

Measurement News

November 2002 • Number 116



A measurement seminar was held in Scottsdale, AZ in October, in response to a need for more trained measurers in the area. RRTC's Mike Wickiser was the main organizer, with Scottsdale's Tom LaBlonde as the on-site coordinator.

Pictured above are the participants. L to R: Gary Grierson, Frank Cuda, Norm Janoff, Pete Riegel (OH Certifier), Mike Wickiser (Chairman, RRTC), Tom LaBlonde, Gene Newman (AZ Certifier). Kneeling in front: Tom McBrayer (TX Certifier). A full report appears inside.

MEASUREMENT NEWS

#116 – NOVEMBER 2002

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Subscription cost:

MN is sent free to RRTC officers and certifiers, and AIMS/IAAF measurers. Others may obtain MN by sending \$20 (for a one year subscription - six issues) to the editor.

Deadlines

Material intended to be included in the January 2003 issue must be in the Editor's hands by December 24. Next issue will be mailed in early January.

ONLINE MEASUREMENT FORUM

All it takes to become a subscriber is access to email. Simply send to mnf-list-on@rrtc.net (It makes no difference what you put in the subject and body of these email requests.)

Note: After sending a request to subscribe or unsubscribe as described above, you will receive an automatically emailed confirmation request. Reply according to instructions in that email in order to complete the subscription or unsubscription process.

To post messages to the list, send email to mnforum@rrtc.net. Please keep your comments in the body of the email (no attachments please). Also, please send only plain text; i.e., avoid formatted (HTML) messages (If you use HTML formatting, the formatting will be removed).

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Visit the RRTC website at:

<http://www.rrtc.net>

A complete list of certified courses may be downloaded from this site.

A complete USATF measurement book can be downloaded from this site.

ABOUT MEASUREMENT NEWS

Measurement News (MN) is the newsletter of the Road Running Technical Council (RRTC) of USA Track & Field (USATF). MN is our way to talk to one another, so that we all know what's going on.

MN is also sent to many foreign measurers associated with AIMS and IAAF, who are also invited to participate in the dialogue.

MN is published bimonthly beginning in January (six issues per year).

If you wish to reproduce or report on anything in MN, go ahead, but an attribution would be appreciated.

MN wants to make road course measurement as good as it can be. All opinions and grievances are solicited. No cows are sacred. If you have a new measurement technique, or if you think things should be done differently, send in your contribution to MN. Your opinion will be given space. Nothing changes until somebody tries!

Electronic copy or clean typed material is most welcome, but send what you can.

MEASUREMENT NEWS

Issue #116 – November, 2002

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Chairman's Clatter - From Mike Wickiser

New MN Editor: Jim Gerweck has taken over as editor for Measurement News. Since Jim is also the administrator/mediator for MNForum it may be necessary to create a new classification for his combined duties. Maybe something like media Czar! Welcome to extra work, and thanks for keeping MN going Jim.

As a result of these added duties, Jim has relinquished his duties as Indiana state certifier. Until a replacement is named, all measurements for that state should be sent to me.

Measurement Seminar: Pete Riegel, Tom McBrayer, Gene Newman and myself got together in Phoenix October 5 & 6th to help local runners and measurers. With the aid of local measurer Tom LaBlonde we had a successful measuring session with a local interested group. We met inside a gated community, which provided an excellent venue for the seminar.

USATF National Convention: It is time to start planning for RRTC meetings at the convention. Agenda items are always welcomed. Currently there are a few items of interest.

David Katz has submitted rules changes to allow for net chip times to be accepted for masters age group records and Phil Stewart has a proposal to change the acceptable separation value from 30% to 50 % for records consideration and do away with wind evaluation for point to point courses.

Bill Glauz has graciously offered to provide a pacing course for the annual contest.

A handwritten signature in black ink that reads "Mike Wickiser". The signature is written in a cursive style with a small arrow pointing to the right below the name.

Call for Papers

As I wind down my involvement in the managerial side of course measurement, I have taken on a new project. Over the years I have acquired files full of interesting material. I want to make it generally available to all who have an interest.

I have scanned most of what I have, and have transferred it to a single CD. The CD has plenty of room left on it, as my material so far occupies only 76 MB of the over 600 MB of space available on the disk. All the files have been converted to PDF format.

The files fall into two categories so far - measurements and seminars. I believe there is room for several more categories, such as technical articles, validation narratives and others yet to be thought of.

You all have generated a lot of good stuff over the years, and the best of it ought to be on the disk. I am inviting you to send me whatever material you have done that you would like to see retained and distributed in this archive. It would be a shame if 20 years of what we have done simply vanished, when it is so easy to preserve and distribute it.

So, there you are. I would love to have some form of electronic copy, as that would save me a lot of scanning. But most of my stuff was on paper, and I had to scan it. I will take what you send, however you care to get it to me. When I judge that the well is going dry, I will send every contributor a disk with everything on it.

What you send will not be edited in any way.

Ideas are solicited. The index that follows is only a rough draft. Its form and content will change.

INDEX TO REPORTS

Year	Category	Title	
1984	Olympic Measurement of	1984 Olympic Marathon	1989 Seminar "Seminar - Crystal Palace, Great Britain"
1988	Olympic Measurement of	1988 Olympic Marathon	1989 Seminar "Seminar - Warsaw, Poland"
1996	Olympic Measurement of	1996 Olympic Marathon	1991 Seminar "Seminar - Penang, Malaysia"
1994	Seminar "Seminar - Phoenix, AZ, USA"		1990 Seminar "Seminar - Jakarta, Malaysia"
2002	Seminar "Seminar - Phoenix, AZ, USA"		2002 Seminar "Seminar - Monterrey, Mexico"
1986	Seminar "Seminar - Seoul, Korea"		1992 Seminar "Seminar - West Jefferson, OH, USA"
2000	Olympic Measurement of	2000 Olympic Marathon	1995 Seminar "Seminar - Santa Barbara, CA, USA"
1999	Seminar "Seminar - Vancouver, BC, Canada"		1993 Seminar "Seminar - Nice, France"
1996	Seminar "Seminar - Bogota, Colombia"		1991 Measurement XXIV Semana Internacional de Marcha
1999	Olympic Measurement of	2000 US Men's Olympic Trials	1997 Measurement Rio de Janeiro Half Marathon
2000	WC Measurement of	2000 World Championships	1998 Measurement XVIII Juegos Deportivos Centroamericanos y del Caribe
1990	Seminar "Seminar - Columbus, OH, USA"		
1995	Seminar "Seminar - Corbie, France"		
1995	Seminar "Seminar - Manaus, Amazonas, Brazil"		
1995	Seminar "Seminar - Mexico City, Mexico"		

Please send your good stuff.

Editor's Note - From Jim Gerweck

It's with a great deal of pride and no small measure of trepidation that I take over the mantle of editor of Measurement News, worn so nobly for lo these many years by Pete Reigel.

When I first became serious about measuring nearly a decade ago, I somehow stumbled across the RRTC, Measurement News, and Pete, more or less in that order. A note to Pete brought several back issue of MN, and I was pretty much hooked. Since then my involvement with measurement has grown, most notably as the moderator of MN's electronic online version, Measurement News Forum, an idea Pete dreamed up and talked me into doing. I've met many great people as a result, some of whom I only know via the internet, but nonetheless consider friends.

A few years ago Pete was good enough to send me the entire collection of MN issues (subsequently these were transferred to CDs; it would have been a hell of a lot easier if I'd know that was coming). What struck me was ho right from its inception, MN has been an educational tool as well as a medium for exchange of opinions among measurers.

While MNF has taken over much of that latter role, with far greater immediacy, I think there is still a need for a publication one can physically hold and read, and refer to later. Thus, when Pete announced his intention to retire as MN editor, I volunteered to take up the torch.

I feel I have the qualifications to continue Pete's work, both from my experience with MNF as well as my position as an editor at Running Times. This first issue has been a learning experience, made tougher by the untimely demise (temporarily, I hope) of my home computer. In the future things should return to the timely schedule Pete became famous for.

I hope to continue MN's educational function, and along those lines this issue introduces a new variant on the standby Map of the Month. Instead, we hope to feature a Measurement of the Month, which will include not just the finished prodcut map, but a description of the process used to achieve it. This idea was suggested by Hugh Jones, frequent MN contributor and AIMS secretary, and so it seems fitting that his account of measuring the Robin Hood Marathon serves as the innau-gural installment of this feature.

Pete has said that he valued interesting material as more valuable than money for MN, and right now there are several great pieces in the bank. More will certainly be needed, so please don't hesitate to send them along.

As I said before, Measurement News has played a large role in my growth as a measurer. I hope, by continuing its tradition, I can give something back to this special community.

Yours in measuring,

Jim Gerweck

USATF MEASUREMENT SEMINAR

Scottsdale, Arizona

October 5, 2002

By Pete Riegel & Mike Wickiser

The seminar was organized by Mike Wickiser, who put a notice in September *Measurement News* and *MNForum* notifying all that it would be held. Some interest had been expressed by measurers and others in Phoenix, and given the interest, it seemed a productive thing to do. Western Vice-Chairman Tom McBrayer, Arizona Certifier Gene Newman, and Ohio Certifier Pete Riegel came to help.

Tom LaBlonde, a Phoenix measurer and resident of Scottsdale, handled all the onsite planning and organization. He found a superlative venue at Gainey Ranch Community Center, located on quiet roads within a gated community, with the Community Center itself serving as a classroom. He designed the course and drew a map for students to follow. He arranged for dinner afterward. The seminar went well, thanks to his competence and planning.



Students and staff met at the Community Center at noon, and were given a brief orientation by Mike Wickiser, after which the group went to a nearby bike path and laid out parallel 875 foot calibration courses. We were trying for 1000 feet, but ran out of room when the path curved. One calibration course was laid out by a team using a 165 foot steel tape, and the other by a team using a 100 foot tape. After layout, each team checked the work of the other.

Because time was limited, and we did not wish to spend time on explanations of temperature correction, we decided to assume both courses were exactly 875 feet in subsequent calculations.

A group of four (Gary Grierson, Frank Cuda, Tom LaBlonde, Norm Janoff) calibrated their bikes, and, led by Tom LaBlonde, who knew the course, measured the circuit. During the ride, Janoff became separated from the others and aborted his ride. He rode again later when Pete Riegel led him around the course.



After the riding was done, all repaired to the Community Center to calculate, drink Gatorade and eat cookies, provided by LaBlonde. Calculated results were posted on a board and discussed by the group.



Results of calculations may be seen on following pages.

Noteworthy things that can be seen in the calculations:

- 1) The two measurements of the #1 calibration course differed by $\frac{3}{8}$ inch, which is acceptable. The two measurements of the #2 calibration course differed by $1\frac{3}{4}$ inches, which is not very good agreement. One team or the other likely made some taping mistakes, most likely in setting down the proper zero point.

- 2) On postcalibration, everybody either equaled or had less variation than on precalibration, indicating the effect of concentration on straight riding.
- 3) Tom LaBlonde, with his skinny, high-pressure tire had less calibration change than did the others, who were riding fat-tire mountain bikes.
- 4) Riegel improperly reported his final figure, because he had neglected to include the 1.001 Short Course Prevention Factor in his day's constant. Since he was assisting Janoff with his calculations, Janoff suffered the same error. These errors were caught and corrected later. Check, check, check! Mistakes are inevitable, and checking thoroughly will catch most of them.

