0.1**	**0.17**	**0.15**	**0.14**



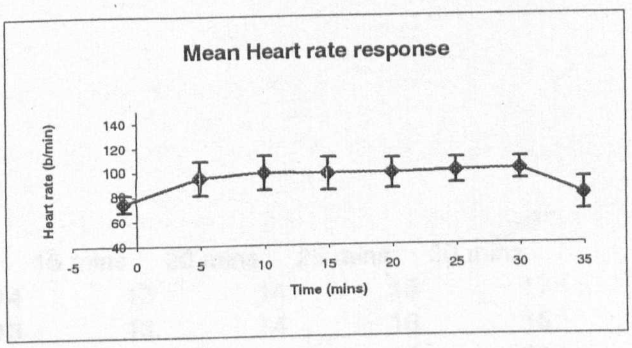
Mean VO2's

Time	Average	SD
-1	0.28	0.1
10	0.53	0.17
20	0.52	0.15
30	0.55	0.14

Heart rates

HR	5 min	10 min	15 min	20 min	25 min	30 min	post	Rest
Sub 1	103	114	104	100	102	104	97	82
sub 2	100	99	102	94	100	107	76	77
sub 3	112	120	112	114	111	107	93	80
sub 4	101	107	113	112	114	113	78	75
sub 5	87	92	96	99	101	104	85	81
sub 6	78	84	78	84	90	90	68	64
sub 7	106	100	103	105	102	100	83	77
sub 8	73	79	79	79	81	86	58	64
Av	**95**	**99**	**98**	**98**	**100**	**101**	**80**	**75**
SD	**14.0**	**14.2**	**13.4**	**12.4**	**10.6**	**9.1**	**12.8**	**7.2**

Mean HR'	Average	SD
-1	75	7
5	95	14
10	99	14
15	98	13
20	98	12
25	100	11
30	101	9
35	80	13



Mean Heart rate response

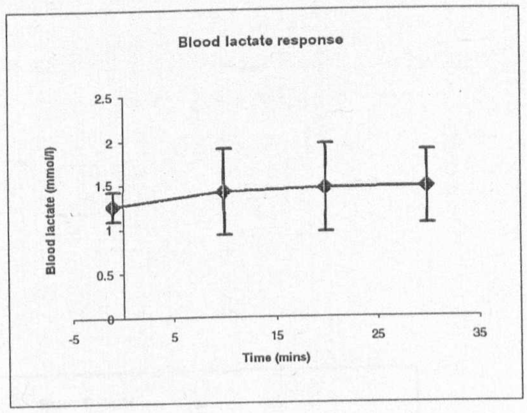
RER Values

RER	10 mins	20 mins	30 mins
Sub 1	0.918	0.913	0.922
sub 2	0.793	0.802	0.733
sub 3	0.995	0.994	0.920
sub 4	0.944	0.917	0.913
sub 5	0.859	0.952	0.968
sub 6	0.995	1.022	0.876
sub 7	0.789	0.773	0.812
sub 8	0.950	0.982	0.958
Av	**0.905**	**0.919**	**0.888**
SD	**0.08**	**0.09**	**0.08**

Mean REF	average	SD
10	0.91	0.08
20	0.92	0.09
30	0.89	0.08

Blood Lactate

	rest	10	20	30
Sub 1	1.2	1.15	1.45	1.52
sub 2	1.38	1.6	1.71	2.15
sub 3	1.4	1.9	1.75	1.56
sub 4	1.52	2.08	1.84	1.76
sub 5	1.1	1.01	1.29	1.39
sub 6	1.24	0.72	0.72	0.82
sub 7	0.99	1.12	0.8	0.97
sub 8	1.22	1.79	2.11	1.58
AV	**1.26**	**1.42**	**1.46**	**1.47**
SD	**0.17**	**0.49**	**0.50**	**0.42**



Mean Blood lactates

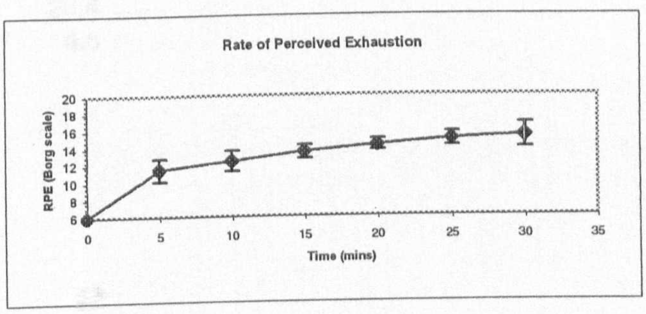
-1	1.26	0.17
10	1.42	0.49
20	1.46	0.5
30	1.47	0.42

Rate perceived exhaustion

	REST	5 mins	10 mins	15 mins	20 mins	25 mins	30 mins
Sub 1	6	12	14	13	14	15	17
sub 2	6	10	13	13	14	16	15
sub 3	6	9	10	13	13	14	14
sub 4	6	12	13	14	15	15	16
sub 5	6	12	12	13	14	14	13
sub 6	6	12	12	14	14	14	15
sub 7	6	12	13	13	15	16	17
sub 8	6	13	13	15	15	15	15
Av	**6.0**	**11.5**	**12.5**	**13.5**	**14.3**	**14.9**	**15.3**
SD	**0.0**	**1.3**	**1.2**	**0.8**	**0.7**	**0.8**	**1.4**

Mean RPE's

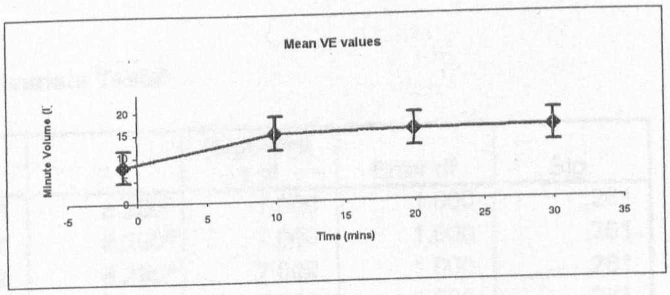
	Average	SD
0	6	0
5	11.5	1.3
10	12.5	1.2
15	13.5	0.8
20	14.3	0.6
25	14.9	0.8
30	15.3	1.4



VE	Rest	10 min	20 min	30 min
Sub 1	5.4	12.9	13.2	14.6
sub 2	4.7	11.6	11.5	13.6
sub 3	4.4	9.9	13.7	9.9
sub 4	10.1	17.6	16.8	17.6
sub 5	9.8	17.6	17.9	19.6
sub 6	12.9	18.3	19.9	20.9
sub 7	5.3	12.4	11.8	15.3
sub 8	12.8	19.7	20.8	18.4
AV	**8.2**	**15.0**	**15.7**	**16.2**
SD	**3.6**	**3.7**	**3.6**	**3.6**

Mean VE

-1	8.2	3.6
10	15	3.7
20	15.7	3.6
30	16.2	3.6



Ventialatory equivalents for O2

	Rest	10 mins	20 mins	30 mins
sub 1	36	35.7	35.9	38
sub 2	20	24.3	23.6	25.7
sub 3	25.5	31.4	39.9	28.6
sub 4	30.5	25.5	23.2	24.4
sub 5	28.9	25.2	26.5	27.1
sub 6	31.4	32.4	36.6	32.4
sub 7	19.3	28.2	28.4	23.5
sub 8	34.1	24.5	26.7	27.5
Av	**28.2**	**28.4**	**30.1**	**28.4**
SD	**6.2**	**4.3**	**6.4**	**4.8**

General Linear Model

Anova

Chapter 5

Within-Subjects Factors

Measure: MEASURE_1

TIME	Dependent Variable
1	REST
2	FIVE
3	TEN
4	FIFTN
5	TWENTY
6	TWENTYF
7	THIRTY
8	POST

Multivariate Tests[b]

Effect		Value	F	Hypothesis df	Error df	Sig.
TIME	Pillai's Trace	.983	8.290[a]	7.000	1.000	.261
	Wilks' Lambda	.017	8.290[a]	7.000	1.000	.261
	Hotelling's Trace	58.032	8.290[a]	7.000	1.000	.261
	Roy's Largest Root	58.032	8.290[a]	7.000	1.000	.261

a. Exact statistic

b.

Design: Intercept
Within Subjects Design: TIME

Mauchly's Test of Sphericity[b]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.
TIME	.000	57.896	27	.002

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

Mauchly's Test of Sphericity[b]

Measure: MEASURE_1

Within Subjects Effect	Epsilon[a] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
TIME	.291	.411	.143

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

b.
Design: Intercept
Within Subjects Design: TIME

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
TIME	Sphericity Assumed	14571.438	7	2081.634	31.085	.000
	Greenhouse-Geisser	14571.438	2.034	7162.208	31.085	.000
	Huynh-Feldt	14571.438	2.875	5068.300	31.085	.000
	Lower-bound	14571.438	1.000	14571.438	31.085	.001
Error(TIME)	Sphericity Assumed	3281.313	49	66.966		
	Greenhouse-Geisser	3281.313	14.241	230.406		
	Huynh-Feldt	3281.313	20.125	163.046		
	Lower-bound	3281.313	7.000	468.759		

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	TIME	Type III Sum of Squares	df	Mean Square	F	Sig.
TIME	Linear	1607.813	1	1607.813	26.582	.001
	Quadratic	10530.241	1	10530.241	41.045	.000
	Cubic	952.047	1	952.047	18.103	.004
	Order 4	1079.066	1	1079.066	21.713	.002
	Order 5	298.050	1	298.050	22.826	.002
	Order 6	55.381	1	55.381	5.014	.060
	Order 7	48.840	1	48.840	1.928	.208
Error(TIME)	Linear	423.390	7	60.484		
	Quadratic	1795.866	7	256.552		
	Cubic	368.142	7	52.592		
	Order 4	347.873	7	49.696		
	Order 5	91.402	7	13.057		
	Order 6	77.324	7	11.046		
	Order 7	177.316	7	25.331		

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1327680.1	1	1327680.1	1721.964	.000
Error	5397.187	7	771.027		

APPENDIX E

(relevant to chapter 6)

Chapter 6: Dynamic simulation of dinghy sailing.

Subject 1.

