

**COURSE MEASUREMENT SUMMARY SHEET**EVENT: **IAAF WORLD HALF MARATHON CHAMPIONSHIPS**LOCATION: **BRISTOL, UK**DATE: **7 OCTOBER 2001**Promoting Organisation: **BRISTOL CITY COUNCIL / GREAT WESTERN RUNNERS**

Name & Address of race director	<b>Peter Hier</b> <b>30 Baylie Street</b> <b>Stourbridge</b> <b>West Midlands DY8 1AZ</b>	Course Director: <b>Mike Gott</b> <b>5 Providence View</b> <b>Long Ashton</b> <b>N Somerset BS41 9DH</b>
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Distance: **not less than 21,097.5m**Measured by: **Hugh Jones**Date: **27/02/2000 & 11/06/2001**Measurement method: **Jones counter mounted on bicycle wheel**Elevation, if not same, of: **START c.5m** **FINISH c.5m**Distance, in straight line, between start & finish: **identical****Description of the Course**

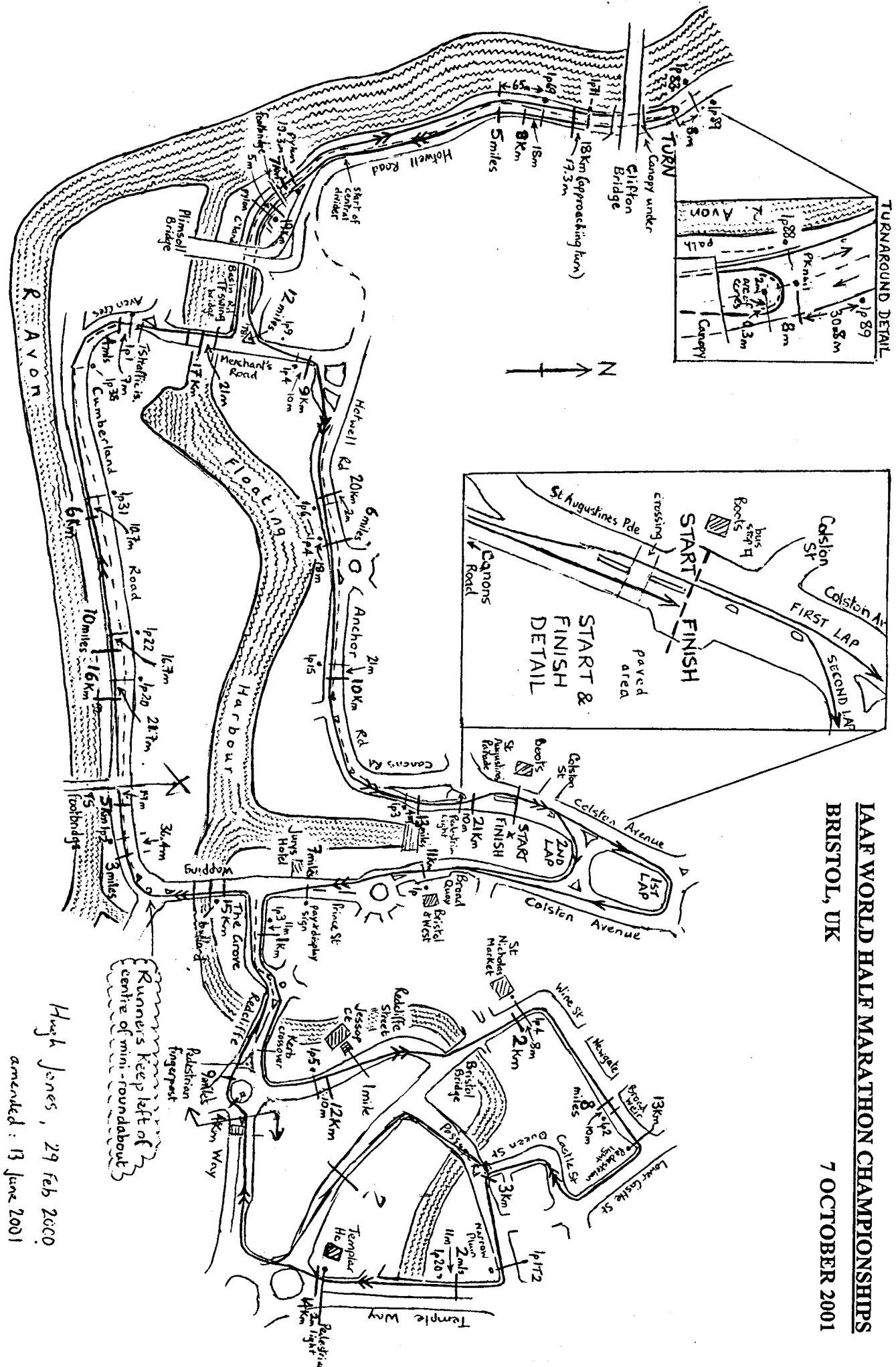
- i) Terrain: **Flat**
- ii) Race surface: **Tarmac city streets, some short cobbled sections.**
- iii) Course configuration: **Two laps (21km), second shortened near start by 224.2m**

