

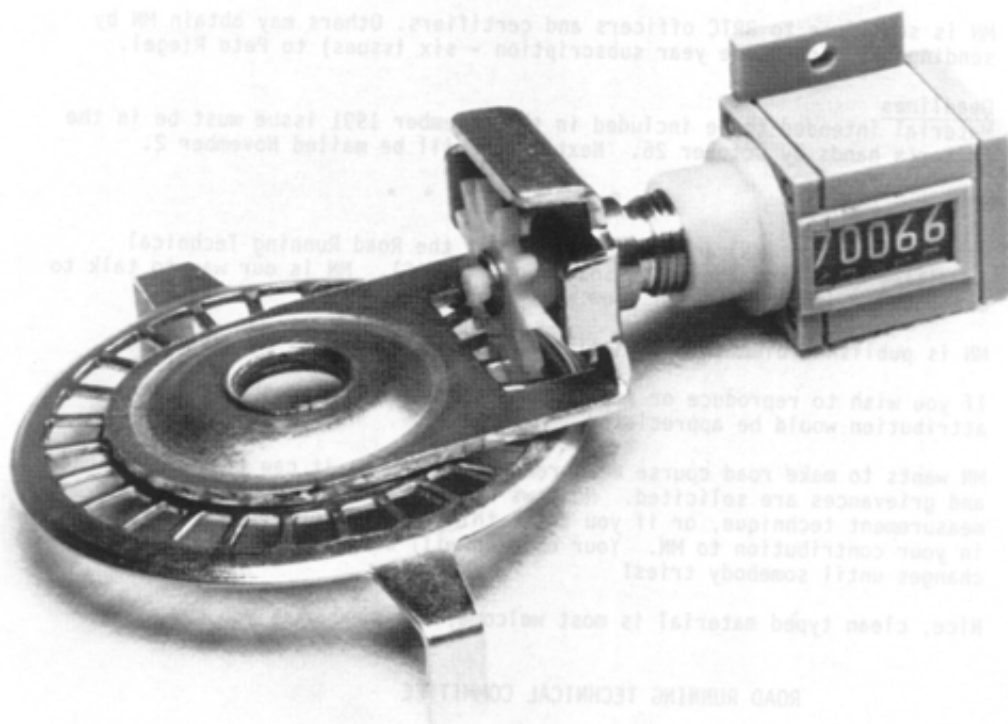
MEASUREMENT NEWS



September

1991

Issue #49



NEW COUNTER WILL SOON BE AVAILABLE

Paul Oerth has contacted a supplier of drive gears, and is in the process of ordering material and tooling up for production of a new counter for use in course measurement.

The new counter is mechanically similar to the Jones Counter, but uses a rigid coupling between the counter and the gear drive. This provides superior alignment, and eliminates the twisted wires so familiar to course measurers.

Pricing and ordering details for the Oerth Counter (or whatever he will choose to call it) are unknown at this time, but Paul hopes to be in production by the end of the year. Details will appear in future issues of MN.

MEASUREMENT NEWS

#49 - September 1991

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NEW APPOINTMENTS

Two new Final Signatories have been appointed by Wayne Nicoll. Both have served the necessary apprenticeship, and have demonstrated the needed competence at both measuring on their own, and reviewing the work of others. Elizabeth Longton is now National Road Course Certifier for Tennessee, and Bob Harrison for Mississippi. Since their initial recruitment we have seen growth in quality and quantity in both states. Welcome, Elizabeth and Bob.

* * * * *

Entire Printed Course List - This list includes every currently certified course in every state. It will be about 180 pages this year. It will be published in November, in time for the TAC Convention. If you want a copy, send \$20 to Joan Riegel before November 10. One will be sent to you by first class mail.

Note: If you have a computer, you can have the whole list free, any time, if you send us a disk and a stamped return mailer. It will come as an ASCII file.

TADEUSZ DZIEKONSKI SENT TO SIBERIA

At AIMS request, Poland's Tadeusz Dziekonski traveled to Omsk in the Soviet Union, east of the Urals, and measured the course of the Siberian Marathon. He used a Capair solid tire, and liked it. The course was a nightmare to measure - cones and restrictions everywhere. You'll see his report and map in this issue. Besides the overall map, Tadeusz also prepared numerous sketches of all intersections, showing the extensive coning.

WIND MEASUREMENT

The deliberations of the Tampa Committee which reviewed TAC Rule 185.5 may lead to an overhaul of the rule, especially in the area of wind aid.

At the TAC Convention, it is likely that RRTC will be invited to present its opinion on some aspect of wind measurement. In order to do this effectively, we need to know the individual views of as many people as possible. It's not very representative to simply poll those people who happen to attend the RRTC meeting at the TAC Convention, although it's all we can do if we don't know what people think beforehand.

In TacTimes, July/August 1991, there appeared "Update and Commentary - 'Record Standard' Courses: TAC Rule 185.5." Read it and send Pete Riegel any opinions you may have that relate to technical things we might be involved in. If you do, your "vote" will count. If you do not, you go unheard.

To ASSIST WITH
PRECISE MEASUREMENT OF TIME

CALENDAR.....1753-2059

TO USE - OBTAIN YEAR TYPE LETTER FROM OTHER SIDE -
THEN FIND MONTH,
GO STRAIGHT ACROSS TO YEAR TYPE LETTER,
THEN DOWN TO CALENDAR.

JAN. 310	E L G N O K A H G J B I F M 310 JAN.
FEB. 2829	B I D K A H E L G N F M G J 2829 FEB.
MAR. 310	B H D J A N E K B H D J C I G M 310 MAR.
APR. 300	F L A N E K B H D J C I G M 300 APR.
MAY 310	D J F L G I G M B H A N E K 310 MAY
JUNE 300	A N C I G M D J F L E K B H 300 JUNE
JULY 310	F L A N E K B H D J C I G M 310 JULY
AUG. 310	G I E K B H F L A N G M D J 310 AUG.
SEP. 300	G M B H F L G I E K D J A N 300 SEP.
OCT. 310	E K G M D J A N C I B H F L 310 OCT.
NOV. 300	B H D J A N E K G M F L G I 300 NOV.
DEC. 310	G M B H F L C I E K D J A N 310 DEC.

S M Tu W Th F S	1 2 3 4 5 6 7
	8 9 10 11 12 13 14
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	22 23 24 25 26 27 28
	29 30 31

S M Tu W Th F S	1 2 3 4 5 6
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	14 15 16 17 18 19 20
	21 22 23 24 25 26 27
	28 29 30 31

S M Tu W Th F S	1 2 3 4 5
	6 7 8 9 10 11 12
	13 14 15 16 17 18 19
	20 21 22 23 24 25 26
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S M Tu W Th F S	1 2
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S M Tu W Th F S	1 2 3 4
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EXAMPLE:
JULY 4, 1776
YEAR TYPE: H
DAY OF WK: THURSDAY

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

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PERPETUAL CALENDAR - BOOKMARK

- CALENDAR
1753 - 2059

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To use: Start on this side:
Find first three digits of year in top row,
Drop down to line of fourth digit,
And obtain Year Type Letter.
Remember this letter --- and turn over -

205	O	F	K	C	H	G	L	D	I	A	M	E	J	B	N	F	O
204	I	G	F	D	C	A	G	E	F	D	B	A	F	E	C	B	G
203	2	H	G	L	D	I	A	M	E	J	B	N	F	K	C	H	
202	3	C	A	G	E	D	B	A	F	E	C	B	G	F	D	C	
201	4	D	I	A	M	E	J	B	N	F	K	C	H	G	L	D	
200	5	E	D	B	A	F	E	C	B	G	F	D	C	A	G	E	
199	6	M	E	J	B	N	F	K	C	H	G	L	D	I	A	M	
198	7	A	F	E	C	B	G	F	D	C	A	G	E	D	B	A	
197	8	B	N	F	K	C	H	G	L	D	I	A	M	E	J	B	
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188	2	H	G	L	D	I	A	M	E	J	B	N	F	K	C	H	
187	3	C	A	G	E	D	B	A	F	E	C	B	G	F	D	C	
186	4	D	I	A	M	E	J	B	N	F	K	C	H	G	L	D	
185	5	E	D	B	A	F	E	C	B	G	F	D	C	A	G	E	
184	6	M	E	J	B	N	F	K	C	H	G	L	D	I	A	M	
183	7	A	F	E	C	B	G	F	D	C	A	G	E	D	B	A	
182	8	B	N	F	K	C	H	G	L	D	I	A	M	E	J	B	
181	9	C	B	G	F	D	C	A	G	E	D	B	A	F	E	C	
180																	
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176																	
175																	

Paul Oerth
2455 Union St #412
San Francisco, CA 94123

Allan Steinfeld

8-6-91

New York Road Runners Club

Dear Allan,

I'm sure you remember me. I use to work a great deal with Len Wallach. I don't any more. I met you several times when you came to San Francisco usually for the Bay to Breakers race.