30 min Sailing Simulation

Name: Sub 1
Date 13/11/98
Height 1.790
Weight 81.4

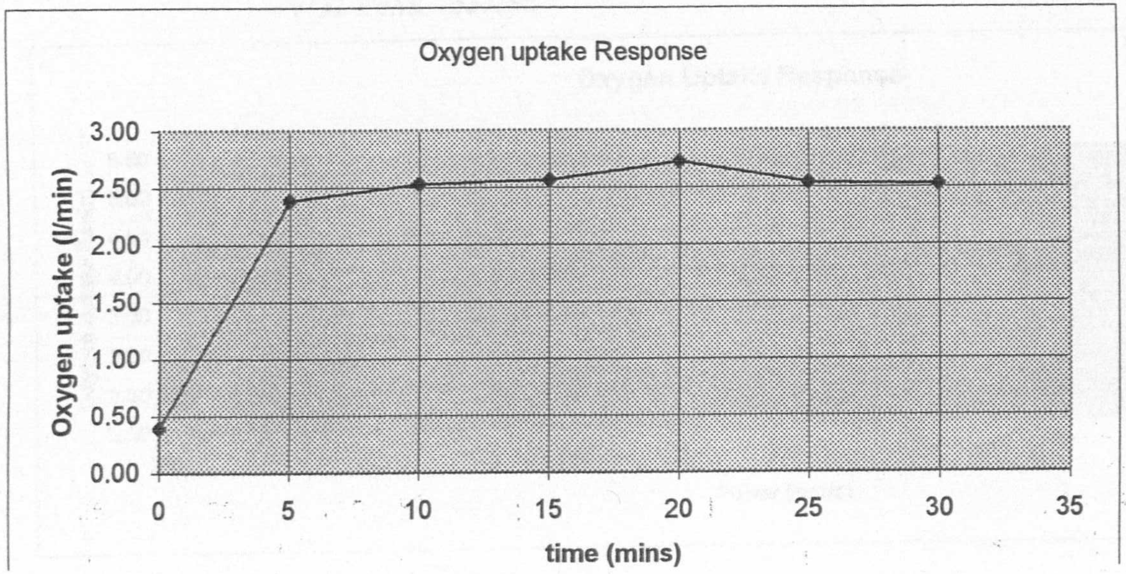
Pressure 752.2
Temp 16.4

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	304.22	55	53.1	16.98	3.56	16.2	1.27		
5	58.55	149	90.2	18.03	3.12	16.4			
10	57.77	159	96.3	18.12	2.92	16.4			
15	58.4	162	93.3	18.00	2.87	16.4			
20	61.22	168	93.7	17.71	3.03	16.4			
25	58.12	161	93.2	18.04	2.82	16.4			
30	58.99	169	90.7	17.93	2.95	16.4	5.1		
35							3.93		

Heart Rate	Time	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
55	0.0	Rest	304.22	53.1	0.6	16.98	3.56	16.2	752.2	0.98	81.4	13.8
149	5.0	1	58.55	90.2	0.6	18.03	3.12	16.4				14.0
159	10.0	2	57.77	96.3	0.6	18.12	2.92	16.4				14.0
162	15.0	3	58.4	93.3	0.6	18	2.87	16.4				14.0
168	20.0	4	61.22	93.7	0.6	17.71	3.03	16.4				14.0
161	25.0	5	58.12	93.2	0.6	18.04	2.82	16.4				14.0
169	30.0	6	58.99	90.7	0.6	17.93	2.95	16.4				14.0

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
11.7	9.5	0.39	0.33	**0.863**	**4.8**	24.6	28.5	**55**	
102.3	83.6	2.39	2.57	**1.074**	**29.3**	35.0	32.6	**149**	
110.6	90.4	2.53	2.59	**1.026**	**31.1**	35.8	34.8	**159**	
106.0	86.6	2.57	2.44	**0.952**	**31.5**	33.8	35.5	**162**	
101.6	83.0	2.73	2.47	**0.907**	**33.5**	30.4	33.6	**168**	
106.4	87.0	2.54	2.41	**0.947**	**31.2**	34.2	36.1	**161**	
102.1	83.4	2.53	2.42	**0.957**	**31.0**	33.0	34.5	**169**	**5.1**
									3.93

Subject 1
Sailing simulation
13.11.97
81.4 kg

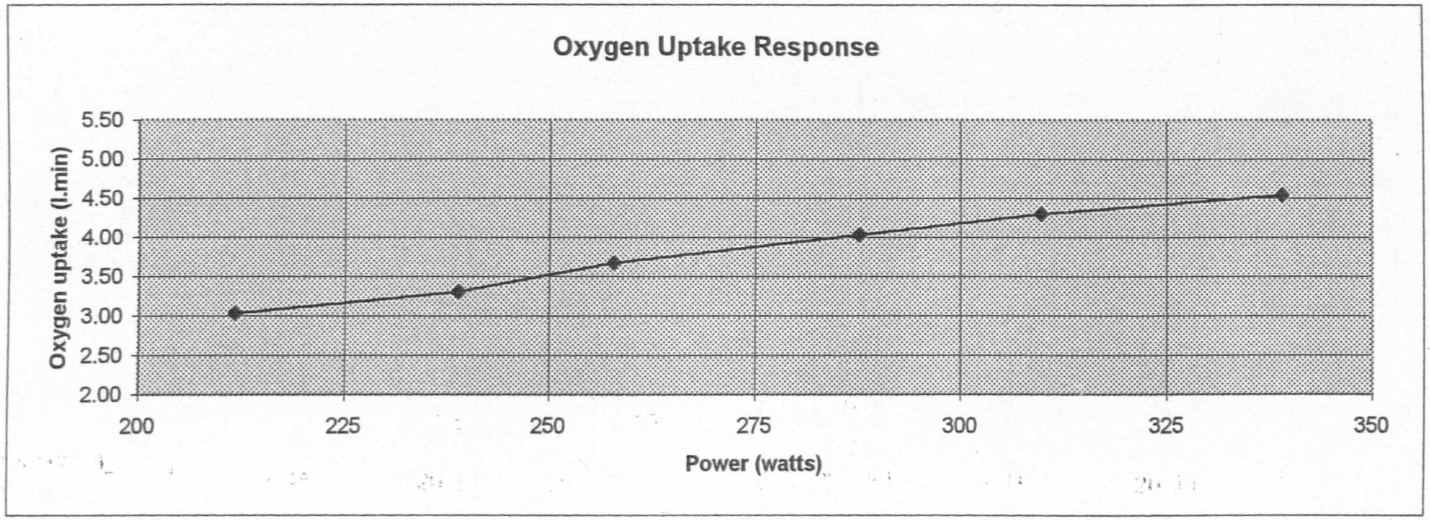


Heart Rate	workrate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
129	202.1	1	58.88	89.1	0.6	17.43	3.82	18.1	761.5	0.98	81.4	15.5
139	220.6	2	61.29	97.6	0.6	17.22	4	18.1				15.5
147	236.7	3	60.12	108.8	0.6	17.47	3.81	18				15.5
159	257.5	4	60.33	125.6	0.6	17.65	3.62	18				15.5
164	281.8	5	59.1	146.3	0.6	17.86	3.46	18				15.5
173	311.6	6	60.01	171.5	0.6	18.06	3.26	18				15.5

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	% VO2 peak
99.6	82.5	2.83	3.11	1.099	34.8	29.1	26.5	129	65.5
104.8	86.7	3.16	3.43	1.083	38.9	27.4	25.3	139	73.2
119.0	98.5	3.33	3.71	1.111	41.0	29.6	26.6	147	77.2
136.8	113.3	3.63	4.04	1.114	44.6	31.2	28.0	159	84.0
162.6	134.6	4.01	4.59	1.143	49.3	33.5	29.3	164	92.9
187.6	155.3	4.32	4.99	1.154	53.1	35.9	31.2	173	100.0

Subject 1
Cycling VO2 max test
10.3.98
81.4 kg

VO2 Peak 53.085



Chapter 6: Dynamic simulation of dinghy sailing.

Subject 2.

Name: Sub 2
Date 16/3/98
Height 1.84
Weight 81.3 kg

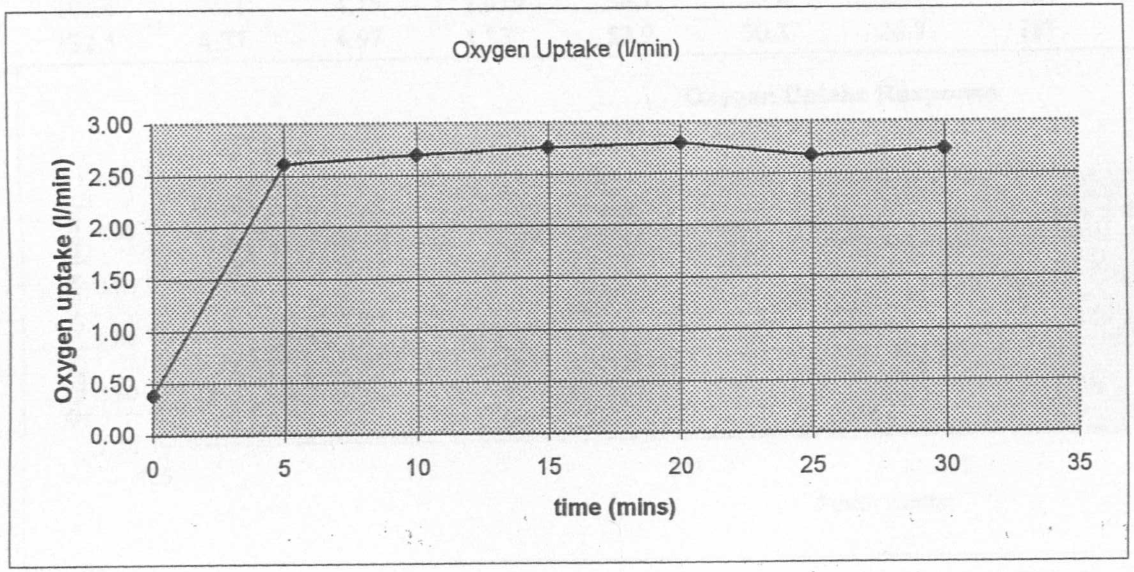
Pressure 772.0
Temp 18.0°C

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	308.71	64	566	17.26	3.24	17.9	0.87		
5	57.88	154	78.3	17.38	3.84	18.0			
10	56.69	157	75.1	17.25	3.76	18.0			
15	59.01	158	81.2	17.29	3.75	18.0			
20	60.21	155	79.1	17.10	3.83	18.0			
25	58.98	149	78.2	17.31	3.60	18.0			
30	59.20	166	82.1	17.37	3.59	18.0	4.44		
35							3.36		