What constitutes a "good" measurement? It's impossible to tell without checking the actual course, but good measurement generally has the following characteristics:

- 1) Low variation among the four precal and postcal rides. How low? 1 or 2 counts on a 300 m or 1000 foot course is OK. This level can be achieved with practice.
- 2) Low change of constant between precal and postcal. This is often outside the control of the measurer. If a long day is planned, an extra calibration at midday is a good idea.
- 3) Good agreement between the overall measurements of the course. Our course contained a high level of turns, and this tended to spread out the measurements. Nevertheless, four of the five measurements agreed pretty well. And the fifth rider was aware that he had not followed a tight line.

CONCLUSION

Given the short duration of the seminar, it can be deemed a success. All interested individuals gained "hands on" experience with in depth assistance from a highly experienced group of instructors. Gene Newman having recently been appointed Arizona certifier was available to establish familiarity with measurers in the Phoenix area.

SCOTTSDALE MEASUREMENT SEMINAR

MEASUREMENT RESULTS - SATURDAY, OCTOBER 5, 2002

CALIBRATION COURSES

Two parallel courses were created.

#1 was laid out with a 165 foot steel tape and checked with a 100 foot steel tape.

#2 was laid out with a 100 foot steel tape and checked with a 165 foot steel tape

Temperature estimated at 90F

	#1	#2		
Layout Measurement, feet	875	875	874' 10 1/4 " =	874.8542
Check Measurement, feet	874.9688	874.8542	874' 11 5/8 " =	874.9688
Average Measurement, feet	874.9844	874.9271		
Temperature Correction factor	1-((90-68)*0.00000645)			
	1.000142			
Corrected length, feet	875.11	875.05		
Corrected Length, metres	266.73	266.72		

For the purposes of getting on with it, students were asked to use 875.00 feet as the calibration length.

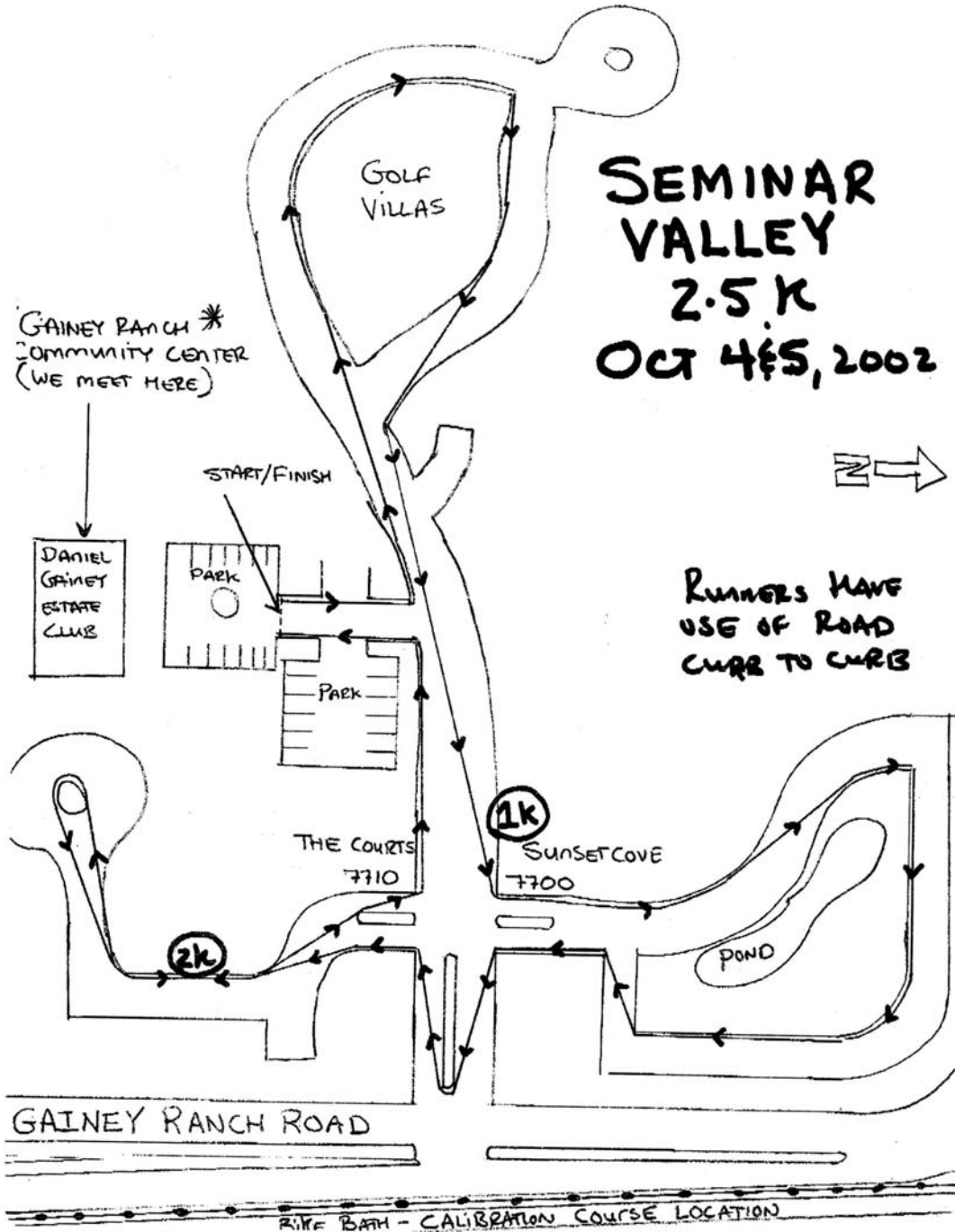
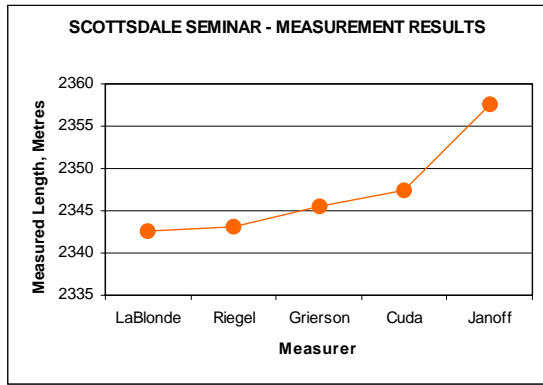
Assumed calibration length, metres = 875.00*0.3048 = **266.70 metres**

RAW MEASUREMENT DATA OBTAINED AT SEMINAR

	Gary Grierson	Frank Cuda	Tom LaBlonde	Norm Janoff	Pete Riegel
Precalibration	12313	15200	64800	1258	18300
	15354	18185	67815	4339	21341
	18394		70828.5	7416	24381
	21434	18200	73843	10492	27422
	24473	21183.5	76857	13568.5	30461.5
		24167			
		27154			
Begin Loop	37000	39000	89000	84200	41900
End Loop	63763	65298	115503	111432	68650
Postcalibration	78856	76800	27500	23064	80130
	81896	79781.5	30515	26141	83171
	84935	82766	33529	29216.5	86213
	87975	85747	36543	32293	89255
	91015	88731	39556.5	35367.5	92297

CALCULATED VALUES

	Gary Grierson	Frank Cuda	Tom LaBlonde	Norm Janoff	Pete Riegel
Precal 1	3041	2985	3015	3081	3041
Precal 2	3040	2983.5	3013.5	3077	3040
Precal 3	3040	2983.5	3014.5	3076	3041
Precal 4	3039	2987	3014	3076.5	3039.5
Average	3040	2984.75	3014.25	3077.625	3040.375
Counts per metre	11.39858	11.19141	11.30202	11.53965	11.39998
Counts per metre x 1.001	11.40997	11.2026	11.31333	11.55119	11.41138
Variation, counts/4 rides	2	3.5	1.5	5	1.5
Postcal 1	3040	2981.5	3015	3077	3041
Postcal 2	3039	2984.5	3014	3075.5	3042
Postcal 3	3040	2981	3014	3076.5	3042
Postcal 4	3040	2984	3013.5	3074.5	3042
Average	3039.75	2982.75	3014.125	3075.875	3041.75
Counts per metre	11.39764	11.18391	11.30156	11.53309	11.40514
Counts per metre x 1.001	11.40904	11.1951	11.31286	11.54462	11.41654
Variation, counts/4 rides	1	3.5	1.5	2.5	1
Day's constant (larger), counts/m	11.40997	11.2026	11.31333	11.55119	11.41654
Average constant, counts/m	11.4095	11.19885	11.31309	11.54791	11.41396
Change in constant, counts/km	-0.9	-7.5	-0.5	-6.6	5.2
Counts obtained on course	26763	26298	26503	27232	26750
Metres by larger constant	2345.6	2347.5	2342.6	2357.5	2343.1
Metres by average constant	2345.7	2348.3	2342.7	2358.2	2343.6
Reported on Site, metres	2345.6	2347.0	2342.6	2360.7	2345.4



From MNFORUM

STAIR MEASUREMENT

I have been trained to think purely in terms of horizontal distance but am wondering in the following situation whether it is fair to think of the actual distance traveled by the runner.

I am faced with measuring a course that goes over stairs twice. I had balked at measuring the length of individual stairs and thought I would measure them with a steel tape, measuring them two ways and comparing:

1) measure along a horizontal line, starting at the height of the top step and continuing to the same height to the bottom step. This should give the minimal distance.

or 2) along the diagonal touching the forwardmost point of each step to a point on the ground beyond the bottom step by a distance equivalent to the same angle. This would be my preference if the angles made by all the steps are the same.

The difference between the two measurements is likely to be small, so this may be a theoretical exercise of little import.

Does anyone have any experience or suggestions in measuring steps?

Tom Cotner
Seattle
tcotner@u.washington.edu

In the first year the New York City Marathon used a five-borough course, the runners were routed along the East River walkway, which included at least one flight of stairs. And the Bonne Bell 10k in Boston (now the Tufts 10k) included a pedestrian bridge where the runners had to go up and down steps as well.

Jim Gerweck
zgerweck@optonline.net

I have measured a lot of courses with stairs, but these are all very low profile races, or merely training routes. The first road course I ever ran, as an 11-year old schoolboy involved stairs up and down over one Thames bridge and down on another (the missing 'up' being a ramp). Many years later I measured this and did so merely by pushing the bike up the steps while making sure that the front wheel maintained contact from one stair edge to the next. This is not particularly accurate as the weight distribution on the front wheel is very different to during calibration. However, the pattern of motion probably replicates that of the body's centre of gravity while running up steps quite well.

To measure more accurately I would use option (2) - taping the diagonal along the stair edges. To measure just the combined length of the treads is to significantly underestimate the distance covered.

Hugh Jones
aimssec@aol.com

I've encountered this problem a number of times. I have no idea what is the fairest way to measure stairs but I usually form a seat-of-the-pants judgment and follow it.

In the old 36-Miler we used to hold, runners had to run up steps at Mount Vernon from George Washington's wharf up to the level of the mansion. The best I could do was roll my bike up all those steps.

In the Marine Corps Marathon (most years, not this time due to WWI Memorial construction) runners run up some steps near the Lincoln Memorial, but on race day the Engineers build a ramp right on top of the steps. So I've always placed my bike on the concrete "ramp" right beside the steps, and used that as a surrogate for the yet-to-be-built ramp

Finally, we've put on a 10K called the Bread Run that used to go up 56 "steps" consisting of large timbers placed into the ground across a footpath (this is near Glen Echo, MD, and the path goes

from the C&O Canal up to MacArthur Boulevard. I guess some of the steps were washed out— anyway, new twists and turns have bypassed where some of the steps were. Again, I just roll my bike along, over whatever obstacles crop up, and I figure it can't be but so far off (?).

