7th European Veterans Athletic Non-Stadia Championships

Malta 28/29 April 2001

Course Measurement Report

For the 2500 m Lap used for the 20 Km Women's Walk & the 30 Km Men's Walk

By Michael Sandford
IAAF Grade A Measurer

Measured 26 July 2000

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I was collected from my hotel at 1400 by the Course Manager, Edwin Attard.

For this measurement I used my Michelin World Tour tyre (27 inch x 32 mm dia). I know the measurement characteristics of this tyre very well. At 1430 the pre-measurement calibration was done on the 293.244 m course I had laid down at Qawra, St Paul's Bay for the road races (for details of the calibration course layout see my report on the road race measurement). The average temperature in the shade was 91F.

The Walk Course is located on flat roads and in the quay side car park in Ta' Xbiex. The texture of the road surface was, in common with many Maltese roads, quite smooth like that of the calibration course. Although there were occasional cracks and other defects these would not have been sufficient to affect the calibration constant.

The Walk Course was to be made exactly 2500 m by adjusting the turning points. The general location of these was known, but they needed marking once the approximate course length had been checked. There was plenty of freedom for these to be adjusted to get the length right. Also the radius of the turning semi-circles and the exact location of barriers had to be agreed.

The measurement round the long bend of Ix Xatt was straight forward in one direction. The bicycle was ridden 30 cm from the well defined kerb at the edge of the road. Competitors must remain on the road and not step up onto the footpath, since by doing so they would travel less than the measured distance. The measurement round the long bend in the opposite direction was difficult to define, since there was no centre line marked in the road on which to locate the barriers separating competitors travelling in opposite directions. Therefore I decided to use the measurement obtained when riding on the inside of the bend, next to the kerb, and apply a correction to allow for the larger radius when returning, outside the barrier. Since the road was about 9 m wide it was decided to locate the barriers with their outer edge exactly 400 cm from the inside kerb between the footpath and the road. The location of the barrier should be checked on the day of the race at about 20 points around the long bend to ensure that it is nowhere less than 400 cm. This is important since if the barrier was, for example, only 370 cm from the inner kerb, the course length would be reduced by nearly 1 m per lap.

In the same way, the exact location of the barriers at all the turning points will be critical and must be checked on the race day. PK nails were driven into the road to locate the centres of the turning arcs. Additionally at some locations (see sketch map) PK nails were also used to mark the outer edge of the semi-circular arc of barriers which will be needed to fix the turns accurately. The barriers at each turning point should be measured from the centre point with about 10 cm accuracy using a measuring tape. If

all the barriers were to be accidentally placed 10 cm too close to the centre points then the course would be shortened by about 1 m.

The turn outside 55 Ta' Xbiex was used to make the final (post measurement calculation) adjustment. No nail was inserted here at the time of the measurement but the road surface was marked with green paint in line with the provisional location of the turning point centre, (also exactly in line with the inner edge of the western gate post of house no. 54, named Gloria). When I returned to the course on 28 July, I did not have the hammer and nails to mark the adjusted turning centre, which I had by then calculated should be 750 cm beyond the green paint. It will have to be located accurately in the centre of the road, 90 cm beyond the hexagonal lampost base which is located in the footpath at the place being pointed by my wife in this photograph:

The following procedure may be used to check that the centre of the turning circle, CTC, has been accurately located relative to the reference point shown in the above photograph. Since the road is 9.5 m wide here, CTC should be located approximately 4.75 m from the road side kerb. Measuring with a tape from CTC, make two marks, M1 & M2, at the kerb edge exactly 7 m from CTC. M1 be will near the gatepost in the picture above, and M2 will be to the right of the picture. Now measure the distance between M1 and M2. Divide by two and mark the centre, C. C will be exactly on the perpendicular line from the kerb to CTC. Check that C is exactly 0.9 m to the west of the western edge of the hexagonal metal lampost base, which is being pointed out in the

photo. It is recommended that this procedure be carried out as soon as possible, and a nail placed in the road to permanently mark CTC. I left a box of PK nails with Edwin which may be used for this purpose.