Heart Rate	Time	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
64	0.0	Rest	308.71	56.6	0.6	17.26	3.24	17.9	772	0.98	81.3	15.4
154	5.0	1	57.88	78.3	0.6	17.38	3.84	18				15.5
157	10.0	2	56.69	75.1	0.6	17.25	3.76	18				15.5
158	15.0	3	59.01	81.2	0.6	17.29	3.75	18				15.5
155	20.0	4	60.21	79.1	0.6	17.1	3.83	18				15.5
149	25.0	5	58.98	78.2	0.6	17.31	3.6	18				15.5
166	30.0	6	59.2	82.1	0.6	17.37	3.59	18				15.5

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
12.1	10.2	0.39	0.32	0.840	4.8	26.3	31.3	64	
89.1	74.9	2.61	2.84	1.086	32.1	28.7	26.4	154	
87.3	73.3	2.69	2.72	1.010	33.1	27.2	27.0	157	
90.6	76.1	2.76	2.82	1.020	34.0	27.6	27.0	158	
86.5	72.7	2.80	2.75	0.983	34.4	26.0	26.5	155	
87.3	73.4	2.67	2.60	0.975	32.9	27.5	28.2	149	
91.3	76.7	2.74	2.72	0.992	33.7	28.0	28.2	166	4.44
									3.36

Subject 2
Sailing simulation
9.3.98
81.3 kg



Heart Rate	workrate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
146	150.2	1	59.57	55.3	0.6	16.32	4.32	20	747	0.98	81	17.5
157	185.2	2	60.29	72.6	0.6	16.48	4.26	20	747	0.98	81	17.5
166	221.5	3	58.07	86.9	0.6	16.6	4.27	20	747	0.98	81	17.5
172	252.5	4	59.37	105.8	0.6	16.9	4.06	20	747	0.98	81	17.5
174	278.8	5	37.59	68.8	0.6	16.9	3.89	20	747	0.98	81	17.5
181	309.2	5	39.48	80.8	0.6	17.13	3.91	20	747	0.98	81	17.5
187	345.2	7	41.03	102.8	0.6	17.54	3.8	20	747	0.98	81	17.5

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	% VO2 peak
60.9	49.4	2.32	2.11	**0.908**	**28.7**	21.3	23.4	146	**53.1**
78.7	63.9	2.88	2.69	**0.932**	**35.6**	22.1	23.8	157	**66.0**
97.7	79.2	3.46	3.34	**0.968**	**42.7**	22.9	23.7	166	**79.1**
116.2	94.3	3.81	3.78	**0.993**	**47.0**	24.8	24.9	172	**87.1**
119.7	97.1	3.96	3.73	**0.941**	**48.9**	24.5	26.0	174	**90.7**
133.7	108.4	4.11	4.19	**1.019**	**50.7**	26.4	25.9	181	**94.0**
163.4	132.5	4.37	4.97	**1.137**	**53.9**	30.3	26.7	187	**100.0**

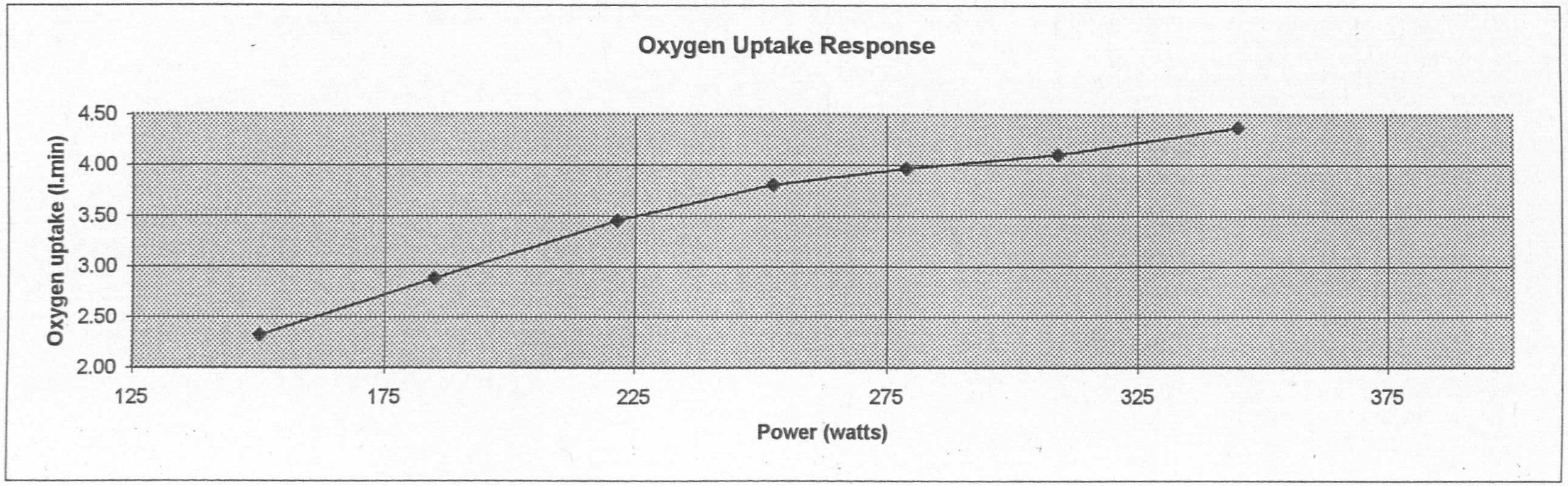
Subject 2

Cycling VO2 max test

16.3.98

81.0 kg

VO2 Peak 53.9



Chapter 6: Dynamic simulation of dinghy sailing.

Subject 3.

[DAIKING JIM]

Name: SUB 3
Date 13.3
Height 77.5 kg
Weight 1.775 m

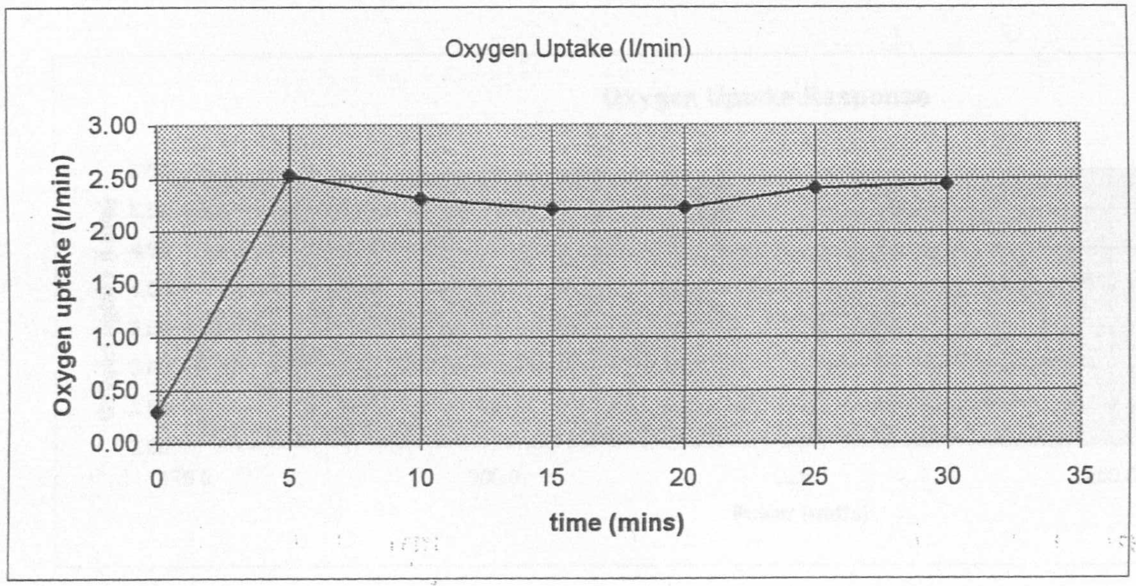
Pressure 751.0
Temp 17½

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	304.88	56	47.3	17.44	3.3	17.2	1.12		
5	61.29	165	82.0	17.37	3.81	17.4			
10	58.98	163	74.8	17.56	3.40	17.4			
15	57.11	159	73.4	17.75	3.21	17.4			
20	56.9	164	70.0	17.63	3.19	17.4			
25	58.08	168	72.8	17.41	3.42	17.4			
30	59.34	165	76.3	17.46	3.32	17.4	5.94		
35							4.58		

Heart Rate	Time	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
56	0.0	Rest	304.88	47.3	0.6	17.44	3.3	17.2	751	0.98	77.5	14.7
165	5.0	1	61.29	82	0.6	17.37	3.81	17.4				14.9
163	10.0	2	58.98	74.8	0.6	17.56	3.4	17.4				14.9
159	15.0	3	57.11	73.4	0.6	17.75	3.21	17.4				14.9
164	20.0	4	56.9	70	0.6	17.63	3.19	17.4				14.9
168	25.0	5	58.08	72.8	0.6	17.41	3.42	17.4				14.9
165	30.0	6	59.34	76.3	0.6	17.46	3.32	17.4				14.9

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
10.3	8.4	0.30	0.27	**0.914**	**3.9**	28.1	30.8	**56**	
88.5	72.2	2.53	2.71	**1.071**	**32.7**	28.5	26.6	**165**	
83.9	68.5	2.31	2.29	**0.992**	**29.8**	29.6	29.9	**163**	
85.1	69.4	2.21	2.19	**0.991**	**28.5**	31.4	31.6	**159**	
81.4	66.4	2.22	2.09	**0.939**	**28.7**	29.9	31.8	**164**	
83.0	67.7	2.41	2.28	**0.946**	**31.1**	28.1	29.7	**168**	
85.1	69.4	2.45	2.27	**0.928**	**31.6**	28.4	30.6	**165**	**5.94**
									4.58