**Measurement Details**

- i) Section of road available: **Entire width of roadway or carriageway if divided, except at The Grove, Cumberland Road, Avon Crescent, Cumberland Basin Road, Hotwell Road and Anchor Road where half width of road is used.**
- ii) Line to be taken at turns: **Shortest route keeping within limits specified in (i) above and keeping left of the centre of the mini roundabout at the start of Cumberland Road (4.8/15.4km)**

SIGNED: .....

DATE **13 June 2001**



**IAAF WORLD HALF MARATHON CHAMPIONSHIPS  
BRISTOL, UK  
7 OCTOBER 2001**

Hugh Jones, 29 Feb 2000.  
amended: 13 June 2001

Runners keep left of  
centre of mini-roundabout

## IAAF WORLD HALF MARATHON CHAMPIONSHIPS

**BRISTOL, UK**

**7 OCTOBER 2001**

I had attended a Bristol Half Marathon 2000 Technical Committee meeting in January, at which I was asked to measure the course. The same course will also be used for the World Half Marathon Championships in 2001.

I reconnoitred a location previously selected from an AtoZ as a likely spot for a calibration course on Feeder Road, near to Temple Meads Station. I returned here later to lay out a calibration course with the help of my son, Nathan. We completed this quickly (see calibration course sheet attached) and I then calibrated in order to make a rough measurement of the course.

Starting from a position on St Augustine's Parade, I measured in the running direction for 3km but then had to measure a 1km section in reverse to avoid riding against traffic. Resuming the measurement in sequence, I noted a turnaround reference at the end of the canopy under the Clifton Suspension Bridge. It was essential to adjust the course so that the turnaround would be located beyond the canopy. Restarting, I measured back from the end of the canopy to the starting point. The distance of the lap as measured (10605m) implied a need to shorten the lap by 56m, which would then put the turnaround in the undesired location.

I discussed this problem with race director Ray Jaeckels and course director Mike Gott back at the hotel. I had diverged from the intended course slightly by using the full width of the road instead of half-width in places, and in the way I negotiated some of the roundabouts. These slight changes would not have made enough difference to put the turnaround point beyond the canopy. It was thought that the best way to achieve this would be to shorten the route immediately after starting the second lap, and the difference would be about 230m (ie extending the turnaround location by about a quarter of this distance).

I calibrated at 05.40 on Sunday morning (27/02/00) and measured the section in reverse (4th kilometre) first. I then measured the difference between the 'long' and 'short' variations at the start of the lap, and found it to be 224.2m. This implied that the first, longer, lap would have to be fixed as a quarter-marathon plus half of the difference ( $21097.5/2 + 112.1 = 10660.8\text{m}$ ), and the second lap would be 224.2m less than this.

I measured the first 3km, stopping to note reference points for split mile and kilometre points as I went, and sometimes to check on the precise running line to be enforced. I stopped at the 2 mile reference and moved on to the point at which I could restart the sequential measurement after adding the previously recorded counts to the counter reading. This gives the appearance of an unbroken measurement ride, and there were no split marks to be located on the 'reverse-measured' section other than 4km, very close to the end of it, which I obtained with a separate, supplementary measurement.

Continuing the ride to beyond the bridge canopy I turned around and restarted at lp89. Riding to the end of the lap, I again took split references, but I could not be certain that these would necessarily be very close to the actual kilometre points concerned. The last part of the lap involved riding against traffic, and I decided to make a check on my measurement by repeating this section in reverse. In fact it turned out to be virtually identical but gave me the chance to locate new references closer to the split positions.