I went to the RRCA Convention in Kansas City this year. Alan Jones was there, and so was Pete Reigel. I've been working with Alan Jones in connection with his RUN TIME SOFTWARE program. While in KC he mentioned his 'JONES COUNTER' and the fact that the New York Road Runner's Club was now making and distributing them. He said if I wanted to make them I could do so (with his blessing - (my words)). Pete Reigel expressed similar thoughts. Basically they both want to be certain that 'JONES' counters, or something similar will always be available. They both encouraged me to go into production. I've considered it carefully and decided to do so. So, the 'OERTH' counter will very likely become a reality.

Alan Jones suggested I contact you to let you know this was my intention. I would have done so in any case.

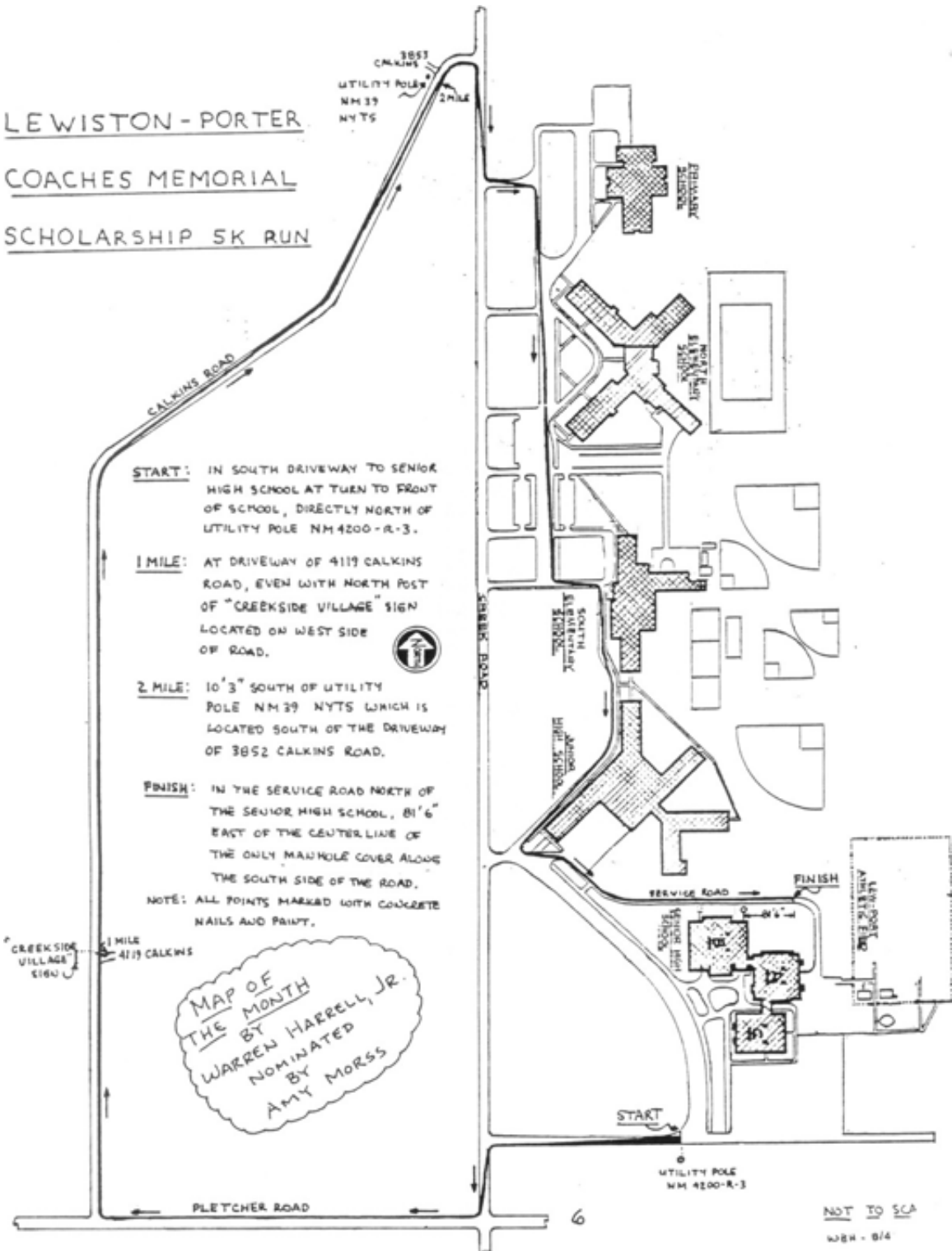
I am not doing this as a grand money making scheme. This is probably the smallest market in the world. I am approaching this with the idea that there will always be available a 'JONES COUNTER' type device for measuring race courses.

Best Regards,

Paul Oerth
Paul Oerth

cc: Alan Jones
Pete Riegel
Karl Oerth
Stephen Oerth

LEWISTON - PORTER
COACHES MEMORIAL
SCHOLARSHIP 5K RUN



START: IN SOUTH DRIVEWAY TO SENIOR HIGH SCHOOL AT TURN TO FRONT OF SCHOOL, DIRECTLY NORTH OF UTILITY POLE NM 4200-R-3.

1 MILE: AT DRIVEWAY OF 4119 CALKINS ROAD, EVEN WITH NORTH POST OF "CREEKSIDE VILLAGE" SIGN LOCATED ON WEST SIDE OF ROAD.

2 MILE: 10' 3" SOUTH OF UTILITY POLE NM 29 NYTS WHICH IS LOCATED SOUTH OF THE DRIVEWAY OF 3852 CALKINS ROAD.

FINISH: IN THE SERVICE ROAD NORTH OF THE SENIOR HIGH SCHOOL, 81' 6" EAST OF THE CENTERLINE OF THE ONLY MANHOLE COVER ALONG THE SOUTH SIDE OF THE ROAD.

NOTE: ALL POINTS MARKED WITH CONCRETE NAILS AND PAINT.

MAP OF THE MONTH
 BY WARREN HARRELL, JR.
 NOMINATED BY AMY MORSS

NOT TO SCALE
 WBH - 8/4

THE ATHLETICS CONGRESS
OF THE USA

3354 Kirkham Road
Columbus, OH 43221

Road Running Technical Committee
Peter S. Riegel, Chairman

614-451-5617 (home)
614-424-4009 (office)
FAX 614-424-5263

August 8, 1991

To: Bob Baumel, Jeff Darman, Charles DesJardins, Julia Emmons, Basil Honikman, Kim Jones, Don Kardong, Jack Moran

Subject: 185.5 modifications

I am aware that I am not a member of your committee, and that you are not obliged to pay any attention to my ravings. However, as much as you, I would like to have a relatively tranquil convention, and put this business to bed.

If a specific text for 185.5 can be arrived at before the convention, and accepted by all committee members, we can go in the knowledge that we stand united, and not fritter away valuable convention time as we have done during the last several years.

I propose the following:

* * * * *

RULE 185.5

For all road records:

(a) The course must not have a decrease in elevation from start to finish exceeding 1 part per thousand (i.e. 1 m per kilometer).

(b) The start and finish of the race must lie ~~closer~~ (no more) than 30% of the race distance apart, as measured along the straight line between them. ~~except that when it can be shown that the average component of the wind direction for the duration of the race did not to any extent whatsoever constitute a tailwind. The method for determining the wind direction shall be as specified by the Road Running Technical Committee.~~

* * * * *

The Road Running Technical Committee will support the above modification. It's a rule that leaves everybody knowing where they stand.

We also support the idea of "bests" to create a list of marks set under non-standard conditions, and will help with technical assistance, if it is desired.

Both slope and wind aid must be minimized if records are to have meaning, and the above limits on course configuration do this, as well as including a whopping 90 percent of all road courses.

Seven percent of courses are too downhill for record consideration. This is generally recognized and accepted.