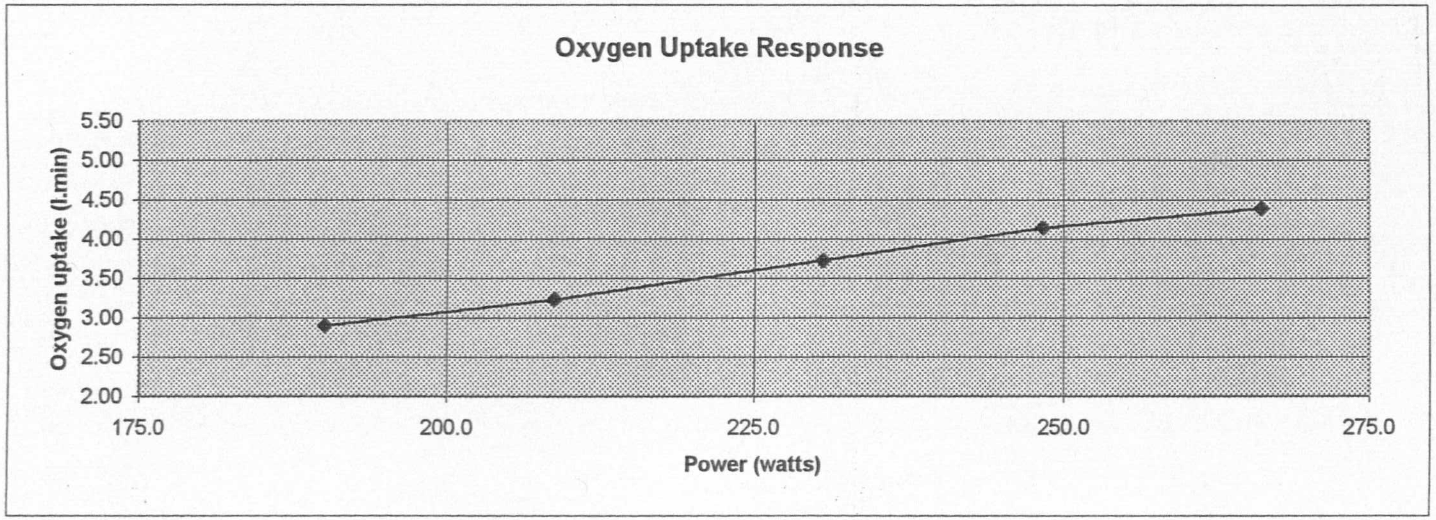
Subject 3
Sailing simulation
13.3.98
77.5 kg



Heart Rate	workrate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
145	190.1	1	59.01	64.4	0.6	16.04	5.04	18.1	761.5	0.98	77.5	15.5
155	208.8	2	57.66	71.8	0.6	16.14	4.96	18.1				15.5
167	230.6	3	59.12	91.9	0.6	16.47	4.74	18.2				15.6
174	248.3	4	58.22	121	0.6	17.17	4.17	18.2				15.6
185	266.2	5	58.9	151.8	0.6	17.68	3.73	18.2				15.6

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	% VO2 peak
72.0	59.6	2.90	2.98	**1.026**	**37.4**	20.6	20.0	**145**	**66.0**
82.1	68.0	3.24	3.34	**1.031**	**41.8**	21.0	20.4	**155**	**73.7**
102.3	84.7	3.73	3.97	**1.066**	**48.1**	22.7	21.3	**167**	**84.8**
136.5	113.0	4.14	4.66	**1.124**	**53.5**	27.3	24.3	**174**	**94.3**
169.1	140.0	4.39	5.15	**1.173**	**56.7**	31.9	27.2	**185**	**100.0**

Subject 3
Cycling VO2 max test
10.3.98
77.5 kg



Chapter 6: Dynamic simulation of dinghy sailing.

Subject 4.

30 MIN SAILING SIM

SUB 4

Name:
Date 2.3.98
Height 1.82
Weight 80.8 kg

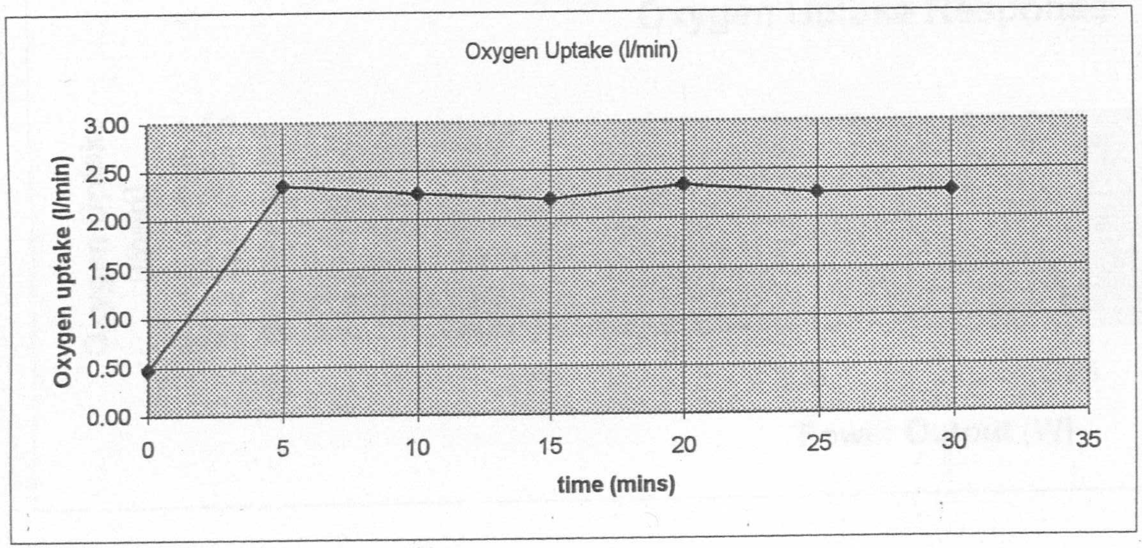
Pressure 758.0
Temp 18°C

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	315.18	61	53.3	15.93	4.61	18.2	0.90		
5	57.3	138	70.4	17.36	3.78	18.3			
10	58.47	147	67.0	17.31	3.61	18.3			
15	59.44	152	71.0	17.53	3.45	18.3			
20	57.87	158	77.0	17.68	3.33	18.3			
25	56.98	153	74.7	17.74	3.30	18.3			
30	59.12	165	76.0	17.65	3.38	18.3	3.51		
35							3.04		

Heart Rate	Time	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
61	0.0	Rest	315.18	53.3	0.6	15.93	4.61	18.2	758	0.98	80.8	15.6
138	5.0	1	57.3	70.4	0.6	17.36	3.78	18.3				15.7
147	10.0	2	58.47	67	0.6	17.31	3.61	18.3				15.7
152	15.0	3	59.44	71	0.6	17.53	3.45	18.3				15.7
158	20.0	4	57.87	77	0.6	17.68	3.33	18.3				15.7
153	25.0	5	56.98	74.7	0.6	17.74	3.3	18.3				15.7
165	30.0	6	59.12	76	0.6	17.65	3.38	18.3				15.7

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
11.2	9.2	0.47	0.42	**0.891**	**5.8**	19.5	21.9	**61**	
81.0	66.7	2.35	2.49	**1.057**	**29.1**	28.3	26.8	**138**	
75.5	62.2	2.26	2.22	**0.978**	**28.0**	27.5	28.1	**147**	
78.7	64.8	2.21	2.20	**0.999**	**27.3**	29.4	29.4	**152**	
87.6	72.2	2.34	2.37	**1.011**	**29.0**	30.8	30.5	**158**	
86.3	71.1	2.26	2.31	**1.023**	**28.0**	31.5	30.8	**153**	
84.7	69.7	2.28	2.32	**1.019**	**28.2**	30.6	30.0	**165**	**3.51**
									3.04

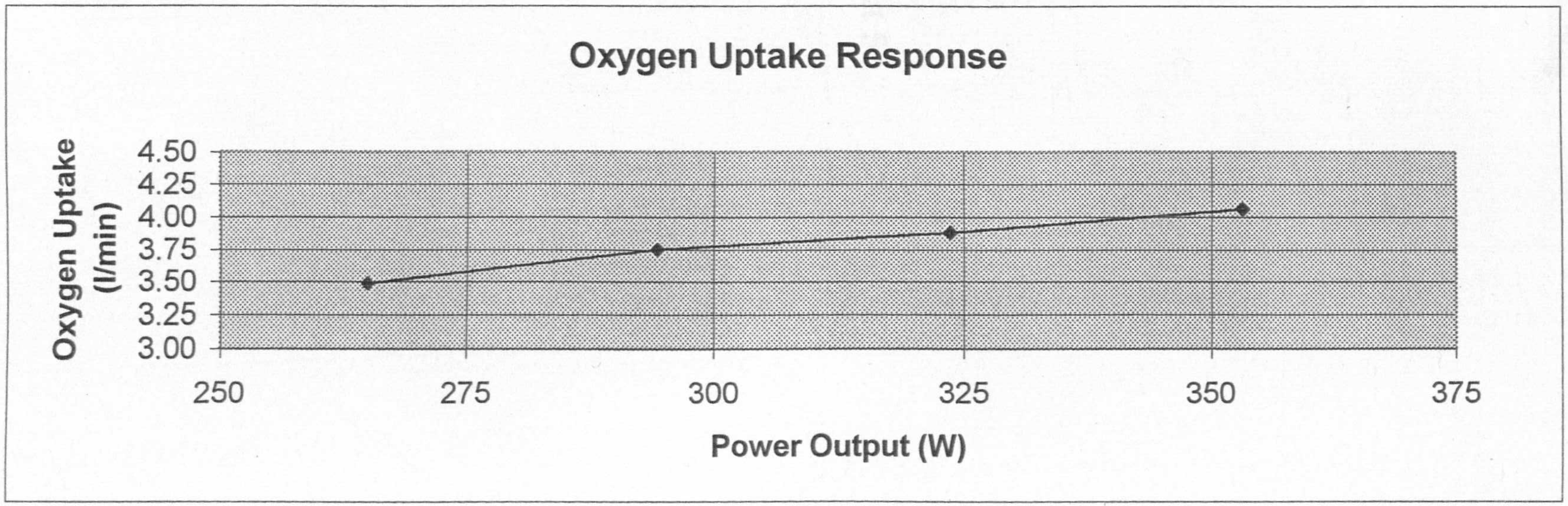
Subject 4
Sailing simulation
9.3.98
80.8 kg



H.R.	workrate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
182	264.9	1	41.23	56.9	0.6	16.22	4.91	22.3	768.5	0.98	81	20.2
185	294.3	2	38.9	64.2	0.6	16.65	4.62	22.3	768.5	0.98	81	20.2
189	323.7	3	34.3	68.5	0.6	17.2	4.28	22.3	768.5	0.98	81	20.2
194	353.2	4	34.76	88	0.6	17.8	3.78	22.3	768.5	0.98	81	20.2

Subject 4
Cycling VO2 max test
2.3.98
81

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	%VO2 peak	H.R.
89.3	74.7	3.49	3.63	**1.040**	**43.1**	21.4	20.6	**86.0**	113
106.7	89.2	3.75	4.08	**1.087**	**46.3**	23.8	21.9	**92.4**	124
129.0	107.8	3.88	4.56	**1.175**	**47.9**	27.8	23.6	**95.7**	135
163.2	136.4	4.06	5.09	**1.254**	**50.1**	33.6	26.8	**100.0**	156



Chapter 6: Dynamic simulation of dinghy sailing.