The Bread Run is in early December, anyone wanting to research this matter is invited to the race and to have freshly baked bread and hot cider or coffee afterward!

Bob Thurston
thurret@aol.com

There is no proper procedure.(nothing in the manual I can find) It's a judgement call. The more experienced a measurer you are the more you understand what your procedure will be for measuring stairs. Although I've never measured stairs on a race course, I would only be concerned about 2 things: The length of the stairs, and the distance of the race course

If the course was for example; 5k and the stairs were 100m I would do what Hugh Jones suggested-steel tape it. If it was a marathon course I would get off my bike and roll my front wheel over the stairs. You would still be well within error because of the SCPF. Besides, who the hell would design a race course with stairs in it anyway?

Mike Bjelos
Mike_Bjelos@telus.net

Some race director with a sick sense of humor.

Actually, the 30k we put on in the spring and fall as a marathon tune-up "grew" stairs on its one hill (which is traversed twice on the double loop course). The runners ascend a 10 foot rise from the road to an elevated dirt bike path along what I guess is a flood control berm alongside a marsh. The first year it was just an inclined dirt path, but subsequently wooden ties have been installed to make it into a rough set of stairs. This has made it harder for the lead pace cyclist, who now must

dismount and carry the bike up the steps.

However, I have not remeasured it since the installation - over the course of a 15k layout, the change, as you note, is probably insignificant.

Jim Gerweck
zgerweck@optonline.net

ROUGH AND SMOOTH SURFACES

Dear Geoff,
You enquire as follows: "Let me put my query another way. Suppose we had 2 theoretical calibration courses side by side with minimal separation, 1 with a smooth surface and the other with a rough surface. Both courses measured by the steel tape method should yield the same start and end points. In riding both courses using the same bicycle, at best they should yield the same calibration, however, theoretically in my mind, the smooth course would yield a smaller constant (the difference being (and it may be minute) the smoothness of the smooth course compared to the roughness of the rough course)."

The theory you have in your mind is wrong! In May 1999 I did with a bicycle exactly the experiment you describe. I used 3 different pneumatic tyres and I shall give you the results below (I also tried a solid tyre, but I am not going to give the results of that since you say you are not interested in solid tyres.) All the results are described in much greater detail in a .pdf file at

http://website.lineone.net/~athletics/coursemeasurement/mn_surfpt4.pdf

For each tyre I first rode 4 rides on a smooth straight foot path and worked out the average counts between two nails marking the end points. Next I moved to a rough road beside the footpath and measured again between two nails which had been lined up very accurately opposite the nails on the footpath. Because of the accuracy that I set out the nails I knew the rough and the smooth courses were of the same length to better than 1 cm accuracy. I did not need to measure their exact length with a steel tape since my intention

was just to compare the counts on rough and smooth.

Finally I moved back onto the smooth footpath and rode 4 further rides to check that the tyre diameter had not changed for any reason. For each sequence I worked out the fractional change Rough/Smooth - 1 I give all the data for 3 pneumatic tyres with different rim sizes:

Michelin Tracer 23 mm rim width, 2 May 1999
0559 to 0640 F

Smooth Footpath 6778.4 6779.3 6779.2 6779.6
Average=6779.1 Rough Road 6773.4 6772.6
6773.6 6771.0 Average=6772.7 Smooth Footpath
6779.9 6778.9 6779.2 6780.4 Average=6779.6

$1000 * (\text{Rough}/\text{Av. Smooth} - 1) = -0.99 \text{ m/km}$

Michelin Tracer 25 mm rim width, 2 May 1999
0649 to 0727

Smooth Footpath 6713.9 6712.8 6714.0 6712.5
Average=6713.3 Rough Road 6709.2 6707.8
6708.0 6707.7 Average=6708.2 Smooth Footpath
6713.1 6711.5 6713.0 6711.5 Average=6712.3

$1000 * (\text{Rough}/\text{Av. Smooth} - 1) = -0.69 \text{ m/km}$

Michelin World Tour, 32 mm rim width 3 May 1999
0544 to 0620

Smooth Footpath 6510.0 6510.0 6510.2 6509.9
Average=6510.0 Rough Road 6506.5 6506.3
6506.3 6506.8 Average=6506.5 Smooth Footpath
6510.0 6510.2 6510.1 6509.7 Average=6510.0

$1000 * (\text{Rough}/\text{Av. Smooth} - 1) = -0.54 \text{ m/km}$

In each case you will see that the smooth surface gives the larger count and therefore larger constant. This is quite the opposite of the theory you have in your mind. I conclude that your theory is faulty. I also conclude that the description in the new measurement handbook is correct.

Please do not feel too upset at having your theory demonstrated to be wrong. I myself would have argued the same way as you have done, until

after a few year's measuring I noticed that pneumatic tyres did not behave as I expected. It was a few more years before I did the exactly the experiement you describe, however by that time I already knew what the outcome would be from other calibrations I had done on diffrent courses. The nice thing about this experiement is that it demonstrates the effect in a very clear and convincing way. The other nice thing from my point of view, as a measurer keen to understand accurately how measurement works, is that the result is counter intuitive. Also it would not have been discovered if I had not been trying to understand variations in calibration constant.

The other thing I want to point out is that this effect can occasionally be of great practical importance to measurers. You will see that for the first tyre the fractional change in calibration constant would be 0.99m/km which is almost exactly equal to the 0.001 SCPF. In unfavourable circumstances the safely factor provided by the SCPF could be absent. However perfect the measurer, he could lay out a short course, if he did not have an understanding of these effects and also develop a strategy of how to avoid them.

Mike Sandford -
m.sandford@lineone.net

Dear Mike

Thank you for your reply. It's not easy to eat humble pie, which I must do in this case. At least you were originally of the same opinion as me until you noticed some strange results and confirmed these by experiment. Your experiments were an excellent opportunity to compare rough and smooth road surfaces (being ideally alongside each other). Although one cannot refute the experimental evidence, it's still hard to come to grips with something that appears to fly in the face of logic. In one respect, it's comforting to know that pneumatic tyres on smooth surfaces will result in measured courses being at least the intended distance, more likely a little longer. I always use pneumatic tyres and the majority (if not all) of my calibration courses are smooth.

I've now taken the time to read your paper on the web site you recommended. I agree wholeheartedly with your recommendations that solid tyres not be used for measurements and that pneumatic tyres and smooth calibration courses are the best combination to ensure measured courses are not short. I rarely, if at all, measure courses with consistent road surfaces - they vary, often by a large amount, which would make it impossible to find a calibration course to replicate them.

Sorry for having made you write a detailed reply to me, I should have read your article on the web site first. Keep up the good work!

Regards

Geoff Hook
geoff.hook@maunsell.com.au

Thanks to Mike Sandford for reiterating his findings concerning calibrations with pneumatic tires over rough and smooth surfaces. A few years ago his research helped me solve a mystery that troubled me when I was doing some measuring in Richmond. My number of counts per kilometer over a particular calibration course fell so far short of what I expected that I had the race organizers re-measure the cal course. A surveyor found that it was indeed the half mile that it was purported to be. Turned out that the surface was rough, and that my results fit in very well with what Mike had reported as his findings.

Quite a few years back, when I always used a solid tire, I did a similar experiment and found quite the opposite result, in fact a result similar to what Geoff had predicted. I even found that some of my old courses, when remeasured using a pneumatic, were much shorter than I had thought, although the difference was "covered" by SCPF. That scared me off of solid tires and I've used pneumatic ever since. Anyway, it's more comfortable!

Bob Thurston
thurret@aol.com

FIXED TIME EVENTS

I have a query on fixed-time events where the results are variable distances.

Something that happened a year ago was that the Olander Park 24-hour had undergone a change of lap distance after repaving. With the race in progress, a question arose as to whether the lap counts were being multiplied by the old-versus-new measurement. So, the measurer came on-site and remeasured before the race ended. This confirmed which distance to use, and also indicated that the repaved course should pass validation if it ever came to that.

But, hypothetically, what if the in-progress remeasurement had indicated a validation problem? Or what if any post-race validation measurement had failed? If an athlete sets a record by a large margin in a fixed time event, and the course turns out to be short by a smaller margin, could recalculated distances be ratified as records?

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GLOBAL POSITIONING SYSTEM

Readers interested in Global Positioning System (GPS) should check out:

www.mercat.com/QUEST/Intro.htm
www.dkart.ru/gps.htm
www.useu.be/Galileo/Feb1202GalileoBraibanti.html

Find out about the US's GPS, Russia's GLONASS, and the European Union's plan for a new one (Galileo).

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USATF/RRTC CERTIFIED COURSE LIST
New Entries, September - October 2002