The remaining three percent (flat, but widely separated) are excluded from records by the above proposed rule. If the wind gauging provision is retained, the three percent can be included. However, this attempt to be inclusive is likely to bring a year-after-year storm of complaint:

- 1) Since the wind is almost always blowing from some direction on race day, about half the races will have tailwinds. These will produce faster times, which will then be shot down because of tailwind aid.
- 2) Race directors will either have to arrange for wind-gauging, or to explain to angry fast runners why they did not.
- 3) At the start, nobody (runners, fans, race director, media) will know whether a record time will be recognized. Also, the information may not be available for weeks or months, depending on the wind data received from the race organization.

If you feel that you can live with the hassle that wind-gauging will cause, so can we in RRTC. Nobody in RRTC likes it, to my knowledge. We are not happy with the methods thus far proposed. They will work, but are complicated. Most of us don't think the sport is improved by offering wind-gauging. It is intended as an extra benefit so that courses like New York City Marathon, Grandma's Marathon and Crescent City 10k can have legitimate records recognized. However, I don't think it will be seen that way. Instead, it will be seen as a heavy-handed TAC imposition of technical mumbo-jumbo on race directors and athletes. Who needs this aggravation?

Please do not seriously consider removing the separation limit. Unexamined, it seems attractive, since it allows an easy way to let in the three percent, without wind-gauging. Thus it seems to let more people play. However, its adoption will lead to acceptance of fast times set under ridiculously aided conditions, which will be nearly impossible to beat under normal conditions. The Beamon long jump is a good example of the sort of mark we will see if we ignore wind. Many on the track side (including Track & Field News) believe that jumps and sprints at high altitude should not be considered as records.

Records are more fun if they get broken once in a while. The long jump people haven't had something to clap about in decades, because their standard was too loose. Carl Lewis is the best long jumper ever, but he never held the record. He's come close, but never had a chance - how many track meets are held at 7000 feet? If the door is opened for wind-aided road records, we will see the same thing. Impossible marks that can't be beaten on any normal course.

The overwhelming majority of the sport is well-served by present limits on course configuration. Please don't consider any action that will damage that 90 percent.

Best regards,



Post-it™ brand fax transmittal memo 7671		# of pages > 1
To	PETE RIEGEL	
From	NORM GREEN	
Co.	TAC NRTC	
Co.	TAC MASTERS LDR	
Dept.		
Phone #	215 768 2480	
Fax #	614 424 5263	
Fax #	215 768 2470	

405 Curtis Court
Wayne, PA 19087
August 11, 1991

Peter S. Riegel
Road Running Technical Committee
The Athletics Congress
3354 Kirkham Road
Columbus, OH 43221

To: FAX 614-424-5263
From: FAX 215-768-2470

Dear Pete:

I am now in receipt of three communications from you concerning TAC Rule 185.5. You have graciously provided me copies of your July 26 letter to the ad hoc committee and your proposed modification of Rule 185.5 as presented in your August 8 letter.

I can keep this response reasonably brief by saying forthrightly that I am in complete agreement with your rule revision. I find your arguments persuasive and your logic impeccable.

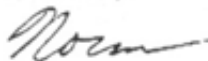
The integrity of TAC records is at stake in the further debate about this rule. The aid to runners of either slope or tail-wind should be denied by our rule. What you propose will very nicely set the limits so that times achieved by any runner result from an unaided effort on any of the 90% of courses meeting our standard.

Any other effort aided by slope or tail-wind that betters a standard course record will excite the media and be listed for comparison purposes as a "beat." As you, I can support this decision of the ad hoc committee.

I believe you have given us a very helpful revision and support of the committee's basic decision (minus the wind factor) which will allow TAC to remain within the guidelines for world road records about to be achieved through IAAF. As one who has been working dilligently in the World Association of Veteran Athletes to ensure that WAVA road courses have AIM certified measurements and that such courses meet the revision of Rule 185.5 standard that you have proposed, I am now anxious that TAC support that standard.

Be assured that I will be lobbying my friend, Charles DesJardins, on this matter and communicating with others in Masters Long Distance Running in support of your revision.

Sincerely,

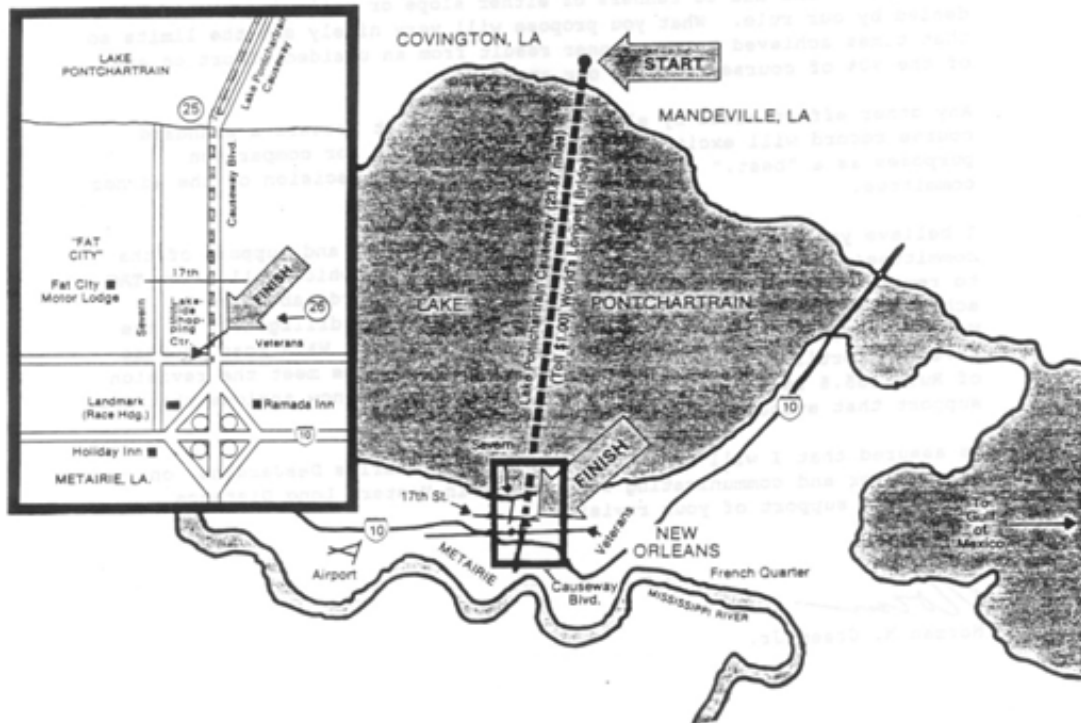


Norman M. Green Jr.



GONE BUT NOT FORGOTTEN

We usually mention the Mardi Gras Marathon course when we wish to point out how wind can produce some wild times. My memory serves me badly, but I recall that one year they had a strong tailwind, and a whole flock of people became "surprise!" qualifiers for the Olympic Trials, on the strengths of Mardi Gras times that were PR's by 5 to 8 minutes. I talked with one person who told me a story of a runner who was actually blown off the bridge, and was hauled from the water by a fisherman. The race never had substantial prize money nor a stellar field.



THIS MONTH'S PUZZLE

This puzzle is taken from an examination given to French measurers by Jean-Francois Delasalle. You are an IAAF measurer, and are to lay out a certified 20 km course on a small loop, just under 5 km around. The start is fixed. The race director also wants accurate split points established for 1, 5, 10, and 15 km.

You may make only two circuits of the loop while measuring.

You get this data:

Precalibration constant = 9663 counts per kilometer including 1.001.
One ride of loop (only one is required by IAAF) yields 46300 counts.
Postcalibration constant = 9669 counts per kilometer including 1.001.

Remember, IAAF measurements use average constant.

Questions:

- 1) With the loop ridden, but postcalibration not yet done, you must lay out all the splits, without making multiple circuits of the course. All the splits will be laid out on the second circuit of the course. You start riding at the start line at a count of 47000, riding in the running direction. What will your count be at 1, 5, 10, 15, and 20 km?
- 2) After recalibration, do you have any further adjustments to make?

LAST MONTH'S PUZZLE

The puzzle involved a straightforward layout of a 5 km course. I have received measurements that were not too different from the puzzle.

Condition 1: The race director wants to have certified distances of 1, 2, 3, 4 and 5 km, from the start.

Condition 2: He may also want each individual km to be certified.

The course was to be the shortest allowable, staying within strict TAC rules.