I repeated the procedure for the second lap, riding the shorter variation soon after the start, and reached the turnaround reference with a measurement only a single count different, once the 224.2m difference had been accounted. I recalibrated at 10.00 and returned to the hotel for breakfast. After recalculation using the average constant I returned to the finish at about 11.40

and used the finish constant to lay out the final few split references in reverse. This led me to make a simple mistake in calculating the location of the turnaround point. By inadvertently using the finish constant for the overall measurement calculation as well as the layout of the final splits I overestimated the amount by which I had to measure back from the turnaround reference to locate the centre of the turnaround circle. I fixed a PK nail in the centre of the roadway 30.8m before my lp89 reference - exactly level with lp88 in fact - but this was slightly too much. Using the average constant, as I had meant to, the centre of the turnaround circle should be only 30m short of lp89. HOWEVER, a subsequent small change to the course to be used for the 2001 race at 4km lengthened the lap by 17.7m, so the turnaround should be shortened (moved towards the start) by a further 8.85m. This means that the centre of the turnaround circle, of 2m radius, (2.3m radius to the running path) should be located 38.85m south of lamp-post 89, and 8.05m south of the PK nail.

### To fix course length:

1st lap - 10,660.85m; 2nd lap 10436.65m

Start to lp89 = 72860/9.386752 + 17.7m) - *\*see details below*

lp89 to finish = 27706/9.386752 m ) = 10731.3m + turn circle of (2.3 x pi)m  
= 10738.52m, or 77.68m overdistance

Therefore centre of turnaround circle should be located 38.84m before (south from) lp89, or 7.84m south of position marked with PK nail.

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### **\*Adjustment made on 11 June 2001:**

stopline on Redcliffe Way, before bridge	77000
via old route to: TF drain after Phippen St	79099 = 2099
TS of roundabout to:	80000
TF of drain after Phippen St,	80608
then from TS of roundabout	80608
via new route to stopline before bridge:	82297 = 2297

**2001 route is [(2297-2099)/11.180043] = 17.7m longer than 2000 route**

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reading	count	distance	adj.distance	location
70000	00000			St Augustine's Parade, TF traffic island outside Boots
79291	9291	989.1m		lp3, The Grove (LHS)
85111	15111	1609.8m		Redcliffe St, central rail of staircase to Jessop Court (LHS)
88852	18852	2008.3m		lp4, High Street (LHS, outside St Nicholas' Market)
98165	28165	3000.5m		Stop line at end of Queen St (at turn into Passage Street)
<b>99364</b>	<b>29364</b>	<b>3128.23m</b>	<b>+8790counts</b>	lp 1T2, Narrow Plain (RHS)
00318	30318	3229.8m		lp20, Temple Way (RHS)
<b>RESTART WITH 8790 COUNTS ADDED (= 08154) AS PREVIOUSLY MEASURED IN REVERSE:</b>				
<b>08154</b>	<b>38154</b>	<b>4064.66m</b>		Redcliffe Way, kerb at crossover into south carrigeway
(-940 counts for 4km reference)				
	37214	3964.5m		TS of zebra on Redcliffe Way, before Redcliffe Roundabout
<b>RE-ROUTING OF COURSE AT ROUNDABOUT ADDS 17.7m</b>				
15495	45495	4846.7m	<b>4864.4m</b>	First lp on LHS, Cumberland Road (no number) <i>tel.pole@ -33m</i>
16945	46945	5001.2m	<b>5018.9m</b>	Cumberland Road, level with TS side of footbridge (LHS)
26255	56255	5993.0m	<b>6010.7m</b>	lp31 Cumberland Road (RHS)
30482	60482	6443.3m	<b>6461.0m</b>	TS side of traffic is, end of Avon Crescent (LHS) - <i>lp1@ -17.4m</i>
35638	65638	6992.6m	<b>7010.3m</b>	Cumberland Basin Road, last floodlight pylon before Hotwell Rd
42300	72300	7702.3m	<b>7720.0m</b>	end of Canopy, Hotwell Road (LHS)
42860	72860	7762.0m	<b>7779.7m</b>	lp89, Hotwell Road (RHS)

RESTART, ADD 72860 COUNTS AND 7.2m TURN CIRCLE, THEN ADJUST BY -77.7m

43000	00000	7762.0	>> 7709.2m	lp89, Hotwell Road (RHS)
45247	2247	+239.3	7948.5m	lp70T45, Hotwell Road (RHS)
45560	2560	+272.7	7981.9m	lp69T44, Hotwell Road (RHS)
54474	11474	+1222.3	8931.5m	lp9, Merchant's Road (LHS)
[remaining splits (6miles & 10km) laid out in reverse from end of lap, see below]				
70706	27706	+2951.6	10660.8m	St Augustine's Parade, TF traffic island outside Boots