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	m/km DROP	pct SEP	MEASURER	REPLACES
10 km	AL 02011 JD	A	Huntsville	Cotton Row Run #2	0	1.5	J DeHaye	
5 km	AL 02012 JD	A	Huntsville	Galaxy of Lights	1.2	3.6	J DeHaye	
5 km	AL 02013 JD	A	Hartselle	Depot Days 5k	1.8	9.2	R Melanson	AL 96016JD
42.195 km	AL 02014JD	A	Mobile	First Light Marathon	0	0.5	L Mattics	AL 01021JD
20 km	AL 02015JD	A	Birmingham	Hog Jog 20k	-0.3	1.1	R Melanson	AL 00016JD
5 km	AL 02016JD	A	Birmingham	Hog Jog 5k	-0.6	1.6	R Melanson	AL 00014JD
5 km	AR 02006 DLP	A	Wynne	Flat as a Pancake 5k	0	0.73	D Reagler	
5 km	AR 02007 DLP	A	N. Little Rock	Arkansas River 5k	0	1.8	J Curry	AR00009 DLP
5 km	AR 02008 DLP	A	Little Rock	The Race for the Cure	-1.6	10.4	J Curry	AR99013 &94010 DLP
5 km	AR 02009 DLP	A	Little Rock	Otter Creek 5k	-0.4	1.3	J Curry	
10 km	CA 02006 TK	A	Palo Alto	Palo Alto Baylands 10 km	0	0	T Knight	CA 87022 TK
5 km	CA 02007 TK	A	Palo Alto	Palo Alto Baylands Alt. 5km	0	0	T Knight	
5 km	CA 02008 TK	A	Mountain View	Silicon Sneakers 5k Race	0	0	T Knight	
5 km	CA 02020 RS	A	Sacramento	Susan B Anthony 5km	0	1.3	D Scott	CA 91034 RS
10 km	CA 02021 RS	A	San Diego	Aids Walk San Diego 10km	-0.2	2.17	G Rahill	
5 km	CA 02022 RS	A	Culver City	Culver City 5km Course B	0	2.4	R Scardera	
5 km	CA 02023 RS	A	Pasadena	Komen Race for the Cure	0	2.6	R Scardera	CA 99059 RS
21.0975 km	CA 02024 RS	A	Folsom	Lake Natoma Half Marathon	0.3	1.15	D Thurston	CA 01061 RS
5 km	CA 02025 RS	A	Agoura Hills	Disco Dash 5km	0.6	4.8	R Scardera	
42.195 km	CA 02026 RS	A	Long Beach	2002 Long Beach Intl City MAR 0	0.77	0.77	R Scardera	CA 01057 RS
21.0975 km	CA 02027 RS	A	Long Beach	2002 Long Beach Intl. City HMAR 0	1.54	1.54	R Scardera	CA 01058 RS
8 km	CA 02028 RS	A	Coronado	Do the Bridge 8km	-0.26	23	G Rahill	
5 km	CA 02029 RS	A	Chula Vista	Arturo Barrios Invitational 5km	0	3.7	G Rahill	
21.0975 km	CO 02020 DP	A	Idaho Springs	Georgetown to Idaho Springs	13.7	82	C Kelley	CO 92026 DP
5 km	CO 02021 DP	A	Daniels Park	Run With the Herd	0	4	P Tanui	
5 km	CO 02022 DP	A	Castle Rock	Run the Rock	0	0	P Tanui	
10 km	CO 02023 DP	A	Golden	Climb For A Cure	0	0	P Tanui	
5 km	CO 02024 DP	A	Superior	Five Alarm 5	0	1	P Tanui	
Cal	CO 02025 DP	D	Durango	Raider Ave	0	100	C 28-Oct-02	
42.195 km	CO 02026 DP	A	Durango	Durango Marathon	2	3	T Navarro	
42.195 km	CO 02027 DP	A	Fort Collins	Easy Street	0	2	J Lonsdale	
5 km	CT 02013 DR	A	Deep River	Deep River 5k Run	0	1.5	GuidoBros	
5 km	CT 02014 DR	A	Woodridge	Woodridge Road Race	0	4.4	B Stephenson	
Cal	CT 02501 JG	A	Norwalk	Redcoat Road 300meter	0	100	J Gerweck	
1mi	DC 02031 RT	A	Washington	Pennsylvania Avenue Mile	0	0	R Thurston	
5 km	DC 02032 RT	A	Washington	National Run For Recovery	0	0	R Thurston	
5 km	DE 02002 GAN	A	Wilmington	Blue Rocks	0	1.7	D White	
5 km	DE 02003 GAN	A	Rehoboth Beach	J.J. 5k	0	0	T Bamforth	
42.195 km	FL 02001 WN	A	Lake Buena Vista	Walt Disney World Marathon	0	2.1	T Ward	FL 98001 WN
21.0975 km	FL 02002 WN	A	Lake Buena Vista	Walt Disney World Half Marathon	0.072	22.9	T Ward	FL 99001 WN
5 km	FL 02029 DL	A	Sunrise	Jingle Bell Jog	0	6.3	G Witkowski	FL 90018DL
5 km	FL 02030 DL	A	Hollywood	Dart for Art 5k	0	0.5	G Witkowski	FL 90018DL
5 km	FL 02031 DL	A	Tallahassee	Parents Weekend 5k Fun Run	1.8	4	B McGuire	
10 km	GA 02009 WC	A	Augusta	Broad St. Ramble Museum Start	0	0.1	T Crute	
10 km	GA 02010 WC	A	Augusta	Broad St. Ramble 6th -Milledge	0	1	T Crute	
10 km	HI 02032 PR	A	Honolulu	Kidney Foundation 10k	-0.06	30	R Pate	
21.0975 km	IA 02003 KU	A	Iowa City	Iowa City Half Marathon	0	0.04	K Ungurean	IA 94005 KU
0.3066 km	IA 02004 MF	A	Des Moines	The Equalizer 12 &24 hr.	0	0	C Voss	IA 01004 MF
0.125mi	IA 02004 MF	A	Des Moines	The Equalizer 12 &24 hr.	0	100	C Voss	IA 01004 MF
42.195 km	IA 02004 MF	A	Des Moines	The Equalizer 12 &24 hr.	0	1.2	C Voss	IA 01004 MF

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	DROP	SEP	MEASURER	REPLACES
50 km	IA 02004 MF	A	Des Moines	The Equalizer 12 &24 hr.	0	1.3	C Voss	IA 01004 MF
50mi	IA 02004 MF	A	Des Moines	The Equalizer 12 &24 hr.	0	0.7	C Voss	IA 01004 MF
100 km	IA 02004 MF	A	Des Moines	The Equalizer 12 &24 hr.	0	1.2	C Voss	IA 01004 MF
100mi	IA 02004 MF	A	Des Moines	The Equalizer 12 &24 hr.	0	0.5	C Voss	IA 01004 MF
Cal	IA 02004 KU	A	Iowa City	Sand Road 1/4 mile Calibration	0	100	T Anthony	
Cal	IA 02004 KU	A	Iowa City	Sand Road 1/2 mile Calibration	0	100	T Anthony	
42.195 km	IA 02005 MF	A	Des Moines	Des Moines Marathon	0.19	2	B Lorenz	
21.0975 km	IA 02006 MF	A	Des Moines	Des Moines Half Marathon	0.3	3	B Lorenz	
42.195 km	IL 02005 KU	A	Moline	Quad Cities Marathon	0	0	K Ungurean	IL 00015 KU
5 km	IL 02007 KU	A	Moline	Quad Cities Marathon 5k	0	0	K Ungurean	IL 98007 KU
5 km	IL 02065 JW	A	Bolingbrook	Parkie's 5k Family Fun Run	0	3	J Knoedel	
5 km	IL 02066 JW	A	Matteson	Run for Autism	0.3	1.8	C Hinde	IL 01084 JW
5 km	IL 02067 JW	A	Carol Stream	Anne Clarke Memorial Run	0.3	3.8	C Hinde	IL 01060 JW
5 km	IL 02070 JW	A	Wheaton	Convalescent Center 5k	0	4.2	C Hinde	
5 km	IL 02071 JW	A	Chicago	Race for the Cure	-0.3	5.2	C Hinde	IL 97048 JW
5 km	IL 02072 JW	A	Chicago	U N C F Run	0.3	1.2	C Hinde	
5 km	IL 02073 JW	A	Chicago	Trick or Treat Trot	0	1	J Knoedel	IL 96064 JW
10 km	IL 02074 JW	A	Chicago	Trick or Treat Trot	0	0.5	J Knoedel	
5 km	IL 02075 JW	A	Saint Charles	Scarecrow Scamper 5k	0	4.2	C Hinde	
5 km	IN 02004 JG	A	Columbus	Tour de Trails	0	0	R Stafford	
5 km	KS 02028 BG	A	Leawood	Leawood Labor Day	0	0	K Raymer	
5 km	KS 02029 BG	A	Overland Park	2002 Flag Run	0	0	B Taylor	
10 mi	KS 02030 BG	A	Overland Park	2002 Flag Run	0	0	B Taylor	
5 km	KS 02031 BG	A	Overland Park	Helen Gold	0	7.3	L Joline	
5 km	KS 02035 BG	A	Leawood	Cancer Awareness II	0	4.88	C Tuttle	
10 km	KS 02036 BG	A	Abilene	Chisholm Trail	0	0.5	L Richardson	
2 mi	KS 02037 BG	A	Abilene	Chisholm Trail	0.31	3.1	L Richardson	
5 km	KS 02038 BG	A	Abilene	Rocket Run	0	1	L Richardson	
4 mi	KS 02039 BG	A	Topeka	Capper Foundation	0	3.1	D Halferty	
5 km	KY 02033 PR	A	Louisville	Race for the Cure	0	2	P Mahoney	KY 00045 PR
5 km	LA 02003 JF	A	Thibodaux	Race for the Cure 5k	0	5.5	C George	
3.94377 mi	MA 02013 RN	A	Hanover	Thom Madjerec Memorial	0.14	4.2	R Nelson	
5 mi	MA 02014 RN	A	Berkley	Nancy L Crane Memorial	0	1.97	R Nelson	
5 km	MA 02015 RN	A	Taunton	St. Mary's Primary School 5k	0	0	R Nelson	
5 km	MA 02016 RN	A	Boston	5k Run for Asthma	0	3.17	R Nelson	
5 km	MA 02017 RN	A	Newton	Halloween Hustle 5k	0.5	4.7	R Nelson	MA 99027 RN
5 mi	MA 02018 RN	A	Attleboro	Ro-Jack's Run	0.08	4.2	R Nelson	MA 95010 RN
8 km	MA 02019 RN	A	Attleboro	Ro-Jack's 8k	0.08	4.8	R Nelson	
5 mi	MA 02020 RN	A	Boston	Ollie 5 Mile	0	11	S Vaitones	
Cal	MA 02021 RN	A	Lowell	Lowell Riverwalk 1000 ft.	0	100	S Vaitones	
5 mi	MA 02023 RN	A	Newton	Race to Stop Global Warming	0	2.8	S Vaitones	
10 km	MA 02034 RN	A	milton	Marine Corps 10k	-0.46	2.3	S Vaitones	
10 km	MD 02011 JS	A	Bethesda	Turkey Chase 10k	0	0.9	J Sissala	MD 01014 JS
5 km	MD 02012 JS	A	College Park	Terrapin Trot 5k	4.3	23	J Sissala	
5 km	MD 02013 JS	A	College Park	Zack's Run	0	1.5	J Sissala	MD 00010 JS
5 km	MD 02014 JS	A	Baltimore	Race for the Cure	0	6.2	J Sissala	MD 01010 JS
42.195 km	MD 02015 JS	A	Baltimore	Baltimore Marathon	0.07	1.7	J Sissala	MD 01012 JS
5 km	MD 02016 JS	A	Baltimore	FILA 5k	0.9	12.8	J Sissala	MD 02009 JS
5 km	MD 02017 JS	A	Silver Spring	Becca's Run 5km	-0.6	2.4	P Quinn	MD 99012 JS
15 km	MD 02028 RT	A	Greenbelt	Larry Noel 15k	0.5	0.9	R Thurston	
Cal	ME 02001 RN	A	Old Orchard Beach	E.E. Cummings Road 1000 ft.	0	100	S Vaitones	S Vaitones
5 km	ME 02002 RN	A	Old Orchard Beach	Breakaway 5k	0	10	S Vaitones	S Vaitones
5 km mi	MI 02034 SH	A	Saugatuck	Mt. Baldhead Challenge	0	0	r Dewey mi	00021 SH
5 km mi	MI 02035 SH	A	Rockford	Christ/Savior Run for Prize	0	1	R Dewey	
10 km mi	MI 02036 SH	A	Auburn Hills	Standard Federal	-0.1	1	S Hubbard	