Subject 5.

Name: Sub 5
Date 13/11/97
Height 1·79
Weight 71·0 kg

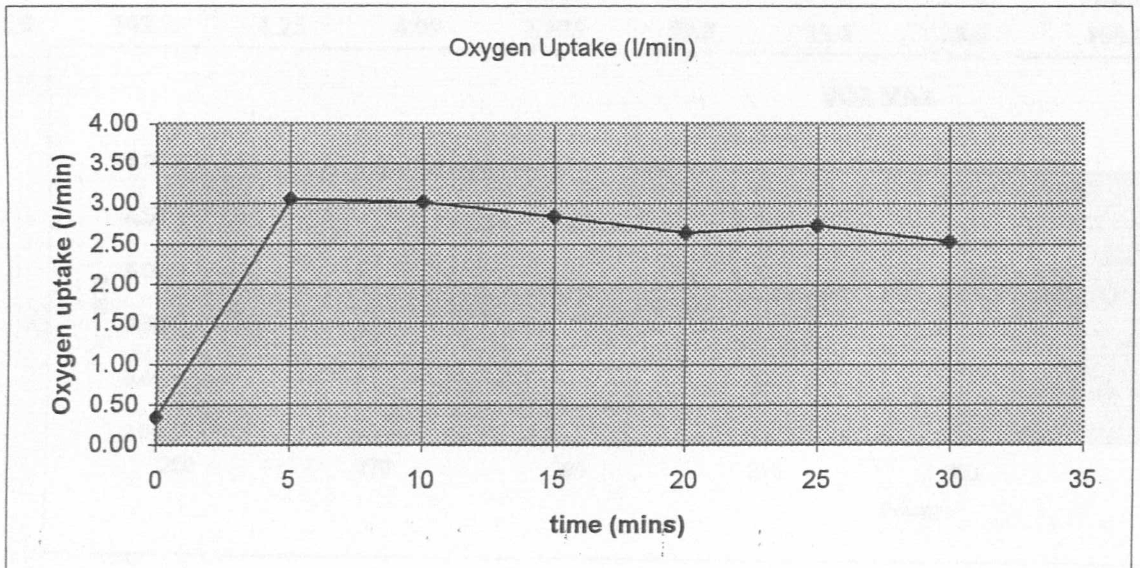
Pressure 752·85
Temp 17·0°C

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	297·52	48	49·2	17·32	2·99	17·2	1·41		
5	59·9	154	106·9	17·70	3·54	17·1			
10	60·22	157	108·1	17·81	3·23	17·1			
15	59·09	156	105·9	18·01	2·95	17·1			
20	59·86	150	94·2	17·88	2·93	17·1			
25	59·5	150	92·7	17·77	2·95	17·1			
30	58·77	147	100·1	18·22	2·63	17·1	4·24		
35							3·01		

Heart Rate	Time	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
48	0.0	Rest	297.52	49.2	0.6	17.32	2.99	17.2	752.85	0.98	71	14.7
154	5.0	1	59.9	106.9	0.6	17.7	3.54	17.1				14.6
157	10.0	2	60.22	108.1	0.6	17.81	3.23	17.1				14.6
156	15.0	3	59.09	105.9	0.6	18.01	2.95	17.1				14.6
150	20.0	4	59.86	94.2	0.6	17.88	2.93	17.1				14.6
150	25.0	5	59.5	92.7	0.6	17.77	2.95	17.1				14.6
147	30.0	6	58.77	100.1	0.6	18.22	2.63	17.1				14.6

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
11.0	9.0	0.34	0.26	**0.776**	**4.8**	26.4	34.0	**48**	
118.0	96.5	3.05	3.37	**1.103**	**43.0**	31.6	28.7	**154**	
118.6	97.0	3.01	3.09	**1.024**	**42.5**	32.2	31.4	**157**	
118.5	96.9	2.84	2.81	**0.991**	**40.0**	34.2	34.5	**156**	
104.1	85.1	2.64	2.45	**0.930**	**37.1**	32.3	34.7	**150**	
103.1	84.3	2.72	2.44	**0.897**	**38.4**	30.9	34.5	**150**	
112.6	92.1	2.53	2.38	**0.939**	**35.6**	36.4	38.8	**147**	**4.24**
									3.01

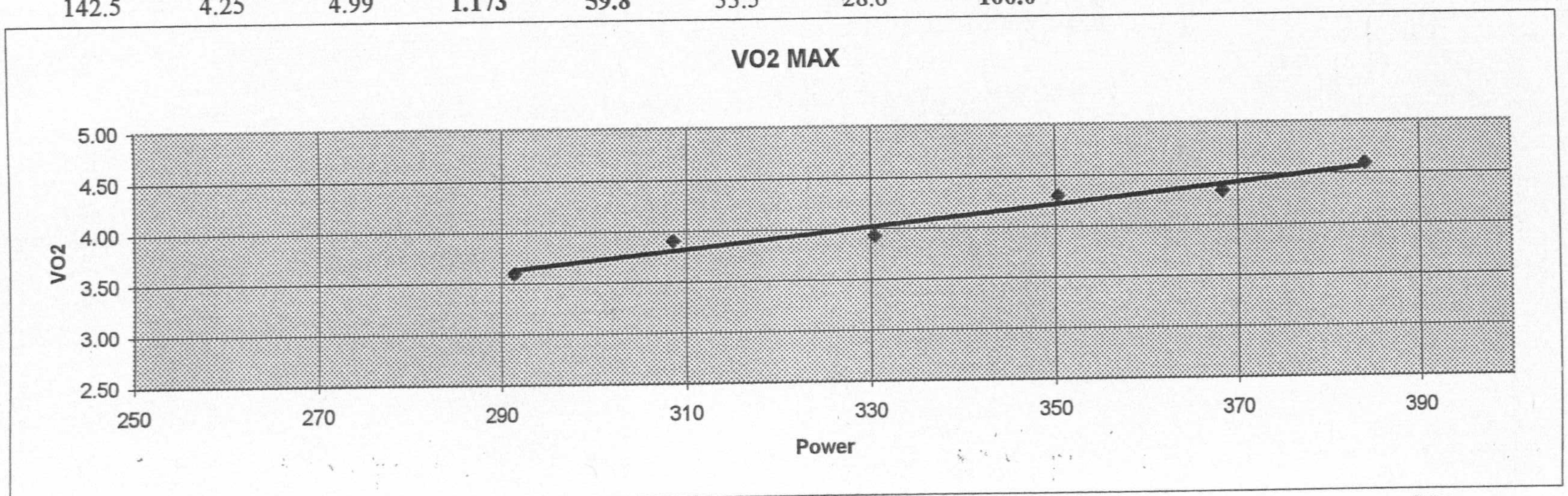
Subject 5
Sailing simulation
13.11.97
71.0 kg



Heart Rate	workrate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
162	301.5	1	43.35	65.8	0.6	16.81	4.31	20.9	762.2	0.98	71.1	18.5
168	318.6	2	44.15	76.9	0.6	16.99	4.25	20.8	762.2	0.98	71.1	18.4
171	336.5	3	45.95	79.4	0.6	16.92	4.31	20.8	762.2	0.98	71.1	18.4
174	354.3	4	45.84	96	0.6	17.26	4.11	20.9	762.2	0.98	71.1	18.5
177	368.3	5	36	85.7	0.6	17.62	3.78	20.9	762.2	0.98	71.1	18.5
182	384	6	40.82	108.2	0.6	17.84	3.55	20.9	762.2	0.98	71.1	18.5

Subject 5
Cycling VO2 max test
20.11.97
71.1 kg

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	%VO2 paek
98.8	81.9	3.35	3.49	**1.043**	**47.0**	24.5	23.5	**78.7**
113.3	93.9	3.64	3.94	**1.084**	**51.1**	25.8	23.8	**85.5**
112.4	93.1	3.67	3.97	**1.080**	**51.7**	25.3	23.5	**86.4**
135.9	112.6	4.02	4.57	**1.138**	**56.5**	28.0	24.6	**94.6**
154.6	128.1	4.10	4.78	**1.165**	**57.7**	31.2	26.8	**96.5**
171.9	142.5	4.25	4.99	**1.173**	**59.8**	33.5	28.6	**100.0**



Chapter 6: Dynamic simulation of dinghy sailing.

Subject 6.