At the other end of the course there are two turning circles, one in the road and one in the quay side car park. They were marked with PK nails. The PK nails are located in a line from the corroded rectangular manhole cover at the quay edge, along the yellow line marking a parking bay. This line passes approximately 1 m east of lampost no 20, which is itself about 10 m west of a telephone box.

The turn into the quay side car park and also the turn-out have been marked with green paint and PK nails. Both use a common centre to the turning arcs provided by a PK nail at the kerb edge as shown in the sketch map. The radius of the arcs marking the outer edge of the barriers should be 360 cm for the turn-in (in line with the yellow edge of the parking bays) and 1060 cm for the turn-out (in line with the white centre line down the quay side). Four further PK nails have been located to mark the ends of these arcs.

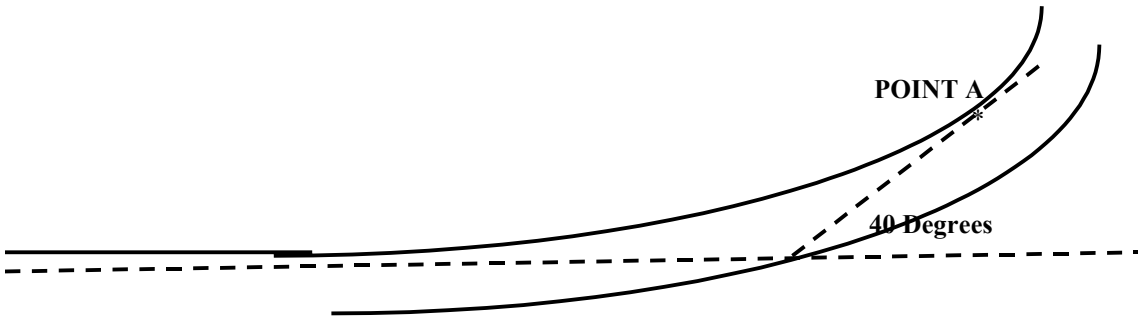
On the way out of the quay side car park, competitors must divert round the kerb by the Customs House. A barrier must be placed on the footpath to prevent anyone taking a short cut.

For the accurate measurement I rode over the shortest possible route, taking a line 30 cm from all barriers including the turn-in arcs to the quayside, which we had painted on the road. I did not measure round the 3 semi-circle turns, but rode to their centre points then turned the bicycle. The additional adjustments for two 3m turning radii and one 4 m turning radius are included in the course length calculation.

I rode the course clockwise, in the reverse direction to that in which competitors will walk. I started at point ‘A’, which was located 4.3 m from the inner kerb, where the competitors on the exit from the quayside would reach the centre barrier if travelling on the shortest possible route. I the rode round the 4 m turn on the quay side and the 3 m turn in the road, and returned to a point on the inner kerb which I had marked exactly opposite point ‘A’. Here I recorded the bicycle counts and then measured to the provisional turn round outside the house called Gloria (next to Ebe, no. 55) which we marked with green paint in line with the inner side of the west gate post. Here I took the final count.

In the calculation I had to add an amount which I would have obtained if I had then rode back to point A on the outside of the barriers, which of course were not in place. The amount to be added consists of two parts. The first is just the distance as measured keeping 0.3 m the inner kerb from point A to the provisional turn. The second part is a correction for the fact that the actual route would be longer when measuring 4.3 m from the inner kerb on the outside the barriers once they are in position. The calculation of this correction uses the angle of the turn. The angle was determined as follows. From the map it was seen that the total angle for the long turn is exactly 180 degrees. However, point A is part way round the long bend. The angle must thus be reduced to

allow for this. The reduction was estimated to be 40 degrees, by standing near the Customs House in a line with the edge of the road and where I could see point A, as shown in the following sketch:



The extra length 4.3 m from the inner kerb is calculated as follows: 4m x pi x (180 – 40)/180. Here 4 m is the extra radius on the long bend due to being 4.3 m from the inner kerb rather than 0.3 m which was where I measured. (180 – 40) degrees is the angle of the bend as estimated by the method above.