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	DROP	SEP	MEASURER	REPLACES
5 km mi	MI 02037 SH	A	Detroit	Detroit Free Press/Compuware	1.6	5	S Hubbard	
42.195 km	MI 02038 SH	A	Detroit	Detroit Free Press Flagstar Bank	0.2	1	S Hubbard mi	01032 SH
5 km mi	MI 02039 SH	A	Grandville	Run for the Cure	0	2	R Dewey mi	00020 SH
10 mi mi	MI 02040 SH	A	Grand Rapids	The Bridge Run	0	1	R Dewey	
5 km mi	MI 02041 SH	A	Hudsonville	Hudsonville Fall Festival	0	0	R Dewey	
10 km	MN 02016 RR	A	Cross Lake	Cross Lake	0	0.4	R Recker	
5 km	MN 02017 RR	A	Brooklyn Park	Brooklyn Park	0	0	R Recker	
10 km	MN 02018 RR	A	Moorhead	Moorhead	0	2.7	R Recker	
5 km	MN 02019 RR	A	Raymond	Raymond	0	0.6	T Reagan	
1 mi	MN 02019 RR	A	Raymond	Raymond	0	90	T Reagan	
10 km	MN 02020 RR	A	Forest Lake	Forest Lake	0	0	R Recker	
4 mi	MN 02021 RR	A	PRoctor	McIntire	0	1.4	R Recker	
21.0975 km	MN 02022 RR	A	PRoctor	McIntire	0	1.6	R Recker	
5 km	MN 02023 RR	A	Burnsville	Burnsville	0	1.2	R Recker	
5 km	MN 02024 RR	A	St. Paul	Swede Hollow	0	0	R Recker	
5 km	MN 02025 RR	A	minneapolis	Nicollet Inn	0	4	R Recker	
5 km	MN 02026 RR	A	Victoria	Carver	-0.8	3.5	R Recker	
5 km	MO 02032 BG	A	Kansas City	Humana River Crown Plaza	0	0.32	L Joline	
5 km	MO 02033 BG	A	Grandview	Angel Flight	0	1.4	K Raymer	
5 km	MO 02034 BG	A	Riverside	2002 Riverfest	0	1.3	B Taylor	
5 mi	MO 02040 BG	A	Florissant	River City Road Race	0	0.6	D Sebben	MO97022 BG
Cal	MT 02001 GT	A	Laurel	River Road 1000 meter Cal.	0	100	J Devitt	
10 km	MT 02002 GT	A	Laurel	Big Sky Games 10k	0	0	J Devitt	MT 93007 GT
21.0975 km	MT 02003 GT	A	Laurel	Big Sky State Games HMAR	0	0	J Devitt	MT 93008 GT
Cal	MT 02004 GT	A	Choteau	Teton Canyon Rd. 1000 ft.	0	100	D Hisschfeld	
42.195 km	MT 02005 GT	A	Choteau	Grizzly Marathon	0	0	D Hisschfeld	
8 km	NC 02033 PH	A	Boone	Run For Fun 8k	0	0.4	D Joffe	
5 km	NC 02034 PH	A	Charlotte	Greek Fest 5k	0	0.14	T Rhodes	NC 01052 PH
Cal	NC 02035 PH	A	Elon	W. Lebanon Ave 500 meter	0	100	E Eng	
5 km	NC 02036 PH	A	Elon	Elon Festival of Oaks 5k	0	0.07	E Eng	
5 km	NC 02037 PH	A	Morrisville	Morrisville 5k	0	0.2	P Hronjak	
5 km	NC 02038 PH	A	Raleigh	Feet for the Fight	-0.55	1.35	P Hronjak	NC 01009 PH
5 km	NC 02039 PH	A	High Point	Future 5k	0.98	2.8	K Stone	
10 km	NC 02040 PH	a	New Bern	Crop Walk 10k	0	1.4	P Hronjak	
5 km	NC 02041 PH	A	New Bern	Crop Walk 5k	0	1.8	P Hronjak	
10 km	NC 02042 PH	A	Carrboro	Familias Del Pueblo	-0.15	0.5	D Forbis	
5 km	NC 02043 PH	A	Mt. Gilead	Mt Gilead Community Fair 5k	0	0	D Joffe	
21.0975 km	NC 02044 PH	A	Ashville	Ashville Citizen Times HMAR	0	0.07	B DeWeese	NC 00044 PH
Cal	NC 02045 PH	A	Ashville	Lower Grassy Branch 2640 ft.	0	100	B DeWeese	
5 km	NC 02046 PH	A	Wake Forest	Race for Bones	0	0	P Hronjak	
12 km	NC 02047 PH	A	Camp LeJeune	Marine Corps Half Marathon split	0.13	28	N Wood	
5 km	ND 02038 PR	A	Fargo	Red River Run 5km	0	0	D Summers	
15 km	ND 02040 PR	A	Fargo	Red River Run 15km	0	0	D Summers	
10 km	ND 20039 PR	A	Fargo	Red River Run 10km	0	0	D Summers	
5 km	NH 02010 WN	A	Nashua	Sleepy Hollow	-0.43	6.8	J Belanger	
5 km	NH 02011 WN	A	Derry	Derryfest	0.61	1.2	J Belanger	
5 km	NH 02012 WN	A	Bristol	NH Marathon Racewalk	-1.83	4.18	WNicoll	
10 km	NH 02014 WN	A	Portsmouth	Community Bridges 4 Friendship	0	0.3	R Fitzpatrick	NH 98029 WN
10 km	NH 02015 WN	A	Portsmouth	Jingle Bell Run for Arthritis	0	0.58	R Fitzpatrick	NH 02009 WN
2 km	NJ 02001 LMB	A	Ocean Township	USATF Nat'l Champ. 40k RW	0	0	L Baldasari	
5 km	NJ 02001 LMB	A	West Windsor	Mercer Co. Community College	0	0.2	L Baldasari	
5 km	NJ 02003 DB	A	Morris Plains	Pfizer 5k '02	0	4.2	D Brannen	NJ 01029 GAN
5 km	NJ 02028 GAN	A	Ocean City	Trail of Two Cities	0	7.5	G Newman	NJ 96012 GAN
5 km	NJ 02029 GAN	A	Bridgewater	Run for Runways 5k	0	9.7	L D'Ottavio	
5 km	NV 02006 BC	A	Reno	North Nevada Race for the Cure	0	0.07	D Thurston	NV 01001 BC
5 km	NV 02007 BC	A	Las Vegas	Bunker Family Park 5k	0	10	T Kelly	

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	DROP	SEP	MEASURER	REPLACES
1 mi	NY 02002 DK	A	Massapequa	Massapequa Merchant's Mile	2.27	100	D Katz	
5 km	NY 02003 DK	A	Oyster Bay	Vytra-Tobay Tri	0	1.4	D Katz	
5 km	NY 02046 AM	A	Buffalo	Nickel City 5k	0.4	12	J Grandits	NY 01034 AM
5 km	NY 02047 AM	A	Rochester	CAP Walk for Families 5 k	0	5	G Tillson	
5 mi	NY 02048 AM	A	Congers	Rockland Turkey Trot	0	2.8	P Hess	
5 km	NY 02049 AM	A	Buffalo	Jack's 5k	0.18	7.3	J Felix	
5 km	NY 02050 AM	A	Baldwinsville	Bud Run 5k	0	2	D Hughes	NY 00044 AM
5 km	NY 02051 AM	A	Buffalo	Charlene D. Page Memorial 5k	0	3.5	J Grandits	NY 01032 AM
5 km	NY 02052 AM	A	Victor	Victor Y 5k	6.3	15	G Tillson	
10 km	NY 02054 AM	A	New York	NYRRC Run for Liberty 10k	0.12	2.4	P Hess	
100 km	NY 02057 AM	A	Phonencia	100 km Catskill Mtn. Road Race	0.73	12.9	B Cavanagh	
10 km	NY 02058 AM	A	Middletown	Orange Classic 10 km	-2.9	1.3	B Cavanagh	
5 km	OH 02011 MW	A	Cleveland	Race for the Cure	1.28	5.5	MWickiser	OH 01016 MW
5 mi	OH 02034 PR	A	Hilliard	Old Hilliard 5 Miler	0	15	J Mason	OH 96031 PR
42.195 km	OH 02036 PR	A	Columbus	Columbus Marathon	0.25	2.1	P Riegel	
Cal	OH 02037 PR	A	Monclova	Wabash Cannonball Trail 1000 ft	0	100	E O'Reilly	
200 km	OH 02041 PR	A	Sylvania	Olander Park 200 km T. H. Option	0	0.08	D Standish	D Standish
200 km	OH 02042 PR	A	Sylvania	Olander Park 200 km	0	0.07	D Standish	
150 km	OH 02043 PR	A	Sylvania	Olander Park 150 km T. H. Option	0	0.08	D Standish	D Standish
150 km	OH 02044 PR	A	Sylvania	Olander Park 150 km	0	0.5	D Standish	
15 km	OK 02012 BB	A	Tulsa	Tulsa Run 15 km 2002	1.33	13	G Lafarlette	
3 km	OK 02013 BB	A	Tulsa	Tulsa Run 3km	6.7	67	G Lafarlette	
5 km	OK 02014 BB	A	Tulsa	Tulsa Run 5km	4	40	G Lafarlette	
5 km	OK 02015 BB	A	Verdigris	Verdigris Jazz on the Lawn Run	0.1	0.8	G Lafarlette	
5 km	OK 02016 BB	A	Shawnee	OBU 5000 Meter Run	0	2.03	J Smith	
5 km	OK 02017 BB	A	Bartlesville miles	for Mammograms	0	2.01	G Lafarlette	
5 km	OK 02018 BB	A	Pawnee	Pawnee Warrior Challenge 5 km	0	0	J Smith	
12 km	OK 02019 BB	A	Pawnee	Pawnee Warrior Challenge 12 km	0	0	J	Smith
10 km	OK 02020 BB	A	Ponca City	Pioneer Woman Run	0	1	B Baumel	OK 83102 BB
2 km	OK 02021 BB	A	Ponca City	Pioneer Woman Run	0	5	B Baumel	OK 97007 BB
5 km	OK 02022 BB	A	Cushing	Run for the Mums	-0.6	2	D Garrett	OK 90031 BB
5 km	OK 02023 BB	A	Oklahoma City	Chili Day Run	0	1.6	J Smith	OK 99007 BB
10 km	OK 02024 BB	A	Oklahoma City	Chili Day Run	-0.2	1.45	J Smith	
5 km	PA 02011 WB	A	Altoona	Family Services of Blair Co. 5km	0	0	J Brady	
42.195 km	PA 02014 WB	A	Erie PResque Isle	Marathon Beach1	0	0	MVieyra	
5 km	PA 02015 WB	A	Philadelphia	PDR 5k - 2002	0	0	B Belleville	PA 99007 WB
5 km	PA 02016 WB	A	Lake Latonka	Lake Latonka 5km	0	0	M Courtney	
21.0975 km	PA 02017 WB	A	Harrisburg	Harrisburg Half Marathon	0	0.15	P Barner	
5 km	PA 02018 WB	A	Philadelphia	Wellness Ctr Road to Recovery-	0.36	9.1	B Belleville	
5 km	PA 02019 WB	A	Washington	Labor Day 5km	21	96.6	M Courtney	PA 89029 RE
5 km	RI 02006 RN	A	Kingston	URI Homecoming 5k	0.43	0.98	R Nelson	
5 km	RI 02007 RN	A	Providence	CVS/pharmacy Downtown 5k	0	0.16	R Nelson	RI 01008 RN
5 km	SC 02019 BS	A	Columbia	Bizarre Bazaar 5k	0	0	E PRytherch	SC 90035 BS
5 km	SC 02020 BS	A	Lake City	Healthy LC 5k	0	7	D White	
10 km	SC 02021 BS	A	Lake City	Healthy LC 10k	0	3.5	D White	
10 km	SC 02022 BS	A	Turbeville	Maranatha Fellowship Run	0	3.5	D White	
5 km	TN 02020 RH	A	Knoxville	Komen Race for the Cure 5k	0	0.61	A Morgan	
5 km	TN 02021 RH	A	Maryville	Scholars 5k Run	0	1.22	A Morgan	
5 km	TN 02022 RH	A	Memphis	Audubon Park 5k	0	0.06	R Hunter	
5 km	TN 02023 RH	A	Memphis	Special Kids 5k Bunny Run	0	0.06	R Hunter	
5 mi	TN 02024 RH	A	Johnson City	Citizen's Bank Race Your Own Way	-0.76	0.76	D Rogers	D Rogers
Cal	TN 02025 RH	A	Johnson City	Liberty Bell 1000 ft. Calibration	0	100	D Rogers	
5 km	TN 02026 RH	A	Chattanooga	Race for the Cure	3	11.89	D PReslsy	
10 mi	TN 02027 RH	A	Goodlettsville	Rivergate Ramble	0	0	J Zeigler	
Cal	TN 02028 RH	A	Goodlettsville	Moss Wright 1000 ft. Calibration	0	100	J Zeigler	
10 km	TX 02009 JF	A	Austin	Willie Nelson 10k	0	0	J Ferguson	TX 01010 JF
5 km	TX 02010 JF	A	Austin	Race Against Stigma 5k	0	0	J Ferguson	