30 MINUTE SAILING SIMULATION

Name: (SUB 6)
Date 14.3.98
Height 1.825
Weight 76.1 kg

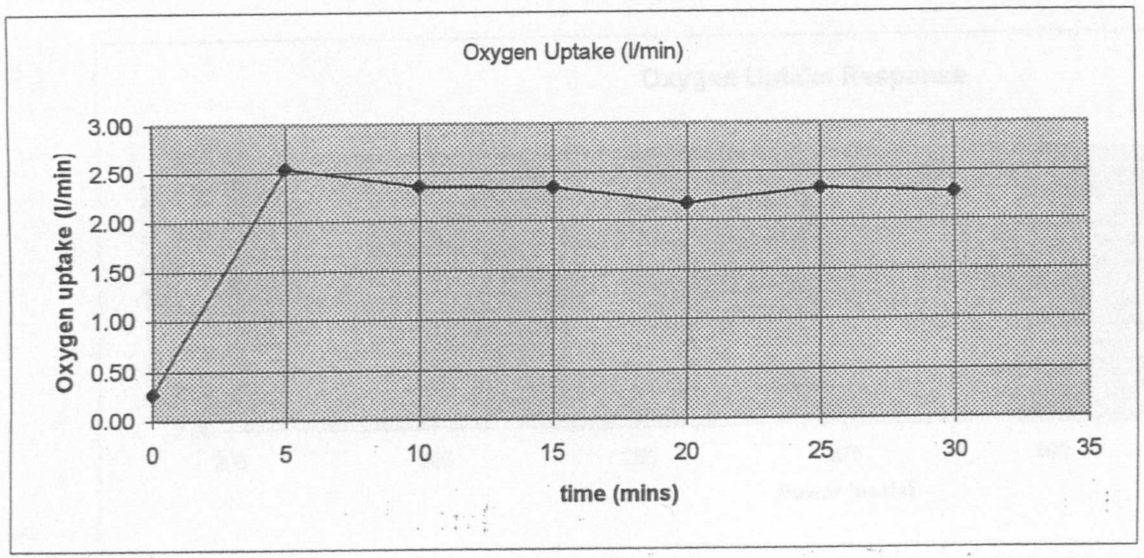
Pressure 19°C
Temp 750.15

Time	Coll	fc	VE	FeO2	FeCO2	Temp	Lac	B.P	RPE
Rest	30.02	52	38.6 ~~[illegible]~~	17.12 ~~[illegible]~~	3.04 ~~[illegible]~~	19.1			
5	60.22	148	81.4	17.32	3.97	19.1			
10	59.9	144	69.7	17.16	3.80	19.1			
15	60.12	147	64.8	16.92	3.90	19.1			
20	59.04	147	56.9	16.81	3.85	19.1			
25	61.00	144	62.5	16.76	3.94	19.1			
30	59.88	148	63.3	16.95	3.86	19.1	3.56		
35							3.33		

Heart Rate	Time	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
52	0.0	Rest	304.02	38.6	0.6	17.12	3.04	19.1	750.15	0.98	76.1	16.6
148	5.0	1	60.22	81.4	0.6	17.32	3.97	19.1				16.6
144	10.0	2	59.9	69.7	0.6	17.16	3.8	19.1				16.6
147	15.0	3	60.12	64.8	0.6	16.92	3.9	19.1				16.6
147	20.0	4	59.04	56.9	0.6	16.81	3.85	19.1				16.6
144	25.0	5	61	62.5	0.6	16.76	3.94	19.1				16.6
148	30.0	6	59.88	63.3	0.6	16.95	3.86	19.1				16.6

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	Lactate
8.4	6.8	0.28	0.20	0.742	3.6	24.8	33.4	52	
88.7	72.2	2.55	2.83	1.110	33.5	28.3	25.5	148	
76.4	62.3	2.35	2.33	0.993	30.9	26.5	26.7	144	
70.8	57.7	2.34	2.22	0.949	30.8	24.7	26.0	147	
63.4	51.7	2.17	1.96	0.903	28.6	23.8	26.3	147	
67.4	54.9	2.33	2.13	0.916	30.6	23.5	25.7	144	
69.5	56.6	2.28	2.16	0.946	30.0	24.8	26.2	148	3.56
									3.33

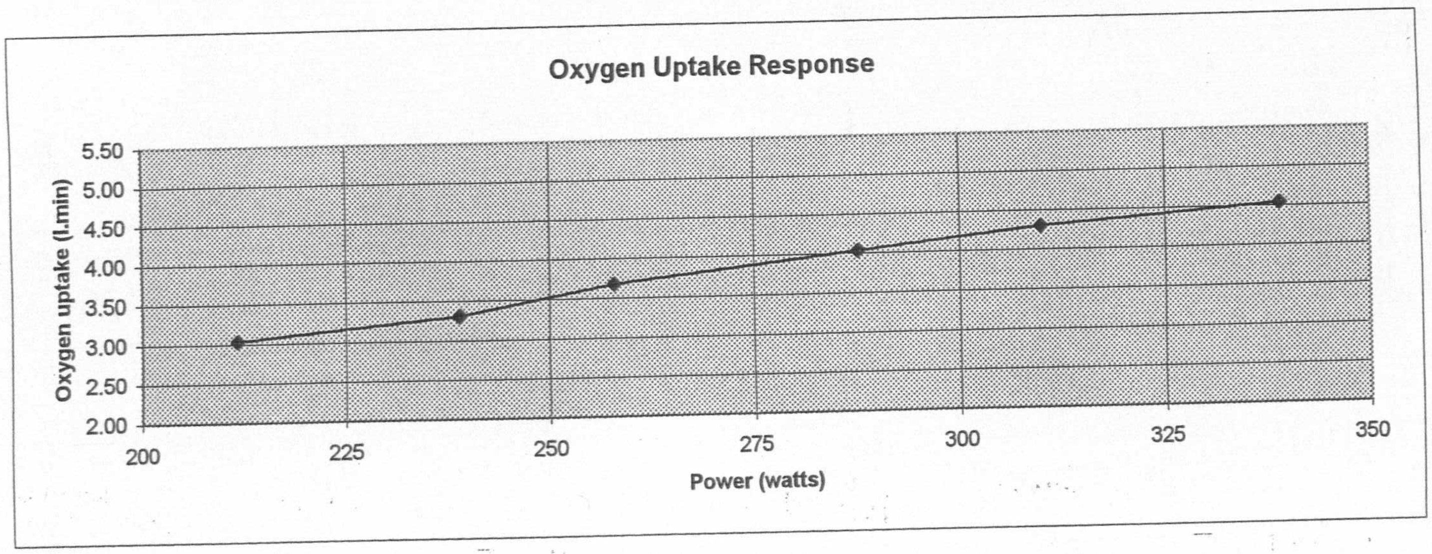
Subject 6
Sailing simulation
14.3.98
76.1 kg



Heart Rate	workrate	coll no.	coll time	meter vol	samp vol	FEO2dry	FECO2-d	temp	pressure	vol factor	subj. mass	SVP
139	211.7	1	59.22	64.4	0.6	15.86	4.96	18.5	761.5	0.98	75.3	15.9
147	239.0	2	58.19	68.6	0.6	15.81	5.09	18.5				15.9
155	257.9	3	59.57	85.1	0.6	16.19	4.83	18.5				15.9
162	287.7	4	60.28	96.4	0.6	16.4	4.19	18.5				15.9
171	309.9	5	59.99	115	0.6	16.71	4.63	18.5				15.9
175	339.2	6	60.12	134.4	0.6	17.08	4.32	18.5				15.9

VE(btps)	VE(stpd)	VO2	VCO2	RER	VO2/Kg	VE/VO2	VE/VCO2	Heart Rate	%VO2 peak
71.6	59.3	3.03	2.91	0.960	40.3	19.6	20.4	139	66.8
77.6	64.3	3.30	3.24	0.980	43.9	19.4	19.8	147	72.8
93.9	77.7	3.68	3.72	1.010	48.8	21.1	20.9	155	81.0
105.0	86.9	4.03	3.60	0.893	53.5	21.6	24.2	162	88.8
125.7	104.1	4.30	4.77	1.110	57.1	24.2	21.8	171	94.7
146.5	121.3	4.54	5.18	1.141	60.3	26.7	23.4	175	100.0

Subject 6
Cycling VO2 max test
10.3.98
75.3 kg



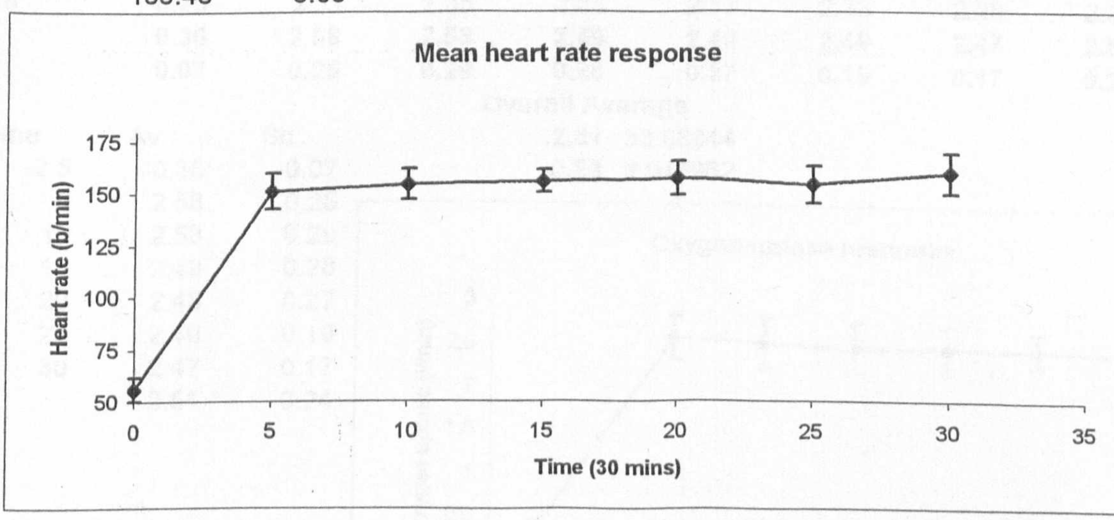
Chapter 6: Dynamic simulation: Statistical analysis

Dynamic simulation - Excel spreadsheet stats

HR	Rest	5 mins	10 mins	15 mins	20 mins	25 mins	30 mins
sub 1	55	149	159	162	168	161	169
sub 2	64	154	157	158	155	149	166
sub 3	56	165	163	159	164	168	165
sub 4	61	138	147	152	158	153	165
sub 5	48	154	157	156	150	150	147
sub 6	52	148	144	147	147	144	148
Av	**56**	**151.3**	**154.5**	**155.7**	**157.0**	**154.2**	**160.0**
SD	**5.8**	**8.9**	**7.4**	**5.4**	**8.0**	**8.8**	**9.8**