REVERSE MEASUREMENT FOR LAYOUT OF SPLITS:

71000	00000		10660.8m	St Augustine's Parade, TF traffic island outside Boots
77398	6398	-681.6	9979.2m	lp15, Anchor Road (RHS)
80601	9601	-1022.8	9638.0m	lp4, Hotwell Road (RHS)
86683	15683	-1670.7	8990.1m	lp4, Merchant's Road (RHS)

[Ref.note: +546 counts from lp4-lp9, Merchant's Road]

SECOND LAP:

03000	00000		10660.85	St Augustine's Parade, TF traffic island outside Boots
06186	3186	339.4	11000.2m	Broad Quay, lp outside Bristol & West (LHS)
08673	5673	604.3	11265.1m	Prince St (LHS), pay & display sign opposite Jury's Hotel
15477	12477	1329.2	11990.0m	lp5, Redcliffe Street (LHS)
23874	20874	2223.7	12884.5m	lp2, Broad Weir (RHS)
24969	21969	2340.4	13001.2m	Pedestrian light at end of Broad Weir (RHS, turn into L. Castle St)
<b>30265</b>	<b>27265</b>	<b>2904.6</b>	<b>+8790counts</b>	lp 1T2, Narrow Plain (RHS)
34325	31325	3337.1	13998.0m	Temple Way TS pedestrian light (RHS) outside Templar's House

RESTART WITH 8790 COUNTS ADDED (= 39055) AS PREVIOUSLY MEASURED IN REVERSE:

39055	36055	3841.0	14501.9m	Redcliffe Way, kerb at crossover into south carrigeway
(-181counts for 9mile reference)				

**RE-ROUTING AT ROUNDABOUT ADDS 17.7m**

	35874	3821.7	<b>14500.3m</b>	Pedestrian fingerpost, Redcliffe Way TF of roundabout (LHS)
43890	40890	4356.1	<b>15034.7m</b>	Wapping Road, at end joint of swing bridge - <i>bollard @ -32.1m</i>
53155	50155	5343.1	<b>16021.7m</b>	lp20, Cumberland Road (RHS)
53986	50986	5431.7	<b>16110.2m</b>	lp22, Cumberland Road (RHS)
62539	59539	6342.3	<b>17020.9m</b>	TF end joint of swing bridge, Merchant's Road
69234	66234	7056.1	<b>17734.7m</b>	lp63, Hotwell Road (LHS)
71887	68887	7338.7	<b>18017.3m</b>	lp71, Hotwell Road (LHS)
73754	70754	7537.6	<b>(18216.2m)</b>	lp89, Hotwell Road (RHS)

SPLIT km & mile LAYOUT IN REVERSE FROM FINISH, USING FINISH CONSTANT

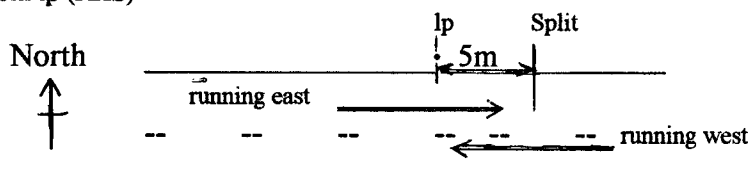
62000	00000		21097.5m	St Augustine's Parade, TF traffic island outside Boots
63006	1006	-107.2	20990.3m	Pedestrian light, LHS, entering St Augustine's Parade
63688	1688	-179.8	20917.6m	lp3, RHS of slip road from Anchor Rd to St Augustine's Parade
72278	10278	1095.1	20002.3m	lp6, RHS Hotwell Road
77681	15681	1670.9	19426.6m	lp4, RHS Merchant's Road
78227	16227	1729.0	19368.4m	lp9, LHS Merchant's Road
78755	16755	1785.3	19312.2m	opposite directional sign T8, at left turn into Merchant's Road
81640	19640	2092.7	19004.8m	Cumberland Basin Rd, floodlight pylon TF of footbridge (LHS)

Abbreviations:

LHS - left hand side                      TS - towards start                      lp - lamp-post  
RHS - right hand side                      TF - towards finish                      o/s - outside