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	DROP	SEP	MEASURER	REPLACES
5 km	TX 02011 JF	A	Austin	Teddy Bear 5k	0	2	J Ferguson	TX 01015 JF
10 km	TX 02012 JF	A	Austin	IBM Uptown Classic 10k	0	0.01	J Ferguson	
10 km	TX 02013 JF	A	Austin	IBM Uptown Classic 10k	0	1	J Ferguson	TX 02012 JF
5 km	TX 02014 JF	A	Salado	"Salado 5k Family Turkey Trot ""B"""	0	0	J Ferguson	Ferguson
5 km	TX 02015 JF	A	Salado	"Salado 5k Family Turkey Trot ""A"""	0	0.6	J Ferguson	J Ferguson
5 km	TX 02016 JF	A	Austin	Race for the Cure 5k	-1	20	J Ferguson	TX 01020 JF
10 mi	TX 02017 JF	A	Austin	AMY's Cattle Drive 10 Miler	0	2.5	J Ferguson	
5 km	TX 02059 ETM	A	Dallas	CCCD Relay 5k + Legs	-0.2	8	K Ashby	TX 99061 ETM
5 mi	TX 02059 ETM	A	Dallas	CCCD Relay 5k + Legs	0	0	K Ashby	TX 99061 ETM
21.0975 km	TX 02060 ETM	A	San Antonio	M.A.S.H Half Marathon	0	0	M Johnson	
1 km	TX 02061 ETM	A	San Antonio	NACACA20km Race Walk	0	0	M Johnson	
5 km	TX 02062 ETM	A	Sugar Land	Kempner Cross Country 5k	0	3	E McBrayer	
5 km	TX 02063 ETM	A	Chandler	Chandler 5k	0	1.8	T Cherry	
10 km	TX 02064 ETM	A	Conroe	Robyn's Race 4 Lou Gehrig's Disease 10k	0.2	1.9	R Barnhill	TX 99100 ETM
5 km	TX 02065 ETM	A	Pasadena	Focus on Family	0	2.6	E McBrayer	
5 km	TX 02066 ETM	A	Clute	Run for the Arts 5k	0	1.5	D Beaty	TX 01055 ETM
10 mi	TX 02067 ETM	A	Clute	Run for the Arts 10 Miler	0	0.5	D Beaty	TX 96079 ETM
5 km	TX 02068 ETM	A	Rhonesboro	Rhonesboro Possum Festival-0.2	0.2	6	K Vierzba	
10 km	TX 02069 ETM	A	Rhonesboro	Rhonesboro Possum Festival-0.1	0.1	4	K Vierzba	
5 km	TX 02070 ETM	A	Houston	Terry Fox 2002	0	1.6	E McBrayer	TX 01074 ETM
5 km	TX 02071 ETM	A	Houston	The Human Race 2002	0	2.2	E McBrayer	TX 01003 ETM
15 km	TX 02072 ETM	A	Fort Worth	Fort Worth Runners Club 15k	0	1	M Polansky	TX 01053 ETM
5 km	TX 02073 ETM	A	Fort Worth	Trinity 5000 Series	0	3.2	K Ashby	TX 97051 ETM
1 km	TX 02073 ETM	A	Fort Worth	Trinity 5000 Series	0	0	K Ashby	TX 97051 ETM
1 mi	TX 02073 ETM	A	Fort Worth	Trinity 5000 Series	0	0	K Ashby	TX 97051 ETM
4 mi	TX 02074 ETM	A	Grapeville	"F4M,Fellowship Church 4 Mile"	0	1.9	C Clines	
5 km	TX 02075 ETM	A	Dallas	AIDS Arm Lifewalk 5k	0.2	3.2	C Clines	
5 km	TX 02076 ETM	A	Fort Worth	Protectors of Freedom 5k	0	2.6	K Ashby	
5 km	TX 02077 ETM	A	Houston	Runway Race for Life 2002	0	6	R Barnhill	TX 01080 ETM
5 km	TX 02078 ETM	A	Irving	i2 Run for a Better World 5k	0	1	K Ashby	
4 mi	TX 02079 ETM	A	Grapevine	"F4M,Fellowship Church 4 Mile II"	0	0.5	C Clines	C Clines
5 km	TX 02080 ETM	A	Fort Worth	Candlelighter 5k	0	2	M Polansky	TX 01079 ETM
5 km	TX 02081 ETM	A	Dallas	Sister to Sister 5k	0	3.2	K Ashby	
5 km	TX 02082 ETM	A	Spring	Bearkat Bash	0	2.8	R Barnhill	
5 km	TX 02083 ETM	A	Houston	MPS 5k	0	4.5	E McBrayer	
20 km	TX 02084 ETM	A	Houston	Houston Championship & Relay	0	1.4	E McBrayer	TX 01082 ETM
5 km	TX 02085 ETM	A	Uvalde	St. Francis Fun Run	0	0	C Mericle	
10 km	TX 02086 ETM	A	San Marcos	Tanger 10 km	0	0	M Johnson	
5 km	TX 02087 ETM	A	Houston	Sylvan Rodriguez Downtown Dash	0	0.6	E McBrayer	TX 01084 ETM
5 km	TX 02088 ETM	A	Fort Worth	The Brief Run	0	1.6	C Clines	TX 00074 ETM
5 km	TX 02089 ETM	A	Dallas	M Streets 5k and Fun Run	0	0	C Clines	
5 km	TX 02090 ETM	A	Dallas	Jubilee Games	0	1.3	C Clines	
5 km	TX 02091 ETM	A	Southlake	Polka Trot	0	1.6	C Clines	
5 km	TX 02092 ETM	A	Irving	Pumpkin Dash 5k	0	0.5	M Polansky	
5 km	VA 02029 RT	A	Arlington	9-11 Memorial 5k	0	0.7	R Thurston	
5 km	VA 02033 RT	A	Newport	CNU 5k Fall Classic	0	1.5	S Bartram	
21.0975 km	VA 02034 RT	A	Fredericksburg	Blue Gray Half Marathon	1.5	23	V Culp	
21.0975 km	VA 02035 RT	A	Loudon County	Laws Run for the Shelter HMAR	0	0	R Thurston	
5 km	VA 02036 RT	A	Loudon County	Laws Run for the Shelter 5k	0	0	R Thurston	
21.0975 km	VA 02037 RT	A	Newport News	Mulberry Island Half Marathon	0	1	S Bartram	
5 km	VA 02038 RT	A	Saltville	Race Against Hunger 5k	0.2	4	D Rogers	
5 km	VT 02002 WN	A	Essex Junction	Father's Day Race	-0.122	0.77	B Lorenz	
5mi	VT 02003 WN	A	Burlington	GMAA Archie Post 5 Miler	-1.1	70	B Lorenz	
10 km	VT 02004 WN	A	Shelburne	GMAA Apple Harvest	0	0	B Lorenz	
5 km	VT 02005 WN	A	South Hero	GMAA Clarence DeMar	0.73	24.1	B Lorenz	
10 km	VT 02006 WN	A	South Hero	GMAA Clarence DeMar	0.37	12	B Lorenz	
Cal	WA 02004 BL	A	Richland	Port of Benton blvd. 1056 ft.	0	100	A Duanman	
Cal	WA 02005 BL	A	Steilacoom	Elwood Dr SW. 400 meter	0	100	T Cotner	

(Continued on Page 24)

Measurement of the Month

Hugh Jones

THE ROBIN HOOD MARATHON AND HALF MARATHON

NOTTINGHAM, UK

15 SEPTEMBER 2002

The second half of the course was changed completely from previous years, and there were several changes to the first half as well, both through Wollaton Park (no longer off-limits due to Foot & Mouth) and the city centre (from 1.5-3 miles).

I arrived at 18.00 and was met by Chris Sumner. Chris had already made measurements by calibrating his electronic odometer on the 500m steel-taped calibration course. His measurements turned out to be very accurate, and it seemed until almost the last minute that the course needed hardly any adjustment at all.

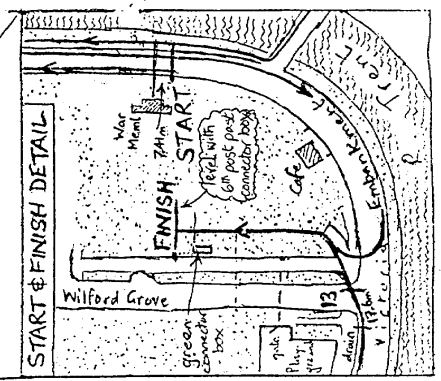
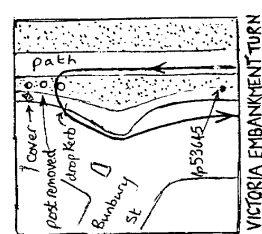
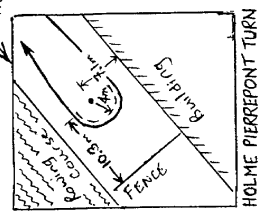
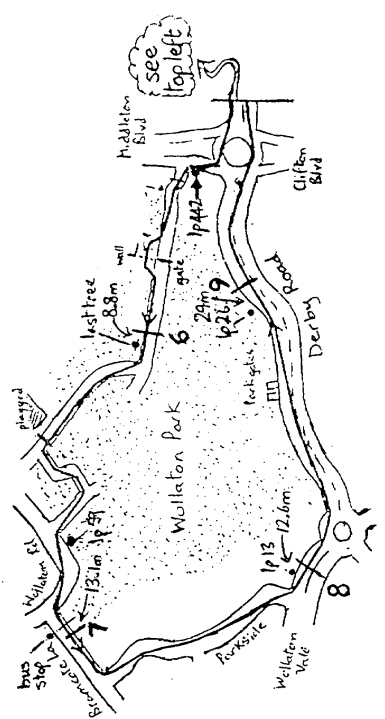
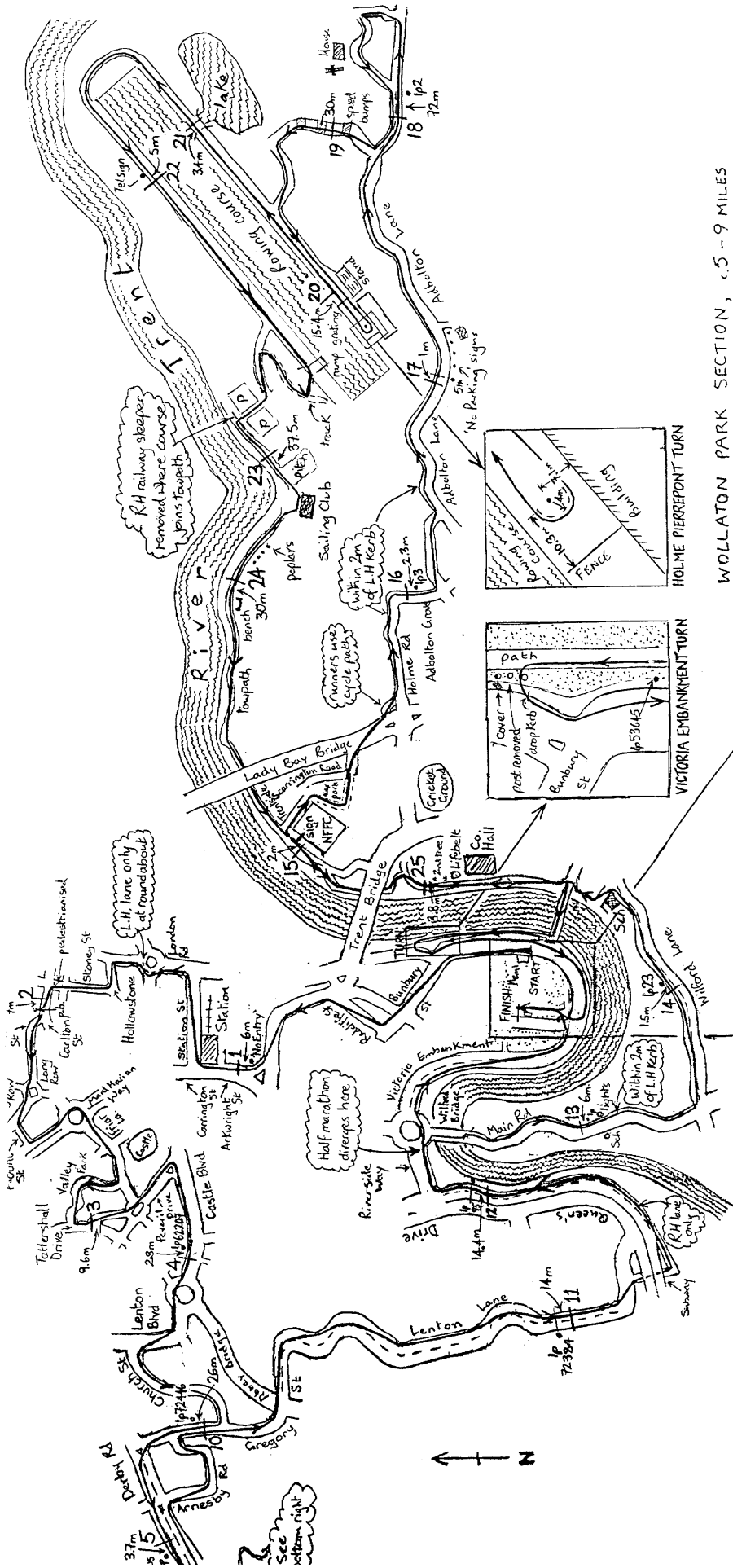
After calibrating we went directly to measure the section through Wollaton Park (8.5-10.8km) as this would be closed after 20.00. We then went to the finish line (unchanged since last year) and measured back along the half marathon course to a point before the full marathon course diverges (at 19.8km). We then rode further back along the (now common) course to 18.3km as this prevented us later riding against traffic on a busy road.