Questions for the experts:

- 1) To comply with Condition 1, how far must the 4 km split point be moved, and in what direction?
- 2) To comply with Condition 2, how far must the 4 km point split be moved, and in what direction?

Answers

Procedures to use for this puzzle:

- a) Use average constant rather than larger constant. This is not encouraged, but is permitted. It gives a slightly shorter course on layouts.

- b) Use the shorter measurement as official.
- c) Measurements must agree within 0.08 percent to be certifiable.

Refer to the summary of data and calculations:

1) For condition (1) to be met, the measurements of each split point from the start must agree within 0.08 percent, or 0.8 m in each kilometer. As can be seen from "CUMULATIVE DISTANCES FROM START" only kilometers 3, 4 and 5 meet the criterion. The measurer will have to remeasure kilometers 1 and 2 to get better agreement if he wishes to have them certified.

The 4 km split would have to be moved 1.7 m away from START to be certifiable. Note: if larger constant is used, 2.8 m needs to be added.

2) For condition (2) to be met, the measurements of each split from the next split must agree within 0.8 m. Only the 4-5 km segment is certifiable, and the 4 km point would need to be moved 1.7 m (2.8 using larger constant) away from the start, as well as moving the FINISH 2.2 m (3.6 using larger constant) from the start (required for overall certification of the course).

Good overall agreement can be had even though the intermediate splits may not agree very well. In many cases the errors go both ways, and compensate for one another. However, this can leave a course on the short side. For this reason Bob Baumel coined the phrase "sum of shorter splits." It's a useful tool when you see good overall agreement with bad individual split agreement. In the case of this course I might ask them to add 6.4 meters to the course, instead of the bare minimum of 2.2. Intermediate riding on this course was pretty erratic.

Tip on puzzles like this: "Rounding up" your calibration constant is the safe thing to do when laying out a course, but it's also a sure way to produce small but significant errors in puzzles that seek minimum values.

Responding to this puzzle were Bernie Conway, Tadeusz Dziekonski, Michael Franke, Bill Glauz, Bill Grass, Bob Harrison, Paul Hronjak, Brian Smith and Mike Wickiser.

The two Bills were the only ones to detect every single pitfall. Because Grass noticed that average constant would yield a slightly shorter layout, he is declared the winner. He warned the race director that playing with the rules was a two-edged sword, and that such shenanigans could result in a course that might not survive validation.

Bob Baumel sent in his article Updates to Measurement Computer Program just before MN went to press. He used the puzzle for a calculation example, but, being the Father of the Larger Constant, did not use the average in his example. That was probably a good idea, since the larger is better unless validating or solving puzzles.

SUMMARY OF DATA AND CALCULATIONS

TAPED 500, 499.98 METERS ON ROADWAY, TEMPERATURE 12C
 AVG MEASUREMENT = 499.99
 CORRECTION FACTOR = 0.999907
 CORRECTED LENGTH = 499.9436 METERS

CALCULATIONS ARE BASED ON AVERAGE CONSTANT, INCLUDING 1.001 EXTRA

PRECAL		POSTCAL		
4896 4895.75 AVG		4899 4898.5 AVG	CONSTANT FOR DAY:	
4896 9802.397 CT/KM		4899 9807.903 CT/KM	9.80515 COUNTS PER METER	
4896 9.802397 CT/M		4898 9.807903 CT/M		
4895		4898		

	<u>FIRST RIDE</u>			<u>SECOND RIDE</u>			
	<u>RECORDED</u>	<u>INTERVAL</u>	<u>INTERVAL</u>	<u>RECORDED</u>	<u>INTERVAL</u>	<u>INTERVAL</u>	<u>SHORTER</u>
	<u>COUNT</u>	<u>COUNT</u>	<u>METERS</u>	<u>COUNT</u>	<u>COUNT</u>	<u>METERS</u>	<u>SPLIT</u>
START	61900			60004			
1 KM	71702	9802	999.6787	50186	9818	1001.311	999.6787
2 KM	81504	9802	999.6787	40373	9813	1000.801	999.6787
3 KM	91306	9802	999.6787	30582	9791	998.5569	998.5569
4 KM	101108	9802	999.6787	20800	9782	997.639	997.639
FINISH	110910	9802	999.6787	11000	9800	999.4747	999.4747
TOTAL			4998.394			4997.782	4995.028

CUMULATIVE DISTANCES FROM START

	<u>FIRST</u>	<u>SECOND</u>	<u>DIFFER-</u>	<u>ALLOW-</u>	<u>TOTAL</u>
	<u>RIDE</u>	<u>RIDE</u>	<u>ENCE, M</u>	<u>ABLE</u>	<u>SPLIT</u>
	<u>0</u>	<u>0</u>	<u>0</u>	<u>DIFFER-</u>	<u>CERTI-</u>
	<u>0</u>	<u>0</u>	<u>0</u>	<u>ENCE, M</u>	<u>FIABLE ?</u>
START	0	0	0		
1 KM	999.68	1001.31	1.63	0.8	NO
2 KM	1999.36	2002.11	2.75	1.6	NO
3 KM	2999.04	3000.67	1.63	2.4	YES
4 KM	3998.71	3998.31	0.41	3.2	YES
FINISH	4998.39	4997.78	0.61	4	YES

COMPARISON OF INDIVIDUAL INTERVALS

	<u>FIRST</u>	<u>SECOND</u>		<u>ALLOW-</u>	<u>INDIVIDUAL</u>
	<u>RIDE</u>	<u>RIDE</u>		<u>ABLE</u>	<u>INTERVAL</u>
	<u>INTERVAL</u>	<u>INTERVAL</u>	<u>DIFFER-</u>	<u>DIFFER-</u>	<u>CERTI-</u>
	<u>METERS</u>	<u>METERS</u>	<u>ENCE, M</u>	<u>ENCE, M</u>	<u>FIABLE ?</u>
0-1 KM	999.68	1001.31	1.63	0.8	NO
1-2 KM	999.68	1000.80	1.12	0.8	NO
2-3 KM	999.68	998.56	1.12	0.8	NO
3-4 KM	999.68	997.64	2.04	0.8	NO
4-5 KM	999.68	999.47	0.20	0.8	YES

If we had good agreement (0.08%) on each individual segment, the following chart would apply to all adjustments, based on Sum of Shorter Splits (SOSS):

START TO	SHORTER TOTAL	DISTANCE TO ADD IF EACH SPLIT IS TO BE CERTIFIED	SOSS TOTAL	DISTANCE TO ADD IF EVERY KM INTERVAL IS TO BE CERTIFIED	(Based on average constant)
1 KM	999.68	0.32	999.68	0.32	
2 KM	1999.36	0.64	1999.36	0.64	
3 KM	2999.04	0.96	2997.91	2.09	
4 KM	3998.31	1.69	3995.55	4.45	
FINISH	4997.78	2.22	4995.03	4.97	

For those who used the larger constant, the following chart applies:

START TO	SHORTER TOTAL	DISTANCE TO ADD IF EACH SPLIT IS TO BE CERTIFIED	SOSS TOTAL	DISTANCE TO ADD IF EVERY KM INTERVAL IS TO BE CERTIFIED	(Based on larger constant)
1 KM	999.40	0.60	999.40	0.60	
2 KM	1998.80	1.20	1998.80	1.20	
3 KM	2998.19	1.81	2997.07	2.93	
4 KM	3997.18	2.82	3994.43	5.57	
FINISH	4996.38	3.62	4993.63	6.37	

It is interesting to note how little difference comes about because of use of larger or average constant. If calibration variation had been larger, we would see greater differences. That is the value of the larger constant. It penalizes measurements in proportion to the uncertainty in the calibration.

MEASUREMENT VIDEO

Amy Morss and Tom McBrayer are each working on a video. I'll let you know of progress as I hear and read it.

NEW DOWNHILL MILE CHAMPION

Mark Courtney sent a copy of the certificate for his Mercer Miracle Mile (PA 84063 PR) after he saw the list of downhill miles in the last issue. Because it was certified before 1987, it was not included in the list search (pre-1987 courses don't have drop and separation listed). Anyway, it tops the list with a whopping 200 foot drop, or 38 m/km.

Updates to Measurement Computer Program

by Bob Baumel

For the past several years, many measurers and certifiers have been able to simplify their measurement calculations by using a computer program I wrote for that purpose in 1987. I originally wrote this program for the Apple Macintosh, but Alan Jones adapted it (in Aug 1989) for IBM-compatible PCs, so it is now available for the vast majority of personal computers. (Unfortunately, there is still no version for some lesser-used computers such as Commodore, Amiga, and Apple II).