The above terms are all used *in the running direction* (see sketch below)

- i) If running east, the split is 5m TF from lp (LHS)
- ii) If running west, the split is 5m TS from lp (RHS)



**List of split kilometre & mile positions:**

START - Level with end traffic island, outside Boots in St Augustine's Parade

- 1km The Grove, 10.9m past lp3 (LHS)
- 1mile Redcliffe Street, level with central rail of staircase to Jessop Court (LHS)
- 2km High Street, 8.3m before lp4 (LHS, outside St Nicholas' Market)
- 3km At stop line at end of Queen Street (turning left into Passage Street)
- 2miles Temple Way, 11.1m before lp20 (RHS)
- 4km South side of Redcliffe Roundabout, 3m past water cover (RHS)
- 3miles Cumberland Road, 3.4m before first tel.pole (LHS)
- 5km Cumberland Road, 18.9m before TS side of footbridge (LHS)
- 6km Cumberland Road, 10.7m before lp31 (RHS)
- 4miles end of Avon Crescent, 7m before lp1 (LHS)
- 7km end of Cumberland Basin Road, 10.3m before floodlight pylon

TURNAROUND CIRCLE (1st lap) AT 7702-7709m (radius of 2m, running path =  $2.3m \times \pi$ )

- 8km Hotwell Road (after turnaround, heading south), 18m past lp69T44 (RHS)
- 5miles Hotwell Road, 7.4m before lp67T44 (RHS)
- 9km Merchant's Road, 9.9m past lp4 (RHS)
- 6miles Hotwell Road, 18m past lp4 (RHS)
- 10km Anchor Road, 20.8m past lp15 (RHS)

END OF FIRST LAP AT 10660.8m

- 11km Broad Quay, at lp outside Bristol & West (LHS)
- 7miles Prince St, at pay & display sign (LHS), opposite Jurys Hotel
- 12km Redcliffe Street, 10m past lp5 (LHS)
- 8miles Broad Weir, 9.8m before lp2 (RHS)
- 13km 1.2m before pedestrian light at end of Broad Weir (RHS)
- 14km Temple Way, 2m past TS pedestrian light outside Templar House (RHS)
- 9miles Redcliffe Way, 16.2m before pedestrian fingerpost, after roundabout (RHS)
- 15km Wapping, 2.6m before 1st bollrd before swing bridge
- 16km Cumberland Road, 21.7m before lp20 (RHS)
- 10miles Cumberland Road, 16.7m before lp 22 (RHS)
- 17km Merchant's Road, 20.9m before end of swing bridge
- 11miles Hotwell Road, 31.9m before lp63 (LHS)
- 18km Hotwell Road, 17.3m before lp71 (LHS)

TURN CIRCLE (2nd lap) AT 18198-18205m (radius of 2m, running path =  $2.3m \times \pi$ )

- 19km Cumberland Basin Road, 4.8m before 2nd floodlight pylon (after footbridge)
  - 12miles At left turn into Merchant's Road, opposite traffic sign 'T8' (RHS)
  - 20km Hotwell Road, 2.3m before lp6 (RHS)
  - 1km to go Hotwell Road, 22.8m past lp4 (RHS)
  - 800m to go - to be taped before race day
  - 600m to go Anchor Road, 81.6m past lp15 (RHS)
  - 400m to go - to be taped before race day
  - 300m to go - to be taped before race day
  - 200m to go 20.1m before lp3, RHS of slip road-from Anchor Rd to St Augustine's Pde
  - 100m to go 7.2m past pedesrian light (LHS) entering St Augustine's Parade
- FINISH - Level with end traffic island, outside Boots in St Augustine's Parade

## **CALIBRATIONS**

### ***FOR BASIC MEASUREMENT, 2000-02-27***

On 500m steel-taped calibration course on Feeder Road

#### **Pre-measurement, 05.40, 10.5C**

start	end	counts
10000	14689.5	4689.5
15000	19690	4690
20000	24689.5	4689.5
25000	29689.5	4689.5

Average - 4689.625 (x2, x1.001)

Working constant - 9.3886292/m

**Constant for the Day (Average) = 9.386752/m**

#### **Post-measurement, 10.00, 12C**

start	end	counts
21000	25689	4669
26000	30687	4667
31000	35688	4668
36000	40687	4667

Average - 4687.75 (x2, x1.001)