The estimate will certainly be accurate to within 15 degrees. If in error by 15 degrees, the error in the length will be 1 m. Such a maximum error is acceptable since the Short Course Prevention Factor, SCPF, included in the calculation of the calibration constant amounts to 2.5 m over a 2500 m course. Normally the SCPF is needed to cover errors in bicycle riding or calibration constant due temperature changes or surface texture variations. However, for this measurement conditions were very good, and I am confident that such normal errors have been kept to less than 0.5 m. Indeed the second precision ride of the course gave a distance differing by just 18 cm, a repeatability typical of good conditions on a course that can be accurately ridden.

After completing the second precision ride at 1820 we traveled back to the calibration course and recalibrated at 1845. The average recalibration temperature was 86.1 F within 0.6 F of that observed during the two precision rides within the previous hour. This post calibration was used as the Constant of the Day for the final calculation of the adjustment needed to the course length.

On the basis of the measurements reported in the following table, I certify that the distance for one lap of the course described here is not less than 2500 m according to the IAAF measurement procedures for road race courses. Edwin Attard witnessed the measurement and may be relied upon to locate the points described in this report.

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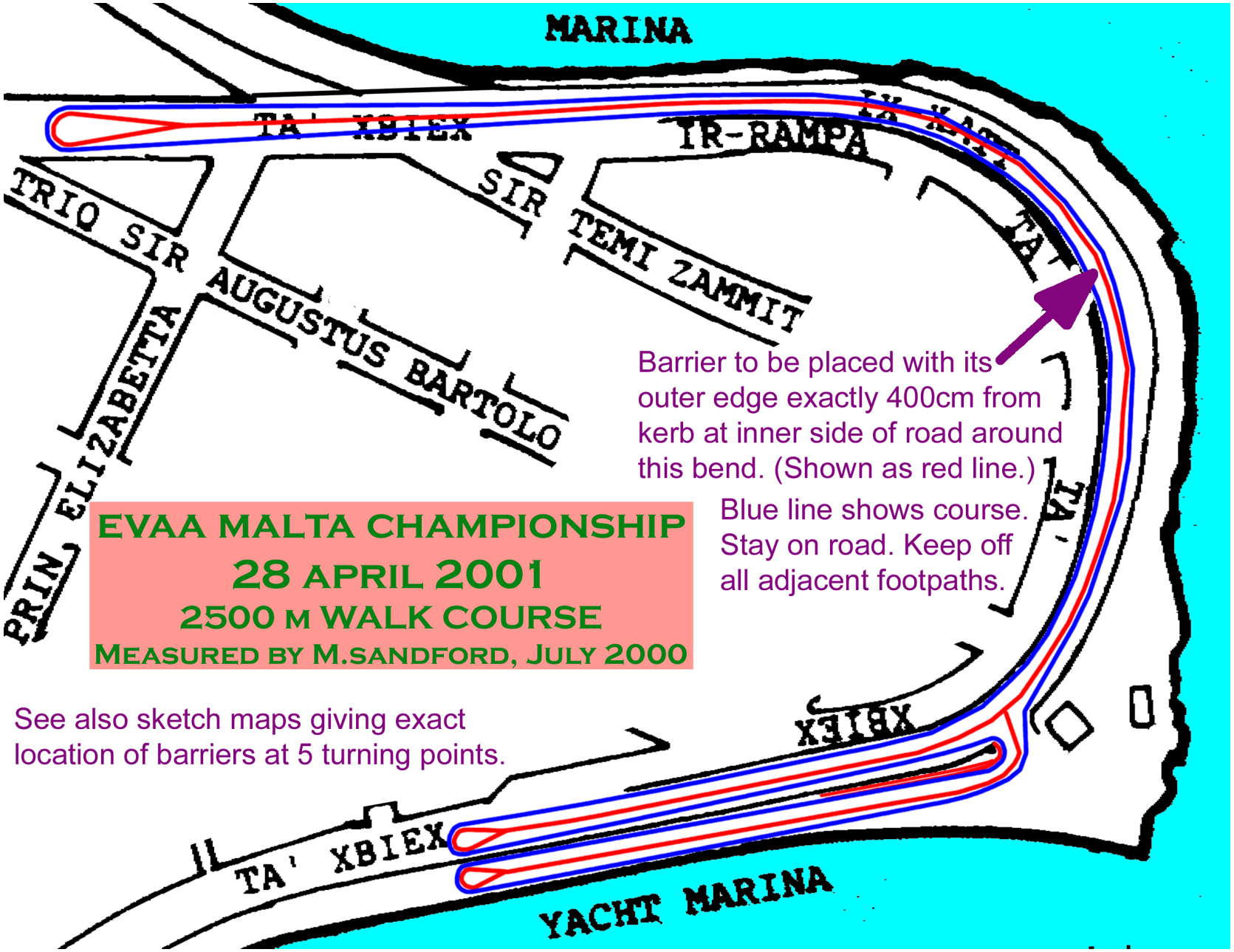
See Course Measurement Web Page at http://seaa.org.uk/coursemeasure/index.htm