The present article has two purposes: (1) to describe some changes I've made to the program since I first wrote it; and (2) to introduce the program to anybody who hasn't tried it yet.

Program Revisions

Actually, I've made only a few changes to this program, which have been relatively minor (except for one change to the PC version that actually changed the numerical answers it produces). In any case, since I will provide the program free of charge to anybody who wants it (All I ask is that you send me a blank floppy to put it on), there's no reason not to get the latest version.

I will discuss separately the changes I've made to the PC and Mac versions. Since the changes to the PC version were more extensive, I'll discuss those first:

PC Version:

- 1) In Summer 1990, Tom Knight discovered that some of the numbers computed by the PC version weren't accurate to the full number of decimal places displayed. (This occurred only with the PC version; the Mac version worked fine.) The problem had crept in when Alan Jones adapted my original Macintosh code to run on the PC, as some quantities got reduced from double to single precision. I then modified the PC version so it would give the same answers as the Mac version.
- 2) Just recently (July 1991), when Tom Knight and I tried demonstrating the program for Carl Wisser (who was using it for the first time), we identified a type of data-entry error that users can make easily—where the user accidentally hits the Enter key when prompted for the ending count of a calibration ride. I have now modified the program to avoid this problem.

Mac Version:

- 1) Revision number (2) described above for the PC version has also been implemented in the Mac version.
- 2) I figured out how to customize the Mac version so that the text files it creates (data files and report files) think they were created by any desired word processor—so double-clicking one of these files opens the intended word

processor. (Unfortunately, I still don't know how to make this feature user-configurable. I must "hard-wire" it into the program, which means that when you order the program from me, you must tell me which word processor you would like to use as your "text file creator type.")

What Does the Program Do?

The program helps you check the calculations in a course measurement (either for certification or validation), usually with less effort than by using a pocket calculator. In the process, it calculates more quantities than you're likely to do by yourself (specifically, the individual measured distances for every split-to-split interval, and the "Sum of Shortest Splits" distance). This provides useful checks on data quality. These quality-control checks are especially valuable for certifiers, but can be useful to any measurer who would like to catch problems with his or her data before the certifier does!

The program accepts the raw data of a measurement, and produces a report of the results. It also provides a mechanism which makes it relatively easy to correct errors in data-entry or to re-do calculations with minor changes. In particular, after you type in the data for a measurement, the program outputs **two** files: One is the "report file" suitable for printing; the other is a "data file" containing the raw data in a form that can be read back into the program.

If you find that you made a mistake in entering the data, then instead of starting over from scratch, you can simply edit the data file to fix the mistaken entry. Then re-run the program using the data file as input. Or suppose, for example, that you perform a calculation using Larger Constant but you'd also like to see how it would work out by Average Constant. The data file lets you do this very quickly. (As still another use of the data file, see the sample calculation later in this article.)

Here are some other specific features of the program:

- ◆ Calculates results for either one or two measurements, by either one measurer or two different measurers.
- ◆ Has four options for calculating distance: by LARGER or AVERAGE constant, WITH or WITHOUT 1.001 factor. Thus, program is usable for both certification and validation measurements.
- ◆ Calculates distance for every split-to-split interval for each measurement; also finds sum of the "better" (shorter) measurements of all intervals ("Sum of Shortest Splits").
- ◆ Handles 5 or 6 digit Jones counters; accounts for counter wraparound at 00000 or 000000.
- ◆ Accepts calibration data recorded with or without wheel-freezing. When wheel-freezing is used, lets you avoid duplicate entries.
- ◆ The program comes with extensive documentation on the disk.

The program does have some limitations. For example, it assumes that counter

readings on the *race course* (although not necessarily the calibration course) form an unbroken sequence. If not, you may need two or more runs of the program to fully analyze the measurement.

Also, even though *Road Race Management* once referred to this program as "certification software," it's really just a *measurement calculation* program. It won't completely fill out the certification application forms for you. I should point out, however, that if you edit the program's "report file" by adding times, temperatures, and your final adjustment to the race course, then the result *can* completely replace the Bicycle Calibration Data Sheet and Course Measurement Data Sheet.

Why Use This Program?

If you want to do measurement calculations on a computer, you have basically three choices:

- 1) Use a dedicated program for this purpose, such as the one I've written.
- 2) Use a "spreadsheet" program such as Lotus 1-2-3, Excel, Wingz, etc. to work up your calculations.
- 3) Use a "forms generator" program to make an electronic version of the certification forms, automating some or all of the calculations.

The third approach can, in fact, fill out all your application forms, but is rather limited with regard to calculations because it provides only the calculations requested on the standard application forms. Thus, it won't give you the *extra* calculations that my program performs to check data quality.

The second approach (spreadsheet program) is preferred by a number of measurers including Pete Riegel. It has the advantage that you can customize a spreadsheet to handle arbitrarily complex measurements (where the course is pieced together from many segments measured in different directions). I agree that when the measurement gets complicated enough, a spreadsheet is the only way to go. But for the vast majority of measurements which aren't that complicated, I find it simpler to use my program.

My program has lots of specialized knowledge about measuring that would be rather difficult to program into a spreadsheet. For example, it knows all about counter wraparound on 5-digit and 6-digit Jones Counters. So in almost all cases, you can simply enter the readings just as they appear on the counter (without any carry-over digits).

My program knows that measurers sometimes do or don't use wheel-freezing on calibration rides. Thus, the program easily handles many variations; for example, where one rider uses wheel-freezing and the other doesn't, or where a single rider uses wheel-freezing on only some of his calibration rides. If you use a spreadsheet, each of these variations would require a separately customized sheet.

My program also knows that sometimes both measurements are done in the same direction and sometimes they aren't. (For example, first measurement from Finish

to Start and second from Start to Finish.) Once again, my program easily handles these variations, but a spreadsheet would need to be customized for each case.

If you make a mistake in data entry, it's easier to correct using the spreadsheet approach. But the "data file" feature of my program makes it *almost* as easy to fix such errors. I should also point out that the Macintosh and PC versions of my program generate *identical* data files. Thus, a data file produced by the PC version can be read in by the Mac version and vice-versa. (To accomplish this, you do need a utility such as Apple File Exchange, which is supplied with the Mac system software, to convert between Macintosh and PC text files.)

How to Obtain the Program

As mentioned earlier, I distribute the program free of charge. Just send a floppy disk and return mailer to me at 129 Warwick Road, Ponca City, OK 74601. For the Mac version, you can send either a double-density (800 kb) or high-density (1.4 Mb) disk. For the PC version, you can send any size floppy disk, although you'll probably get it faster if you send one of the smaller 90 mm (3.5 inch) ones.

Please say whether you want the Mac or PC version. If you want the Mac version, you may also specify a word processor to serve as the "creator type" for the data files and report files that the program generates—so that double-clicking one of these files opens the desired word processor. (To be sure I get it right, include a file created by your word processor on the disk you send me.) If you don't tell me which creator-type you want, the default is Microsoft Word.

Sample Output from Program

The following page shows results of the program for the Puzzle in July '91 *Measurement News*. (I don't regard this as an entry in the contest, considering the late date of this mailing. I include it only to illustrate the program.) Actually, this page was formed by pasting together **two** runs of the program. First I ran it for the whole 5 km course. Then I ran it for just the first 4 km. (To obtain this 2nd run, I didn't need to re-enter any data. I just edited the data file produced by the first run. Specifically, I deleted the "Finish" label and counter readings from this data file. Then I re-ran the program using this edited data file as its input.)

The displayed results for the first 4 km are enough to answer Pete's 3 questions:

- 1) To comply with condition 1 (certify distance from Start to each km split point): The lesser measured distance from Start to 4 km point is 3997.18 m. Thus, the 4 km point should be moved 2.82 m toward Finish. (This assumes that the Start is to be kept fixed while each km split and the Finish is adjusted.)
- 2) To comply with condition 2 (certify each km interval): The Sum of Shortest Splits distance from Start to 4 km point is 3994.43 m. Therefore, the 4 km point should be moved 5.57 m toward Finish.
- 3) The data quality is not very good, as the two measurements differed by 1.6 m in the first kilometer, and by 2.0 m (in the other direction) in the 4th kilometer.