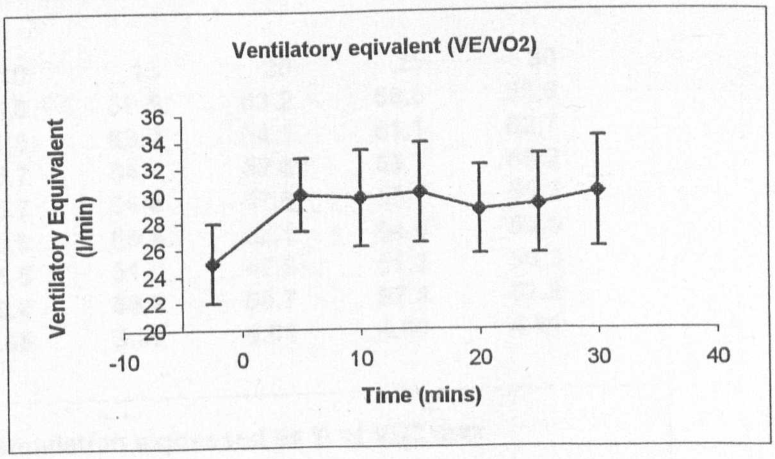
Mean HR

Time	AV	SD	
0	56	5.8	
5	151.3	8.9	155
10	154.5	7.4	159
15	155.7	5.4	160
20	157	8	161
25	154.2	8.8	162
30	160	9.8	165
	155.45	8.05	



VE/VO2	Rest	5 mins	10 mins	15 mins	20 mins	25 mins	30 mins	
sub 1	24.6	35	35.8	33.8	30.4	34.2	33	
sub 2	26.3	28.7	27.2	27.6	26	27.5	28	
sub 3	28.1	28.5	29.6	31.4	29.9	28.1	28.4	
sub 4	19.5	28.3	27.5	29.4	30.8	31.5	30.6	
sub 5	26.4	31.6	32.2	34.2	32.3	30.9	36.4	
sub 6	24.8	28.3	26.5	24.7	23.8	23.5	24.8	
AV	**25.0**	**30.1**	**29.8**	**30.2**	**28.9**	**29.3**	**30.2**	**29.7**
VE/VO2	**3.0**	**2.7**	**3.6**	**3.7**	**3.3**	**3.7**	**4.1**	**3.5**

Time	AV	SD
-2.5	25	3
5	30.1	2.7
10	29.8	3.6
15	30.2	3.7
20	28.9	3.3
25	29.3	3.7
30	30.2	4.1
	29.75	**3.52**



VO2 - simulation

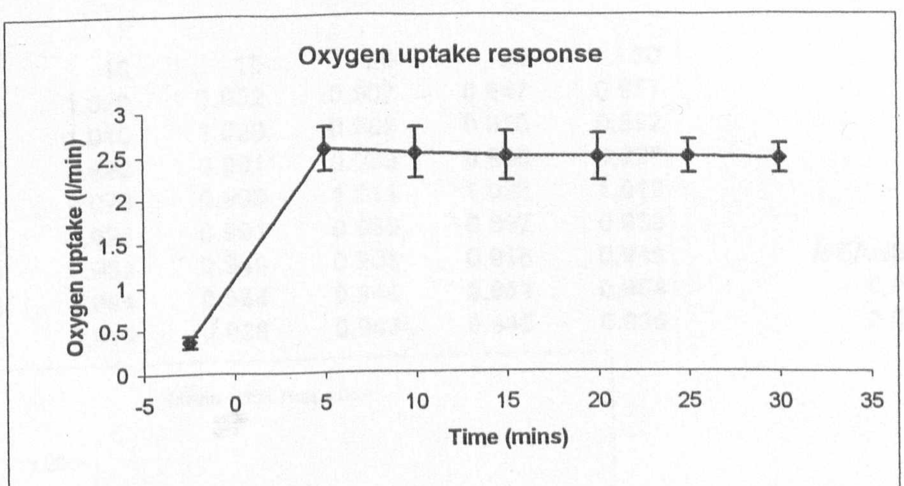
	Rest	5 mins	10 mins	15 mins	20 mins	25 mins	30 mins	AV
sub 1	0.39	2.39	2.53	2.57	2.73	2.54	2.53	2.55
sub 2	0.39	2.61	2.69	2.76	2.8	2.67	2.74	2.71
sub 3	0.3	2.53	2.31	2.21	2.22	2.41	2.45	2.36
sub 4	0.47	2.35	2.26	2.21	2.34	2.26	2.28	2.28
sub 5	0.34	3.05	3.01	2.84	2.64	2.72	2.53	2.80
sub 6	0.28	2.55	2.35	2.34	2.17	2.33	2.28	2.34
AV	**0.36**	**2.58**	**2.53**	**2.49**	**2.48**	**2.49**	**2.47**	**2.51**
SD	**0.07**	**0.25**	**0.29**	**0.28**	**0.27**	**0.19**	**0.17**	**0.21**

Overall Average

2.51 33.06844

0.23 2.947962

Time	Av	Sd
-2.5	0.36	0.07
5	2.58	0.25
10	2.53	0.29
15	2.49	0.28
20	2.48	0.27
25	2.49	0.19
30	2.47	0.17
	2.51	0.24

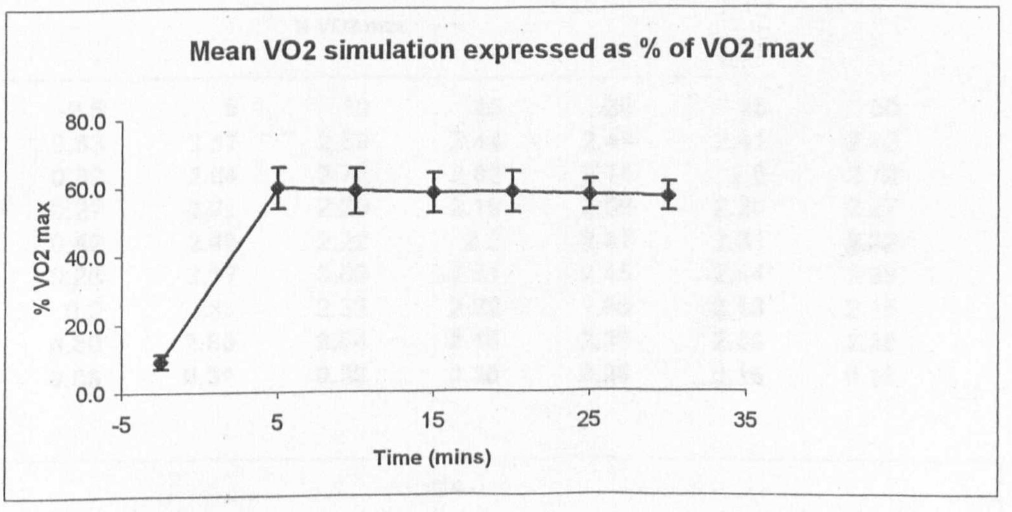


VO2 max		
sub 1	4.32	53.1
sub 2	4.37	53.9
sub 3	4.39	56.7
sub 4	4.06	50.1
sub 5	4.25	59.8
sub 6	4.54	60.3
AV	**4.32**	**55.65**

VO2 max		
sub 1	4.32	53.1
sub 2	4.37	53.9
sub 3	4.39	56.7
sub 4	4.06	50.1
sub 5	4.25	59.8
sub 6	4.54	60.3
SD	**0.16**	**4.01**

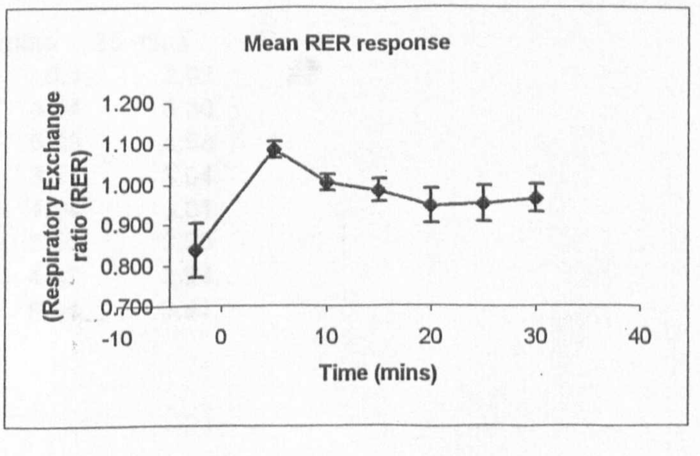
VO2 sim/ VO2 max

	-2.5	5	10	15	20	25	30
sub 1	9.0	55.3	58.6	59.5	63.2	58.8	58.6
sub 2	8.9	59.7	61.6	63.2	64.1	61.1	62.7
sub 3	11.6	57.9	55.7	54.4	57.6	55.7	56.2
sub 4	11.6	57.9	55.7	54.4	57.6	55.7	56.2
sub 5	8.0	71.8	70.8	66.8	62.1	64.0	59.5
sub 6	6.2	56.2	51.8	51.5	47.8	51.3	50.2
Mean	**9.2**	**59.8**	**59.0**	**58.3**	**58.7**	**57.8**	**57.2**
SD	**2.10**	**6.06**	**6.65**	**5.89**	**6.03**	**4.50**	**4.21**