Measurement of 2500 m Race Walk Course at Ta' Xbiex, Malta. 26 July 2000

Measurer: M.Sandford											
Calibration	0.293244	km course				Calibration	0.293244	km course			
1430	start	finish	difference	av.temp.F	C	1845	start	finish	difference	av.temp.F	C
ride 1	Paper with individual readings was lost. However the average ride length and temperature had already been calculated and recorded separately.			91	32.8	ride 1	69722.8	72913.6	3190.8	86.1	30.1
ride 2						ride 2	72913.6	76103.5	3189.9		
ride 3						ride 3	76103.5	79294.5	3191		
ride 4						ride 4	79294.5	82484.5	3190		
ride 5						ride 5	82484.5	85674.5	3190		
ride 6						ride 6	85674.5	88864.5	3190		
		average	3189.3	10886.8	cts/km			average	3190.283	**10890.16**	cts/km
				17520.61	cts/mile					17526.01	cts/mile
Starting Time				1800	1815						
Average Temperature				86F	85.5F	Constant for day = Post Cal since temperature was closest					
Point A, 4.3m from kerb, counts				19000	45800	Go via Marina Quay side Car Park then along Ix-Xatt Ta' Xbiex					
Point A, 0.3m from kerb, counts				31691	58492						
Point CTC turn round, counts				38637	65438.5						
				metres	**metres**						
A to A via Quay side				1165.36	1165.46						
A - CTC 0.3m from kerb				637.82	637.87						
Back again to A				637.82	637.87						
Extra for 4.3m from kerb (for 140 degrees)				9.77	9.77						
One 4m semi circle turn				13.51	13.51						
Two 3m semi circle turns				20.73	20.73						
			TOTAL	**2485.03**	2485.21						
LENGTHEN BY ADDING ON AT PROVISIONAL POINT CTC				**7.49**	Done by moving point CTC back by 7.5 m = 6.6 m + 0.9 m						


MARINA
TA' XBIEX
IR-RAMPA
TRIQ SIR
SIR
TEMI ZAMMIT
AUGUSTUS BARTOLO
PRIN. ELIZABETTA
TA'
XBIEX
TA' XBIEX
YACHT MARINA
Barrier to be placed with its outer edge exactly 400cm from kerb at inner side of road around this bend. (Shown as red line.)
Blue line shows course. Stay on road. Keep off all adjacent footpaths.
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28 APRIL 2001
2500 M WALK COURSE
MEASURED BY M.SANDFORD, JULY 2000
See also sketch maps giving exact location of barriers at 5 turning points.

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LOCATION OF TURNING POINTS