Measurement News Puzzle 5 km

Measured: July 1991

Length of Calibration Course = 499.9436 m

Measurements Computed using LARGER Constants INCLUDING 1.001 factor

IAAF Measurer???

Pre-Calibration:

Start	Finish	Counts
00000	04896	4896
00000	04896	4896
00000	04896	4896
00000	04895	4895

Working Constant: 9802.3972 counts/km

Post-Calibration:

00000	04899	4899
00000	04899	4899
00000	04898	4898
00000	04898	4898

Finish Constant: 9807.9033 counts/km

Constant for Day: 9807.9033 counts/km

Course Measurement (Entire 5 km course):

	Counter Reading	Interval (counts)	Interval (meters)	Counter Reading	Interval (counts)	Interval (meters)
Start	61900			60004		
1 km	71702	9802.0	999.40	50186	9818.0	1001.03
2 km	81504	9802.0	999.40	40373	9813.0	1000.52
3 km	91306	9802.0	999.40	30582	9791.0	998.28
4 km	01108	9802.0	999.40	20800	9782.0	997.36
Finish	10910	9802.0	999.40	11000	9800.0	999.19
Totals:		49010.0	4996.99		49004.0	4996.38

(Sum of Shortest Splits = 4993.63 meters)

Course Measurement (First 4 km only):

	Counter Reading	Interval (counts)	Interval (meters)	Counter Reading	Interval (counts)	Interval (meters)
Start	61900			60004		
1 km	71702	9802.0	999.40	50186	9818.0	1001.03
2 km	81504	9802.0	999.40	40373	9813.0	1000.52
3 km	91306	9802.0	999.40	30582	9791.0	998.28
4 km	01108	9802.0	999.40	20800	9782.0	997.36
Totals:		39208.0	3997.59		39204.0	3997.18

(Sum of Shortest Splits = 3994.43 meters)



TADEUSZ DZIEKOŃSKI
ul. Czarobrego 4 in. 8
15-057 Białystok
POLAND

Dear Mr Paulin,

July 6-7 I have measured the Siberian Marathon course.

I enclose all required documents.

All organizational requirements were prepared very good by the Race Director Mr Sergey Gavrilov. I had problem only with my back travel - due to the Soviet Airlines. All Saturday and Sunday I was working with Mr Gavrilov, Vasili Konovalov, Leonid Afanasiev and Aleksandr Krasnov.

As you see the course is not easy to organize and run. On many portions there must be put cones or cones with rope, because on the same roads are two directions to run. So, during my measurements I have used the left and right parts of those portions. The Race Director promise to change the course when the town authority will allow to use other roads.

Thanks to Pete Riegel I have used the solid tire/polyurethane and nylon/, which I received two days before my travel to Omsk and I had not time to check it/to fit/. So, the pre-calibration data of the first measurement are not close to the post-calibration and the pre- and post-calibration data of the second measurement. But my opinion is one: a solid tire is very useful/only a little reacts to temperature changes/.

Second measurement is the official/lower value/. Last year's course /1st marathon/ was 566,7 m short. So, I have moved the finish line 100 m forward/last year the start and finish lines were the same line/ and the turnaround point no 2 233,35 m/233,35 m to and back is 466,7 m/ forward too.

I think a map we should prepare on the format A 3, because it is easier to out-line and show all details.

Please send me any comments on my documentation/and work/.

As for my last letter. You did not understand my questions. I explain you on the example of Omsk:

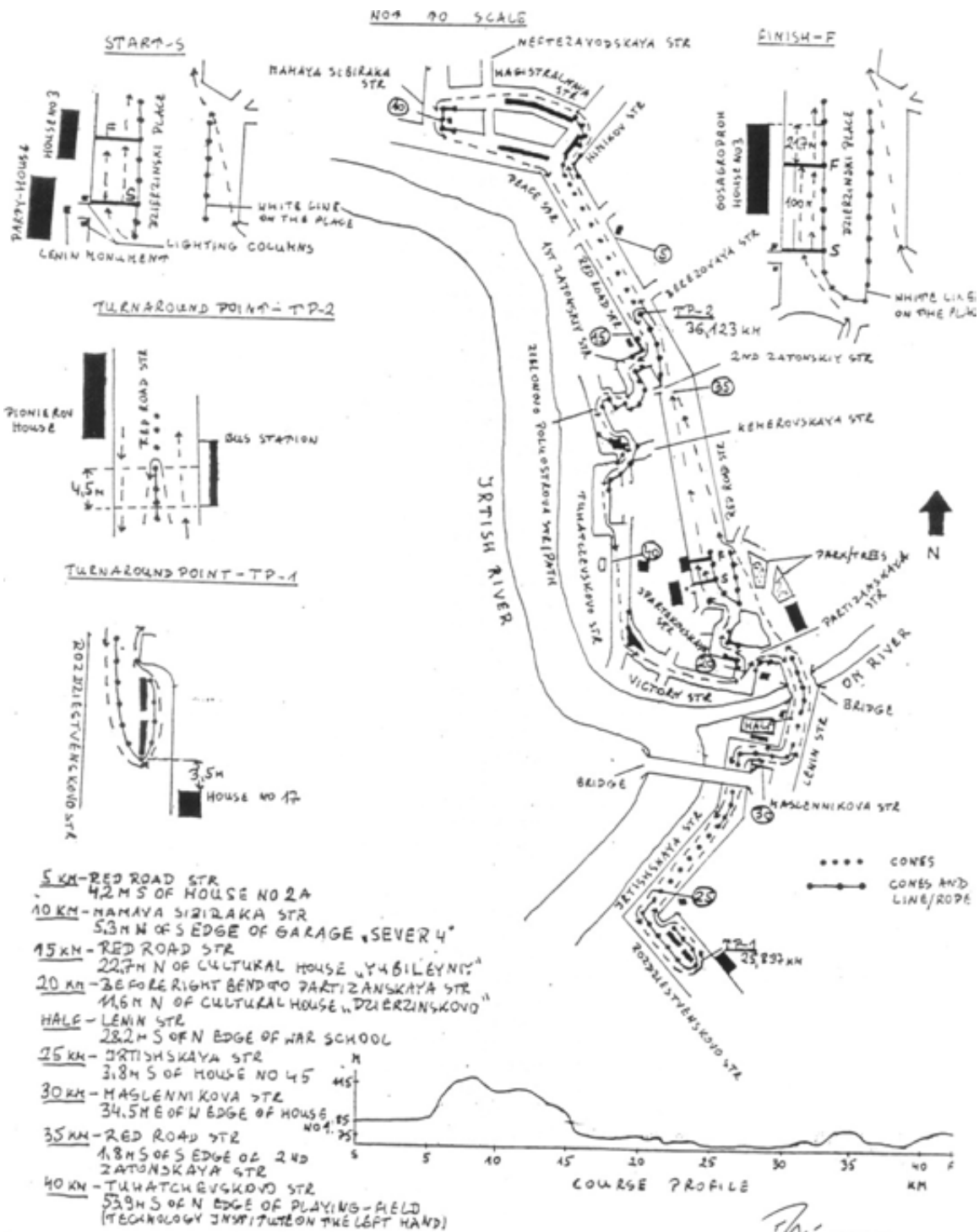
- measurement made by me/all expenses by the organizer/,
- validation made by an expert, to check my measurement /all expenses by/

You can contact me by the telex/no 853103 Białystok/ but you must write: Tadeusz Dziekoński - Izba Skarbowa, because it is other institution's telex no/but the same building as my office's/.