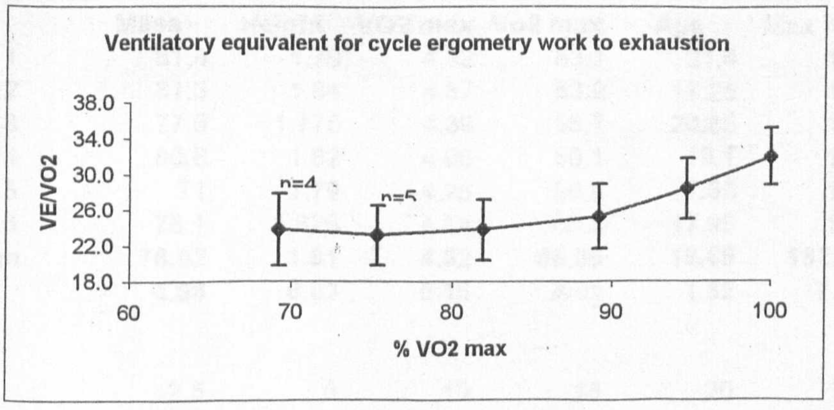


RER

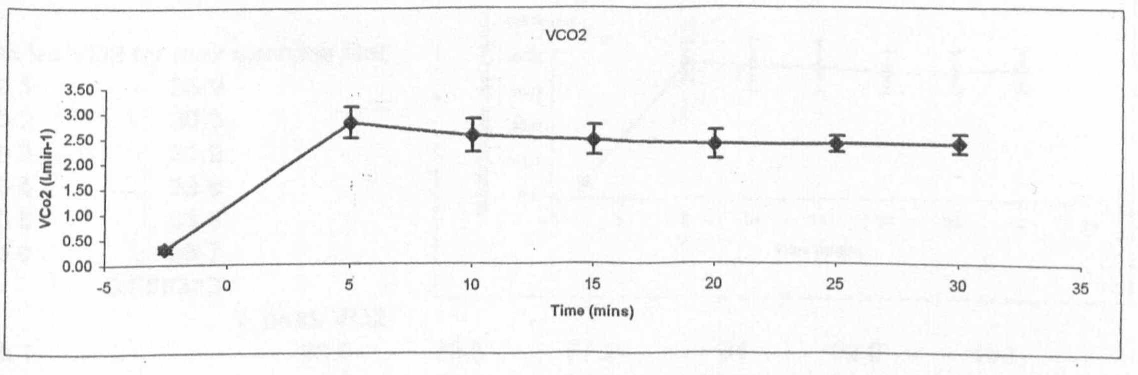
	-2.5	5	10	15	20	25	30	
sub 1	0.863	1.074	1.026	0.952	0.907	0.947	0.957	
sub 2	0.840	1.086	1.010	1.020	0.983	0.975	0.992	
sub 3	0.914	1.071	0.992	0.991	0.939	0.946	0.928	
sub 4	0.891	1.057	0.978	0.999	1.011	1.023	1.019	
sub 5	0.776	1.103	1.024	0.991	0.930	0.897	0.939	
sub 6	0.742	1.110	0.993	0.949	0.903	0.916	0.946	MEANS
Mean	**0.838**	**1.084**	**1.004**	**0.984**	**0.946**	**0.951**	**0.964**	0.988
SD	**0.067**	**0.020**	**0.019**	**0.028**	**0.043**	**0.045**	**0.035**	0.032



23.8	**23.2**	**23.9**	**25.3**	**28.4**	**32.0**
4.0	3.4	3.4	3.6	3.4	3.2



	-2.5	5	10	15	20	25	30
sub 1	0.33	2.57	2.59	2.44	2.47	2.41	2.42
sub 2	0.32	2.84	2.72	2.82	2.75	2.6	2.72
sub 3	0.27	2.71	2.29	2.19	2.09	2.28	2.27
sub 4	0.42	2.49	2.22	2.2	2.37	2.31	2.32
sub 5	0.26	3.37	3.09	2.81	2.45	2.44	2.38
sub 6	0.2	2.83	2.33	2.22	1.96	2.13	2.16
AV	**0.30**	**2.80**	**2.54**	**2.45**	**2.35**	**2.36**	**2.38**
SD	**0.08**	**0.31**	**0.33**	**0.30**	**0.28**	**0.16**	**0.19**



Blood Lactates

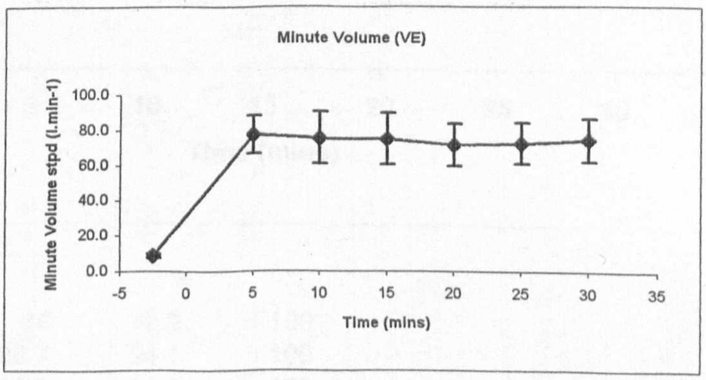
	Rest	30 mins	35 mins
sub 1	1.27	5.1	3.93
sub 2	0.87	4.44	3.36
sub 3	1.12	5.95	4.58
sub 4	0.9	3.51	3.04
sub 5	1.41	4.24	3.01
sub 6	0.88	3.56	3.33
AV	**1.08**	**4.47**	**3.54**
SD	**0.23**	**0.94**	**0.61**

Subject data

	Mass	Height	VO2 max	Vo2 max	Age	Max HR	Mean HR from sim
sub 1	81.4	1.79	4.32	53.1	21.4	173	
sub 2	81.3	1.84	4.37	53.9	17.25	187	
sub 3	77.5	1.775	4.39	56.7	20.65	185	
sub 4	80.8	1.82	4.06	50.1	19.1	194	
sub 5	71	1.79	4.25	59.8	21.55	182	
sub 6	76.1	1.825	4.54	60.3	17.95	175	
Mean	**78.02**	**1.81**	**4.32**	**55.65**	**19.65**	**182.67**	
SD	**4.08**	**0.03**	**0.16**	**4.01**	**1.82**	**7.81**	

VE

	-2.5	5	10	15	20	25	30
sub 1	9.5	83.6	90.4	86.6	83	87	83.4
sub 2	10.2	74.9	73.3	76.1	72.7	73.4	76.7
sub 3	8.4	72.2	68.5	69.4	66.4	67.7	69.4
sub 4	9.2	66.7	62.2	64.8	72.2	71.1	69.7
sub 5	9	96.5	97	96.9	85.1	84.3	92.1
sub 6	6.8	72.2	62.3	57.7	51.7	54.9	56.6
AV	**8.9**	**77.7**	**75.6**	**75.3**	**71.9**	**73.1**	**74.7**
SD	**1.2**	**10.7**	**14.8**	**14.5**	**12.1**	**11.7**	**12.4**



Max Ve/VO2 for max exercise test

sub 1	35.9
sub 2	30.3
sub 3	31.9
sub 4	33.6
sub 5	33.5
sub 6	26.7
	31.98333

% peak VO2

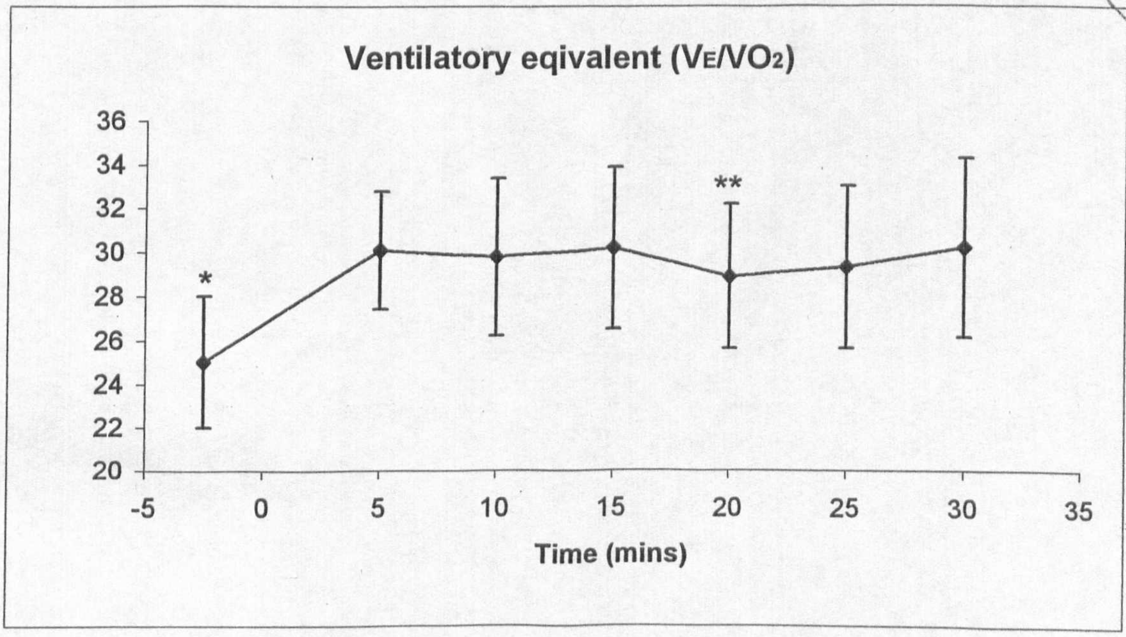
Sub 1	65.5	73.3	77.2	84	92.9	100
Sub 2	66	79.2	87.2	90.7	94.1	100
sub 3		66	73.7	84.8	94.3	100
Sub 4			86	92.4	95.6	100
sub 5	78.6	85.4	86.5	94.5	96.5	100
Sub 6	66.8	72.8	80.9	88.7	94.7	100
	69.225	**75.34**	**81.91667**	**89.18333**	**94.68333**	**100**

Ve/VO2

29.1	27.4	29.6	31.2	33.5	35.9
22.1	22.9	24.8	24.5	26.4	30.3
	20.6	21	22.7	27.3	31.9
		21.4	23.8	27.8	33.6
24.5	25.8	25.3	28	31.2	33.5
19.6	19.4	21.1	21.6	24.2	26.7

VE/VO2 for simulation

	Rest	5 mins	10 mins	15 mins	20 mins	25 mins	30 mins	Mean
sub 1	24.6	35	35.8	33.8	30.4	34.2	33	
sub 2	26.3	28.7	27.2	27.6	26	27.5	28	
sub 3	28.1	28.5	29.6	31.4	29.9	28.1	28.4	
sub 4	19.5	28.3	27.5	29.4	30.8	31.5	30.6	
sub 5	26.4	31.6	32.2	34.2	32.3	30.9	36.4	
sub 6	24.8	28.3	26.5	24.7	23.8	23.5	24.8	
AV	**25.0**	**30.1**	**29.8**	**30.2**	**28.9**	**29.3**	**30.2**	**29.7** = 58%ΔVO
SD	**3.0**	**2.7**	**3.6**	**3.7**	**3.3**	**3.7**	**4.1**	**3.5**



% VO2 peak

65.5	73.3	77.2	84	92.9	100
66	79.2	87.2	90.7	94.1	100
	66	73.7	84.8	94.3	100
		86	92.4	95.6	100
78.6	85.4	86.5	94.5	96.5	100
66.8	72.8	80.9	88.7	94.7	100
69.2	**75.3**	**81.9**	**89.2**	**94.7**	**100.0**

95% VO_2 peak 28.4

Ve/Vo2 from max test

29.1	27.4	29.6	31.2	33.5	35.9
22.1	22.9	24.8	24.5	26.4	30.3
	20.6	21	22.7	27.3	31.9
		21.4	23.8	27.8	33.6
24.5	25.8	25.3	28	31.2	33.5
19.6	19.4	21.1	21.6	24.2	26.7
23.8	**23.2**	**23.9**	**25.3**	**28.4**	**32.0**
4.0	3.4	3.4	3.6	3.4	3.2