Finish constant - 9.3848755/m

### ***FOR ADJUSTMENT, 2001-06-11***

On 500m steel-taped calibration course on Feeder Road

#### **Pre-measurement, 14.30, 16C**

start	end	counts
29000	34585.5	5585.5
34585.5	40171	5585.5
40171	45756.5	5585.5
45756.5	51341.5	5585

Average - 5585.375 (x2, x1.001)

Working constant -11.18192/m

**Constant for the Day (Average) = 11.180043/m**

#### **Post-measurement, 15.15, 18C**

start	end	counts
99000	04583.5	5583.5
04583.5	10167	5583.5
10167	15751	5584
15751	21334	5583

Average - 5583.5 (x2, x1.001)

Finish constant -11.178167/m

**IAAF WORLD HALF MARATHON CHAMPIONSHIPS**  
**BRISTOL, UK 7 OCTOBER 2001**

I measured the course in Feb 2000, and observed the City race held on 8 October. I made a slight adjustment to the course on 11 June 2001:

After a rough measurement of the course I realised that the turning point of the lap would fall under the canopy under the Clifton Suspension Bridge, out of TV shot. Using a shorter route, right at the start of the second lap, the turning point could be pushed northward beyond the canopy (and into TV shot).

After calibration about 1km from the eastern end of the course I measured 4km-3km in reverse, to avoid later riding against the traffic. I then measured the difference between the 'long' and 'short' routes, which was 224.2m. This implied that the first, longer lap would have to be a quarter-marathon plus half of the difference ( $21097.5/2 + 112.2 = 10660.85\text{m}$ ), and the second lap 224.2m less than this.

Starting from the proposed start/finish on St Augustine's Parade I measured the first 3km, stopping to note reference points for split kilometres. I then moved on to the point at which I had started the section measured in reverse and advance the counter by the number of counts recorded for this section. This gives the appearance of an unbroken ride and makes calculations much simpler. Continuing to beyond the Bridge canopy I turned around and restarted at lp89, riding to the end of the lap. The last 1.8km of the lap was against traffic, and I decided to make a check on this section by repeating the measurement in reverse from the finish line. It turned out to be virtually identical, but also gave me the chance to locate new references closer to the split locations (beyond the turning point, these had been guessed).

I repeated this procedure for the second lap, riding the shorter variation immediately after the start and reaching the turnaround reference with only a single count of difference, once the 224.2m had been accounted. I recalibrated and used the average constant for overall length, but I then returned to the finish line to measure out the final few split references in reverse using the finish constant.

On 11 June 2001 I measured the difference between a new route and the old one for a 200m length of the course either side of the 4km point, going the opposite way around a roundabout. The new route proved to be 17.7m longer than the old route, so the turnaround point was retracted by half this amount. Below the calculation is presented as if done for the first time, without reference to the previous turnaround point:

To fix lap (and course) length: Course = 21097.5m; 1<sup>st</sup> lap = 10,660.85m; 2nd lap = 10,436.7m  
Start to lp89 =  $72860/9.386752 + 17.7\text{m}$  )  
Lp89 to finish =  $27706/9.386752$  ) =  $107731.3\text{m} + \text{turn of } 2.3\text{m} \times \pi$   
=  $10738.52\text{m}$  or 77.68m overdistance

Therefore the centre of the turnaround circle (radius 2m) should be located 38.8m before (south of) lp89, or 8.0m south of lamp-post 88

70000	counts	distance	adj.distance	St Augustine's Parade, TF traffic island outside Boots	
(re-routing of course adds 17.7m at 4km)					
42860	72860	7762.0m	7779.7m	lp89, Hotwell Road	
restart, add 72860 counts and 7.2m turn circle, then adjust by -77.6m					
43000				lp89, Hotwell Road	
70706	27706	2951.6m	10660.9m	St Augustine's Parade, TF traffic island outside Boots	
SECOND (SHORTER) LAP					
	reading	counts	distance	adj.distance	location
03000				10660.9m	St Augustine's Parade, TF traffic island outside Boots
(re-routing of course adds 17.7m at 14.4km)					
73754	70754	7537.6m	18216.2m	lp89, Hotwell Road	
restart, add 72860 counts and 7.2m turn circle, then adjust by -77.6m					
43000				lp89, Hotwell Road	
70706	27706	2951.6m	21097.5m	St Augustine's Parade, TF traffic island outside Boots	