With best wishes

copy to: Pete Riegel

Białystok/Pol, July 15, 1991



- 5 KM - RED ROAD STR
4.2 M S OF HOUSE NO 2A
- 10 KM - NAMAYA SIBIRAKA STR
5.3 M W OF S EDGE OF GARAGE "SEVER 4"
- 15 KM - RED ROAD STR
22.7 M N OF CULTURAL HOUSE "YABILEYNI"
- 20 KM - BEFORE RIGHT BEND TO PARTIZANSKAYA STR
11.6 M N OF CULTURAL HOUSE "DIERZINSKOVO"
- HALE - LENIN STR
28.2 M S OF N EDGE OF WAR SCHOOL
- 25 KM - IRTYSHSKAYA STR
3.8 M S OF HOUSE NO 45
- 30 KM - MASLENNIKOVA STR
34.5 M E OF W EDGE OF HOUSE NO 17
- 35 KM - RED ROAD STR
1.8 M S OF S EDGE OF 2ND ZATONSKAYA STR
- 40 KM - TSVETKOVSKAYA STR
53.9 M S OF N EDGE OF PLAYING-FIELD (TECHNOLOGY INSTITUTE ON THE LEFT HAND)

SIBERIAN INTERNATIONAL MARATHON COURSE
OMSK - USSR

TADEUSZ
DZIEKOWSKI/POL
ATMS MEASURER
JULY 7, 1991

The Rundown
By Wayne B. Nicoll

The controversy created by TAC rule 185.5 continues to simmer. The rule was revised two years ago to establish new standards for road races in terms of the elevation drop from start to finish, and the allowable straight line distance between the start and the finish. The current elevation drop limit is one meter per kilometer and no one, except the Boston running community, has any argument with that standard. The former rule allowed 2 meters per kilometer, so the effect was a tightening of the standard. The portion of the rule dealing with wind has been under attack since the rule's inception. The rule requires a spread between the start and finish of a distance equal to or less than 30% of the race distance. This was actually a relaxation of standards as the former rule required that the start/finish distance could not exceed 10% of the course distance. The purpose of the separation requirement is to limit the possibility of unfair wind aid to the runners.

The above changes to the rule increased the number of record eligible courses from about 75% to over 90%. It still left a few prominent point to point races, such as the New York City Marathon and the Crescent City Classic, ineligible for records. In an effort to offer some hope for events with over a 30% spread between the start and finish, the Road Running Technical Committee (RRTC) suggested an added phrase to the rule that would allow point to point races to collect wind data under the guidance of the RRTC. If after a review of the wind data, the RRTC found there was no significant wind assistance to the runners in that race, any records achieved would be considered for ratification. Unfortunately the addition of this offer to review wind data brought more attention to the subject and opponents of the rule were out in force at the '90 TAC/USA Convention. In a Mens LDR meeting a motion to eliminate wind standards entirely was denied by a squeaker vote of 26-23. Several of the high profile LDR leaders felt the closeness of the vote called for a search for a compromise solution.

An ad hoc committee comprised of selected LDR representatives was formed and met in Tampa this winter. The committee agreed to accept the record keeping concept of producing and displaying both "best performances" (which may have been achieved on a non-records eligible course) and the ratified U.S. National records in the TAC/USA rule book. As Basil Honikman has stated, "The purpose of a record system is to serve the sport and its participants. Great achievements and breakthrough performances are essential to the history and an indisputable part of the annals of distance running." It is an answer to those critics who predicted the rule would wipe out forever the significant running performances in Boston, New York, and other events.

The Ad Hoc committee was not so harmonious when it dealt with the wind issue. Some members felt that wind standards should be dropped and wind should be treated as just another element of weather. The rule, for example, does not deal with temperature or humidity. The effect of dropping the wind standard would be to permit records to be set on straight downwind courses where runners could gain substantial advantage. A tailwind of slightly less than 5 miles per hour can have the effect of shortening a 10 Kilometer course by 400 meters! The opponents of wind standards argue there is no reliable way to collect wind data. The RRTC has done some limited experimenting with anemometers and streamers, and they feel it is possible to adapt wind gauging technology to the sport. The RRTC is not enthusiastic about continuing to develop a wind measurement capability. They would rather see a 30% separation standard in effect - period. In other words, drop from the rule any reference to the collection of wind data and retain the clear standards of limits of one meter per kilometer in elevation drop and 30% separation between the start and finish.

Pete Riegel, RRTC Chairman, recently stated his views in a letter to the Ad Hoc Committee. Here are some of his reasons for retaining the course separation at 30% and eliminating any attempts at wind measurement.

- 1) On a wind measured course, runners will not know at the start whether a super effort will count. A standard course is record ready as long as the runner runs fast, the correct measured path is followed, and the timing is correct.
- 2) If the separation provision is eliminated, runners who compete on point to point courses will have an enormous advantage over those who compete on standard loops. It will put 90% of the sport's races at a disadvantage.
- 3) If the separation limit is lifted, it will be a golden opportunity to set up straight line races, put down some inducement money, and gain records. It would be too much for some promoters to resist.

Pete quotes an example of the inequity that can result when no standards are in effect. In 1981 a month after Alberto Salazar ran 2:08:13 on the (point to point) New York City Marathon course (that was later found to be short), Rob DeCastella ran 2:08:18 on a standard course at Fukuoka. An international system of standards in place at that time would have allowed DeCastella to reap what he justly deserved, but never received, (assuming Fukuoka would have been validated to be the correct length). Pete states, "Instead, Salazar got a three year free media ride and economic benefits, while DeCastella got zip. Deke was denied his due by unofficial recognition of an aided run as a record ... The history of the sport is written in its records, long after the TV show is forgotten. It is best if they reflect real, unaided effort, not how fast someone can run on a short, downhill, or windy course".

ROAD RACE MANAGEMENT



2101 Wilson Blvd., Suite 437
Arlington, VA 22201

August 1, 1991

Pete Riegel
3354 Kirkham Rd.
Columbus, OH 43221

Dear Pete:

Here is some interesting data which I haven't seen before for people to kick around in the Rule 185.5 debate. I noted that Ken Young suggested recently that some empirical data be examined about Boston performances. The following chart is taken from the top 50 male and female fastest performances at Boston. I have tracked, using Road Race Management Guide to Prize Money Races and Elite Athletes data, the PRs for the owners of Boston's top 50 times. This should provide some insight into how many of these runners set PRs on the Boston course. When a single runner has run more than one top-50 ranked time, the notation "Faster BAA time" is made to indicate that there is a faster time for that runner on the list. I have given Alberto Salazar credit for a 2:08:40 on the 1981 New York City course.

There certainly does seem to be a high number of PRs set on the Boston course--higher among the men (25 Boston PRs versus 8 faster times set on all other courses) than among the women (16 Boston PRs versus 15 PRs set on all other courses).

I'll let the statisticians, scientists and politicians take over from here.

Sincerely,

A handwritten signature in black ink, appearing to read 'Phil Stewart', with a large, sweeping flourish on the left side.

Phil Stewart
(2:19:58 Boston/2:23:43 elsewhere)

BAA Rank	BAA Time	PR Time	Fname	Lname	Notes
MEN					
1	2:07:51	PR	Rob	DeCastella	
2	2:08:19	PR	Gelindo	Bordin	
3	2:08:43	PR	Ibrahim	Hussein	
4	2:08:44	2:08:00	Juma	Ikangaa	
5	2:08:52	2:08:40	Alberto	Salazar	Adj. '81 NY
6	2:08:54	PR	Dick	Beardsley	
7	2:09:00	PR	Greg	Meyer	
8	2:09:06	2:07:35	Abebe	Mekonnen	
9	2:09:15	PR	John	Treacy	
10	2:09:26	2:08:??	Toshihiko	Seko	
11	2:09:27	PR	Bill	Rodgers	
12	2:09:27	Faster BAA	Gelindo	Bordin	
13	2:09:31	PR	Ron	Tabb	
14	2:09:33	PR	Gianni	Poli	
15	2:09:52	Faster BAA	Juma	Ikangaa	
16	2:09:55	Faster BAA	Bill	Rodgers	
17	2:09:56	Faster BAA	Juma	Ikangaa	
18	2:09:57	PR	Benji	Durden	
19	2:10:06	PR	Ed	Mendoza	
20	2:10:12	Faster BAA	Toshihiko	Seko	
21	2:10:13	Faster BAA	Bill	Rodgers	
22	2:10:15	PR	Jeff	Wells	
23	2:10:24	Faster BAA	John	Treacy	
24	2:10:26	PR	Craig	Virgin	
25	2:10:30	2:09:28	Ron	Hill	
26	2:10:34	2:09:08	Geoff	Smith	
26	2:10:34	Faster BAA	Bill	Rodgers	
28	2:10:46	PR	Rolando	Vera	
29	2:10:54	PR	Chris	Bunyan	
30	2:11:03	PR	Dave	Edge	
31	2:11:04	PR	John	Campbell	
32	2:11:06	Faster BAA	Ibrahim	Hussein	
33	2:11:08	Faster BAA	John	Campbell	
34	2:11:12	PR	Eamon	O'Reilly	
35	2:11:15	PR	Esa	Tikkanen	
36	2:11:15	PR	Art	Boileau	
37	2:11:16	PR	Jack	Fultz	
38	2:11:22	Faster BAA	Abebe	Mekonnen	
39	2:11:24	??	Michael	Layman	
40	2:11:25	PR	Randy	Thomas	
41	2:11:27	PR	Andy	Ronan	
42	2:11:28	Faster BAA	Rob	De Castella	
43	2:11:33	??	John	Lodwick	
44	2:11:35	PR	Malcolm	East	
45	2:11:36	PR	Dan	Schlesinger	
46	2:11:42	Faster BAA	Jeff	Wells	
47	2:11:43	PR	Kevin	Ryan	
48	2:11:43	2:10:23	Orlando	Pizzolato	
49	2:11:50	Faster BAA	Toshihiko	Seko	
50	2:11:52	2:10:52	Jukka	Toivola	