We assumed the Half Marathon course could be adjusted so that the correct distance would have elapsed at the fixed finish, and measured from where the marathon route diverged on this assumption. We then rode the course sequentially to the finish via two 180-degree turnaround points. The first of these was at the Holme Pierrepont national watersports centre, and used the facilities there, very close to the 20 mile split, to flash splits and pictures up on to the huge electronic scoreboard opposite the stand. This meant that the 20 mile split (after the turn) was fixed and the turn could not be used to adjust for course length.

At the second turnaround, with about 900m to go, I took references at the same point before and after the turn. The measurement at the finish line was about 63m short, so after recalibration we reconfigured the turnaround from 17m to 88m. This new turn route took advantage of a dropped kerb, but rendered the marathon route 10m overdistance. It was later decided not to adjust at the earlier (Holme Pierrepont) turn because of the technical arrangements there.

We then went to the point of emergence from Wollaton Park and measured to the 18.3km point. This then gave us a continuously measured route from the entrance to Wollaton Park at 8.5km to the finish line. We just had the final 8.5km to measure in reverse. All went well until 1.5 miles to go, when it became clear that the late changes in the city centre added much less distance than Chris had been told. Extending the start line back was not practicable, so after another recalibration we measured forward to determine what extra distance had to be found as early as possible on the course.

Chris suggested an extra loop at 3 miles. I measured this and found it would put the start very close to the War Memorial – an ideal location. We returned to the prospective start and I measured sequentially from there to the 4 mile reference along the new route. After a final calibration and later calculations this required moving the start back only 7.4m from the selected starting position, and left the split miles very close to the selected reference landmarks (see list below).



ROBIN HOOD MARATHON
NOTTINGHAM, UK

15 SEPT 2002

Measured by: Hugh Jones,

Not to scale

COURSE MEASUREMENT SUMMARY SHEET

EVENT ROBIN HOOD MARATHON AND HALF MARATHON

LOCATION: NOTTINGHAM, UK

DATE: 15 SEPT 2002

Promoting Organisation: BRASHER LEISURE LTD

Name & Address of race director Chris Sumner
4 St James Close
Pangbourne RG8 7AP

Tel: 0118 984 1021 / mobile 07733112276

Email: chrissumner@btinternet.com

Distance: not less than 42,195m / 21097.5m

Measured by:

Hugh Jones

Date:

2002-08-30

Measurement method: Jones counter mounted on bicycle wheel

Elevation, if not same, of: START 24m

FINISH 24m

Distance, in a straight line, between start & finish: c.250m

Description of the Course

- i) Terrain: Mainly flat, inclines in city centre at 1.5 – 3.5 miles
- ii) Race surface: Tarmac roads, section on towpath from 23-24.5 miles
- iii) Course configuration: Double 'butterfly' lap

Measurement Details

i) Section of road available: Entire width of road or carriageway if divided, except: half width only in Derby Road, Lenton Lane (10.2-11.2 miles) and Wilford Lane (13.2-14.5 miles), one RH lane of Queen's Drive (11.3-12 miles), within 2m of LH kerb on Holme Road, Adbolton Grove, Adbolton Lane to Holme Pierrepont Park entrance, and Victoria Embankment until 5m before Wilford Grove turn

ii) Line to be taken at turns: As indicated on course map: route follows paint markings in Nottm Forest FC car park after 15 miles and uses cycle lane at junction of Lady Bay Bridge/Holme Road. Turn into finish straight coned with 5m radius

SIGNED:

DATE: 2002-09-04

Abbreviations:

lp	lamp post
LHS	Left hand side
RHS	Right hand side
opp.	opposite
o/s	outside

List of split mile locations

START	Victoria Embkt, 7.41m south of centre of War Memorial
1 mile	6.1m past 'No Entry' sign RHS Arkwright St, before Meadows La
2 miles	7m before pillar box RHS Carlton St, just before pedestrianised Pelham St
3 miles	Tattershall Drive, 9.6m before far kerb of Holles Crescent
4 miles	2.8m after lp62207, RHS of Castle Blvd opp. Chippendale St
5 miles	3.7m before bus stop on Derby Road opp. Hillside (by Lodge)
6 miles	Wollaton Park, 8.8m before last tree on RHS of Lime Tree Ave
7 miles	13.1m past bus stop (RHS) opposite library on Bramcote Lane
8 miles	12.6m past lp13 on LHS of Wollaton Vale
9 miles	28.9m past lp26, LHS of Derby Road
10 miles	26.2m past lp72446, LHS of Gregory St
11 miles	14m past lp72384, RHS of Lenton Lane
12 miles	14.4m before lp95 (72919), RHS of Queen's Drive

Half Marathon only:

13 miles	17.6m past drain cover on LHS of Victoria embkt, just before Wilford Gro.
----------	---

Continuation of Marathon course:

13 miles (marathon)	5.9m before last lp before school warning lights (Main Rd)
14 miles	1.5m before lp23, LHS Wilford Lane
15 miles	1.9m before 'The Pitch' Diner sign (at NFFC)
16 miles	2.3m before lp3, LHS Adbolton Grove
17 miles	1m before 5th 'No Parking' sign on RHS Adbolton La before 'The Grange'
18 miles	72m before lp2 RHS Adbolton Lane (opp. Nurseries)
19 miles	29.9m before 2nd speed bump after turn into Holme Pierrepont
20 miles	15.4m past grating across road by stand (after U-turn)
21 miles	3.4m past near side of bridge over cut from rowing course to lake
22 miles	4.9m past emergency telephone sign
23 miles	37.5m before entrance to cricket field (marked on fence post)
24 miles	29.6m before bench (RHS) after line of poplar trees
25 miles	3.8m before 2nd tree (LHS) before lifebelt outside County Hall
26 miles	69.8m before paint mark on Victoria Embkt
FINISH	position on grass parallel with 6th post past green connector box.

reading	counts	distance	adj.distance	location
[c = 11.216955/m]		- 7.41m	0.00m	START – 7.41m south of position below:
40000	00000	0m	7.41m	Centre of war memorial
57900	17900	1595.80m	1603.20m	No entry sign RHS Arkwright St, before Meadows La
76100	36100	3218.34m	3225.75m	pillar box (RHS) before pedestrianised Pelham St
94181	54181	4830.27m	4837.68m	Tatershall Dr, level with far kerb of Holles Crescent
12093	72093	6427.14m	6434.55m	lp62207, RHS Castle Boulevard opp. Chippendale St
[c = 11.215204/m]				-----
23819	00000	0m	6434.55m	lp62207, RHS Castle Boulevard opp. Chippendale St
05695	18124	1616.02m	8050.57m	bus stop RHS Derby Rd, opp. Hillside (o/s Lodge)
98000	25819	2302.14m	8736.69m	lp442 LHS Middleton Blvd, just before turn into Park
[c = 11.2117/m]				-----
25000	00000	0m	8736.69m	lp442 LHS Middleton Blvd, just before turn into Park
35407	10407	928.22m	9664.91m	last tree on RHS of Lime Tree Ave
49045	24045	2144.63m	10881.32m	lp59 LHS Wollaton Rd, after exit from Park
[c = 11.215204/m]				-----
10000	00000	0m	10881.32m	lp59 LHS Wollaton Rd, after exit from Park
14160	4160	370.92m	11252.24m	Bramcote Lane, bus stop (RHS) opp. Library
32215	22215	1980.79m	12862.11m	Wollaton Vale, lp13 (LHS)
50082	40082	3573.89m	14455.21m	Derby Road, lp26 (LHS)
68161	58161	5185.90m	16067.22m	Gregory St, lp72446 (LHS)
86347	76347	6807.45m	17688.77m	Lenton Lane, lp72384 (RHS)
93846	83846	7476.10m	18357.42m	Lenton Lane, level with cycle sign towards subway
[c = 11.2117/m]				-----
03721	00000	0m	18357.42m	Lenton Lane, level with cycle sign towards subway
92920	10801	963.36m	19326.55m	lp95, RHS Queen's Drive
87072	16649	1484.96m	19842.38m	lp71891 Riverside Way (RHS)
HALF MARATHON FINISH SECTION:				
75171	28550	2546.44m	20903.86m	Victoria Embkt, drain cover before Wilford Gro, LHS
73000	30721	2740.08m	21097.50m	On grass level/w 6th post past green connector box, LHS
CONTINUATION OF MARATHON COURSE:				
Restarting at lp71891 (19834.97m), [c = 11.212951/m]				
20000	00000	0m	19842.38m	lp71891 Riverside Way (RHS)
32166	12166	1084.99m	20927.37m	lp(LHS) before School warning lights
50162	30162	2689.92m	22532.30m	lp23 LHS Wilford Lane
68223	48223	4300.65m	24142.03m	'The Pitch' Diner sign at NFFC
86210	66210	5904.77m	25747.15m	lp3, LHS Adbolton Grove
04291	84291	7517.28m	27359.66m	O sign RHS Adbolton Lane, 5th before Grange
23134	103134	9197.75m	29040.13m	lp2, RHS Adbolton Lane, opp. Nurseries
40708	120708	10765.05m	30607.43m	2nd speed bump after turn into Holme Pierrpont
58245	138245	12329.04m	32171.42m	grating across road before stand (after making U-turn)
76425	156425	13950.38m	33792.76m	near side of bridge (over cut from course to lake)
94454	174454	15558.25m	35400.63m	Emergency telephone sign (RHS)
06147	186147	16601.07m	36443.45m	near side of slipway opp. stand
06471	186471	16629.96m	36472.34m	join with unsurfaced path
12976	192976	17210.09m	37052.47m	edge of entrance to cricket field
30932	210932	18811.46m	38653.84m	bench (LHS) after end line of poplars (LHS)
48689	228689	20395.07m	40237.45m	2nd tree (LHS) before lifebelt, o/s County Hall
59973	239973	21401.41m	41243.79m	Victoria Embkt, lp53645 (opposite Bunbury St)
[c = 11.214203/m]				-----
07500	00000	0m	41243.79m	Victoria Embkt, lp53645 (opposite Bunbury St)
84987	987	88.01m	41331.80m	Victoria Embkt, lp53645 (opposite Bunbury St)
[c = 11.212951/m]				-----
60156	00000	0m	41331.80m	Victoria Embkt, lp53645 (opposite Bunbury St)
66670	6514	580.93m	41912.73m	Paint mark
69946	9790	873.09m	42204.89m	On grass level/w 6th post past green connector box, LHS