BAA Rank	BAA Time	PR Time	Fname	Lname	Notes
WOMEN					
1	2:22:43	2:21:16	Joan	Samuelson	
2	2:24:18	PR	Wanda	Panfil	
3	2:24:30	2:23:29	Rosa	Mota	
4	2:24:33	2:21:07	Ingrid	Kristiansen	
5	2:24:55	Faster BAA	Ingrid	Kristiansen	
6	2:25:21	Faster BAA	Rosa	Mota	
7	2:25:24	Faster BAA	Rosa	Mota	
8	2:26:40	PR	Kim	Jones	
9	2:26:46	2:25:29	Alison	Roe	
10	2:26:52	PR	Uta	Pippig	
11	2:26:54	Faster BAA	Joan	Samuelson	
12	2:26:55	PR	Kamilia	Gradus	
13	2:27:35	2:26:34	Carla	Beurskens	
14	2:27:51	PR	Patti	Lyons	
15	2:28:03	Faster BAA	Uta	Pippig	
16	2:28:53	PR	Maria	Trujillo	
17	2:28:56	Faster BAA	Kamilia	Gradus	
18	2:29:04	PR	Marguerite	Buist	
19	2:29:26	2:28:45	Tuija	Jousimaa	
20	2:29:27	PR	Jacqueline	Gareau	
21	2:29:28	2:28:17	Lorraine	Moller	
22	2:29:33	2:28:32	Charlotte	Teske	
23	2:29:34	Faster BAA	Kim	Jones	
24	2:29:50	PR	Agnes	Pardaens	
25	2:29:51	Faster BAA	Ingrid	Kristiansen	
26	2:29:56	2:28:11	Ria	Van Landeghem	
27	2:30:16	Faster BAA	Joan	Samuelson	
28	2:30:18	PR	Conceiao	Ferreira	
29	2:30:35	PR	Odette	LaPierre	
30	2:30:48	2:26:51	Priscilla	Welch	
31	2:30:54	PR	Julie	Shea	
32	2:30:56	PR	Lizanne	Bussieres	
33	2:31:01	Faster BAA	Kim	Jones	
34	2:31:09	2:25:56	Veronique	Marot	
35	2:31:15	2:27:57	Zoya	Ivanova	
36	2:31:26	Faster BAA	Jacqueline	Gareau	
37	2:31:33	Faster BAA	Odette	LaPierre	
38	2:31:36	??	Ellen	Rochefort	
39	2:32:13	PR	Malgorzat	Birbach	
40	2:32:16	Faster BAA	Lizanne	Bussieres	
41	2:32:47	PR	Evy	Palm	
42	2:32:55	Faster BAA	Odette	LaPierre	
43	2:33:02	2:32:57	Sissel	Grottenberg	
44	2:33:04	??	Eriko	Asai	
45	2:33:08	??	Manuela	Marchado	
46	2:33:18	PR	Sinikka	Keskitalo	
46	2:33:18	2:28:15	Lisa	Weidenbach	
48	2:33:23	??	Mary	Shea	
49	2:33:35	??	Karen	Dunn	
50	2:33:40	2:30:54	Julie	Isphording	



The
Athletics Congress
of the USA

*The Governing Body for Athletics in the United States
including Track and Field, Long Distance
Running and Race Walking for
men and women and boys and girls
at all age levels.*

MIKE WICKISER

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Silver Lake, Ohio 44224
(216) 929-1605

MINNESOTA VALIDATION TRIP REPORT
July 25 - 28, 1991

The purpose of this trip was to perform validation measurements of three race courses. Those being Twin Cities Marathon (MN90017RR), Minnesota Masters 15k (MN90012RR), and City of Lakes 25k (MN90015RR). Each of which is detailed in separate attached reports.

Arrangement for this validation was made with Jack Moran and Rick Recker so that both could be available as they were the original measurers. Rick was gracious enough to help coordinate available times with Jack as well as offer his home, and spare bed to serve as a base for my time in town.

As I was checking my luggage and bicycle at the airport, I was informed that a charge of \$45.00 each way would be charged to transport the bike. This shocked me as no such cost had been incurred on my trip earlier this year to Curacao. It seems rates differ between domestic and international flights. I apologize for this unexpected expense.

Arriving in Minneapolis on Thursday evening, I took the airport limo to Rick's condominium. There we went over a schedule for the weekends measuring activities. We would begin early Friday morning by checking a 300 meter cal course previously laid out on the Washington pedestrian bridge by Rick Recker and A.C.Linnerud. This cal course proved to be exactly 300 meters and was used for all three validations. The rest of the day was spent measuring the marathon course.

Saturday morning found Rick Recker and myself again riding early. This days measurement was to be The City of Lakes 25k in quite a bit of rain.

Sunday, I met Jack Moran and he guided me over the Minnesota Masters 15k race course. I was able to complete this measurement, crunch data and inform Jack of the final results with time left over to shower, pack and have a farewell breakfast with Rick Recker before returning for my flight home.

All measurements went well and I thank Jack Moran and especially thank Rick Recker for help in this endeavor. Both were of assistance with their respective race measurements and Rick was the kind of host a Validator hopes for !

Respectfully submitted,

Mike Wickiser
Mike Wickiser

TWIN CITIES MARATHON

Measured: 07/26/91

Length of Calibration Course = 300 m
Measurements Computed using AVERAGE Constants WITHOUT 1.001 factor

MIKE WICKISER

Pre-Calibration:

Start	Finish	Counts
09900	12721	2821
12721	15542	2821
15542	18363	2821
18363	21184	2821

Working Constant: 9403.3330 counts/km

!!! STEADY!

Post-Calibration:

54150	56971	2821
56971	59792	2821
59792	62613	2821
62613	65434	2821

Finish Constant: 9403.3330 counts/km

Constant for Day: 9403.3330 counts/km

Course Measurement:

	Counter Reading	Interval (counts)	Interval (meters)
START	41700		
5 KM	88783	47083.0	5007.05
10 KM	35842	47059.0	5004.50
15 KM	82923	47081.0	5006.84
20 KM	30000	47077.0	5006.42
25 KM	77010	47010.0	4999.29
30 KM	24067	47057.0	5004.29
35 KM	71136	47069.0	5005.57
40 KM	18119	46983.0	4996.42
42.195 KM	38835	20716.0	2203.05
Totals:		397135.0	42233.43

TWIN CITIES MARATHON MN 90017 RR

VALIDATION SUPPORTING DATA RIDE INFORMATION

MEASURER : RICK RECKER 7/26/91

ALL DATA PRESENTED IN WHEEL REVOLUTIONS AND (SPOKE COUNTS)

36 SPOKE COUNTS EQUAL ONE WHEEL REVOLUTION

300 METER WASHINGTON BRIDGE CAL COURSE

PRE-CALIBRATION

POST-CALIBRATION

RIDE #1 141 (6)

RIDE #1 141 (3)

RIDE #2 141 (7)

RIDE #2 141 (4)

RIDE #3 141 (6.5)

RIDE #3 141 (3.5)

RIDE #4 141 (6.5)

RIDE #4 141 (3.5)

AVERAGE 141 (6.5)

AVERAGE 141 (3.5)

AVG. PRE-POST CALIBRATION VALUE 141 (5) = 141.1388888

CONSTANT IN COUNTS PER KILOMETER 470.46296267

TOTAL COUNTS ON COURSE : 19872 (16.5) = 19872.45833

MEASURED DISTANCE OF COURSE IN KILOMETERS = 42.24021848

GOOD AGREEMENT WITH WICKISER

SPOKE COUNTING DATA! SEEN ANY OF THIS LATELY?