MARATHON FINISH POSITION –Using common start and finish lines with the half marathon, the marathon is 9.89m overdistance

CALIBRATIONS

On 500m steel-taped calibration course on Wilford Grove, footpath 2002-08-29

Pre-measurement, 18.35, 18C

start	end	reading
02000	07600	5600
07600	13201	5601
13201	18801	5600
18801	24401	5600

Average – 5600.25 (x 2, x 1.001)

Working constant = 11.2117/m

(used for kms 8.7-10.9 & 18.35-19.85)

Constant for the second half (avge) = 11.212951/m

Mid-measurement, 22.30, 14C

start	end	reading
72000	77603	5603
77603	83204	5601
83204	88804.5	5600.5
88804.5	94406	5601.5

Average – 5601.5 (x 2, x 1.001)

Mid-constant = 11.214203/m

(used for adjustment of turn at 41.3km)

Same venue, 2002-08-30

Post-measurement, 01.30, 12C

start	end	reading
96000	01602.5	5602.5
01602.5	07204.5	5602
07204.5	12807.5	5603
12807.5	18410	5602.5

Average – 5602.5 (x 2, x 1.001)

Finish constant = 11.216205/m,

Combine with mid-constant to get:

Constant for the first half (avge) = 11.215204/m

Post-adjustment, 03.10, 11C

start	end	reading
43000	48605	5605
48605	54207	5602
54207	59810	5603
59810	65413	5603

Average – 5603.25 (x 2, x 1.001)

Final constant = 11.217706/m

Combine with Finish constant to get

Constant for first 4 miles = 11.216955/m

Continued from Page 18)

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	DROP	SEP	MEASURER	REPLACES
Cal	WI 02063 JW	A	Waunakee	S. Division ST. 1000 ft.	0	100	M Hensgen	
10 mi	WI 02064 JW	A	Waunakee	Waunafest Run	0	1.12	M Hensgen	
Cal	WI 02068 JW	A	Belgium	Park Street 446.274 meter	0	100	S Kiskunas	
5 km	WI 02069 JW	A	Belgium	St. Mark Green Heart 5k	0	0	S Kiskunas	

Renewed

10 km	AL 90018 JD	A02	Cullman	Cullman Heart Run	-0.6	1.7	R Roland	
Cal	NC 88005 ACL	A02	Winston-Salem	Country Club Rd. 2640.194 ft.	0	100	K Jackson	
Cal	NJ 85026 GD	A02	Trenton	Halmilton Ave 2640 ft.	0	100	J Beiger	
5 mi	NY 89014 AM	A02	Ithaca	Ithaca 5 Mile	0	1.2	E Smith	
10 mi	NY 89015 AM	A02	Ithaca	Ithaca 5 Mile	0	0.62	E Smith	
5 km	NY 90009 AM	A02	Mendon	Nestle Crunch 5k Challenge	0	0	G Tillson	
Cal	NY 91007 WN	A02	Syracuse	Lancaster Ave. 1000 ft. Cal.	0	100	WNicoll	
10 km	NY 91039 AM	A02	N. Greece	Race With Grace 10k	0.4	2.7	G Tillson	
5 km	OK 89029 BB	A02	DRumright	Oil Patch Run 5 km	0.4	2.5	G Lafarlette	
8 km	OK 90010 BB	A02	Hugo	Goodland Challenge 8 km Run-0.04	0.35	0.35	G Lafarlette	
5 km	OK 91024 BB	A02	Wagoner	Wagoner Summerfest 5 km	0	1.75	G Lafarlette	
5 km	OK 92052 BB	A02	Tulsa	MDA Night Light #2	0	1.5	G Lafarlette	
1 mi	PA 88043 RE	A02	Harrisburg	The Harrisburg Mile	0.947	100	P Barner	
42.195 km	VT 88001 BT	A02	South Hero	Green Mountain Marathon	0.144	0.73	B Cunningham	

Copies of these certificates available from:

Karen Wickiser - Course Registrar
 2939 Vincent Road
 Silver Lake, OH 44224-2916
 Phone 330-929-1605
 FAX 509-351-5383
 mikewickiser@neo.rr.com

(Send course name & ID number and \$3.00)
 Each certificate includes a course map.
 A complete listing of USATF Certified courses is available at:
www.RRTC.net

PUBLICATIONS AVAILABLE FROM RRTC

Printed Course Lists - You can obtain a list of certified courses for any state. Send \$2.00 for any state list. You will receive a list that is current as of the last published Measurement News. If you wish the courses to be sorted in a special way, let us know. Otherwise it will be sorted by distance as the list appears in MN. You can obtain other specially-sorted lists - for instance, you might want to have all the 5k's in IL, IN, and MO. It can be done. Just say what you want. If you are online, lists can be sent that way. Contact Mike Wickiser at MikeWickiser@neo.rr.com

Attention RRTC certifiers: Your lists are free. Any time you want one let us know. You can mark up any mistakes and we will correct it and send you a new copy.

Web Page Access to Course Lists: The complete list can be downloaded from the RRTC website at www.rrtc.net/download/ Also, try the certified course Search Engine at the USA-LDR website www.usaldr.org

Individual Certificates - These may be obtained by sending the course number and \$2.00 per course desired. **SEND THE COMPLETE ID, INCLUDING PREFIX AND SUFFIX LETTERS.** Thus: CA92057 RS. Send course name, length and location as well. If you are thinking of hiring a measurer, this is an excellent way to see the sort of work you can expect. In addition, you may wish to check out a course you intend to run. Bring the map to the course and see if the race director got it right!

Above material may be obtained from: Mike Wickiser - 2939 Vincent Rd. - Silver Lake, OH 44224-2906

Measurement Calculation Computer Program by Bob Baumel, version 1.2 for Macintosh or IBM PC. This software can be downloaded for free from the RRTC website at www.rrtc.net/download/ or Bob will distribute it by email attachment (send requests to webmaster@rrtc.net) or on floppy disks (send blank, formatted diskette and stamped return mailer to Bob at: 129 Warwick Road, Ponca City OK 74601-7424). Be sure to specify Mac or PC version.

Electronic Certificate Templates (available to Certifiers only), now in an Adobe Acrobat format which isn't tied to any word processor. Requires Acrobat or Acrobat Reader 4.0 or greater (Current Acrobat Reader may be downloaded for free from www.adobe.com). The template allows you to fill in certificates on the computer and print them. Available in both FS and non-FS version. Distributed by Bob Baumel by email or diskette [same addresses as for Measurement software]. Bob can customize the template with certifier's personal info at the bottom (name, address, phone, etc.) so you can avoid re-typing it every time (Be sure to specify exact ID text desired when requesting a template). **Online course measurement book**, edited by Bob Baumel. It's a revision of the one you can buy from USATF, but the basic procedures have not changed. Available at: www.rrtc.net

Course Measurement Procedures - the Bible of course measurement. Complete instructions for measuring courses for USATF certification. The same procedures are now used for IAAF and AIMS courses. \$9.00 postpaid. Available from: USATF - Book Order Dept. - PO Box 120 Indianapolis, IN 46206

Course Measurement Video - a concise 17 minute introduction to course measurement, intended as a supplement to Course Measurement Procedures. See how it's done! Version 2 sells for

\$10 but there are still a few copies of the original version available for \$7.50. Send to: Tom McBrayer - 4021 Montrose - Houston, TX 77006-4956.

OTHER PUBLICATIONS AND EQUIPMENT

Road Race Management is a monthly newsletter providing race organizing ideas and news for race directors. \$97 per year from: Road Race Management - 4904 Glen Cove Pkwy - Bethesda, MD 20816 Phone: 301-320-6865 Fax: 301-320-9164

Jones/Oerth Counters - Write to: Paul Oerth - 2455 Union St - Apt 412 - San Francisco, CA94123. Phone: 415-346-4165 Fax 415 346 0621. Email: Poerth@aol.com. US Price is \$70 for the 5 digit model, \$80 for the 6 digit model, postpaid. Foreign price is \$75/\$85 plus postage. Foreign orders shipped by airmail. Visa, MasterCard, American Express cards accepted. Note: Payment in advance is required.

RunScore - The flagship of IBM-style finish line programs. For information contact: Alan Jones - 3717 Wildwood Dr - Endwell, NY 13760. Or check it out on the internet at: www.runscore.com

Apple Raceberry JaM - Race management software for Macintosh and Windows. Check it out on the Internet at www.raceberryjam.com or call Jack Moran at (952) 920-0558.

TOPOGRAPHIC MAPS

USAtopographic maps are available from:

U. S. Geological Survey 303-202-4200
USGS Map Sales
PO Box 25286, Bldg 810
Denver Federal Center
Denver, CO 80225

Delivery will be made in approximately 4 weeks. Ask for latest price.

Maps can be located and ordered online at: www.usgs.gov

Maps can be obtained in just a few days from:

Map Express - PO Box 280445 - Lakewood, CO 80228-0445

1-800-MAP-00EX (1-800-627-0039)

Maps can be located and ordered online at: www.mapexp.com

Topo Maps on CD-ROM - 3-D TopoQuads includes authentic USGS 7.5-minute quadrangle maps, assembled into one seamless database

See an interactive online demo at www.delorme.com

Also - check out Street Atlas USA from the above - it's a seamless street map of the whole USA at a decent price.

USGS TOPOGRAPHIC MAPS ONLINE - FREE

Maps.Com has a section where you can click on to all USGS maps, free. This can be very handy for obtaining accurate elevation information.

Check out: www.maps.com

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CERTIFIERS - Please check this listing to be sure we have your data correct.

October 29, 2002