

# MEASUREMENT NEWS



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September

1992

Issue #55

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Measurement trips sometimes bring more than you expect. Last year, Pete Riegel gave a measurement seminar in Penang, Malaysia. During some free time, his host, L. Podimhatia, took him on a tour and to a wedding. Here we see Pete (right) and Podim enjoying the company of the residents of the Snake Temple. Podim assured Pete that the vipers are lethargic from the incense, and do not often bite. Podim was the featured measurer on the cover of January, 1992 issue.

## MEASUREMENT NEWS

#55 - September 1992

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### HAIL AND FAREWELL

Last month Bob Baume1 resigned as Western Vice-Chairman, and appointed Tom McBayer as interim VCW. It is no longer an interim appointment. I am pleased to confirm the appointment of Tom McBayer as Western Vice-Chairman.

Bob has been in the measurement game for a more than a decade. He first served RRTC as Oklahoma Certifier, and in 1986 was appointed to the post he has now vacated. He took the job seriously, and did it well. We owe him not only for the competent performance of his administrative duties, but even more for the many insightful articles he produced on a variety of technical subjects relating to measurement, running and the virtues of the metric system.

If this sounds like his obituary, it isn't. Bob will continue as OK and SD Certifier, and expects to continue to participate in our technical work.

Tom McBayer has been the Texas certifier since 1988, and took on Louisiana in 1991. During that time he has measured scores of courses and certified hundreds. He and Mary Anne are very active in the Texas running scene, and have done much to make it better. Welcome, Tom.

### NEW APPOINTMENTS

As Bob Baume1's final appointment, George Tuthill is now National Road Course Certifier (Final Signatory) for Montana. Congratulations, George.

Wayne Nicoll has rearranged the East as follows: Ray Nelson is now certifier for MA and RI. Gene Newman replaces Dan Brannen in NJ, who requested replacement due to the press of other work. Woody Cornwell is now certifier for GA. Wayne will be the certifier for ME, NH and VT.

### ADDITION TO 10 OR MORE

John Felix of New York measured 10 courses in 1991. His name was inadvertently omitted from the lists published in the May and July issues.

### NEW CERTIFICATE FORMS

All RRTC certifiers will find copies of new certificate forms included with this issue. They are the same as the ones that were sent earlier last month, but the copy quality is better. The quality on the original ones, copied by me from Bob Baume1's originals, was not very good. Bob kindly printed a new original, direct from the printer with no intermediate copying, for each certifier. This should result in certifiers having the best possible copy to start with. Race directors and measurers, like all of us, appreciate neatness, and form a part of their opinion of us from what we send them. This new certificate form will help.

## AN UNFUNNY COMEDY OF ERRORS

I recently had a call from an upset race director. He had sent results to TACSTATS, only to be informed that the course number he cited was not on the list of certified courses. The race director did not receive a certificate from the measurer, but was only told a course number. I said I would check.

I found that the certifier's 1991 list contained a few numerical gaps, and that one gap would have included the course in question. From this I concluded that he had received measurement data from the measurer, and given the measurer a course number. After that, the certifier either did not follow through and produce a certificate, or a lot of things got lost in the mail.

Nobody informed Joan of the absence of the course from the listings in Measurement News, although both the certifier and the measurer receive it.

The measurer billed the race director for his services, and the director paid, but never received a certificate. According to the certifier, the measurer has a history of sending incomplete packages at the last minute, with the rest to follow - but follow-up in this case took 6 months.

I advised the race director never to pay for a certified course until he holds the certificate in his hand, and that the race-day course is not certified unless the data has been sent for review before race day, regardless of what song the measurer sings.

Here is how things are supposed to work:

- 1) The measurer sends data to the certifier.
- 2) If everything is OK, the certifier issues a certificate, sending two copies back to the measurer, who should then send a copy to the person who engaged him for the job.
- 3) The certifier also sends two copies of the certificate to the Vice Chairman, who files one and sends the other to the Course Registrar, where it is put on the list of certified courses, and filed.
- 4) The newly-certified course is listed in the next Measurement News, and is added to the list of TAC certified courses.

What are the lessons here?

- 1) The date the paperwork was sent is the date the last needed piece arrives.
- 2) Measurer should send a copy of the certificate to the race director.
- 3) Courses should be forwarded to Course Registrar promptly.
- 4) Concerned people should check listings in Measurement News to see that all is OK, and write if things are missing.
- 5) A race director should not pay for a certified course until he holds the certificate.



**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.*

**WAYNE B. NICOLL**  
Ragged Mountain Club  
Potter Place, New Hampshire 03265  
(603) 735-5721

Mike Wickiser  
Validations Chairman, RRTC  
2939 Vincent Road  
Silver Lake, OH 44224

14 August 1992

Dear Mike,

Enclosed is a pre-validation report on the re-measurement of the Carlsbad 5000 Road Run in Carlsbad, CA. This is the course I validated in 1986 and had conducted video validations of the event in the ensuing years. This re-measurement was deemed necessary when Ron Grayson, a local measurer, rode the course on race day in 1992 and reported to Tom Knight the course was short. Several measurers participated in the re-measurement - Ron Grayson, Carl Brandt (course manager), Bob Letson (the man who pioneered road race course certification in Southern CA), and myself. The course was found to be 4997.8 meters in length.

I arrived in San Diego on Friday evening, August 7. Tim Murphy, the race director, was unable to meet me due to serious illness in the family. I took a shuttle to Carlsbad, arriving at the hotel about midnight. The next morning I hiked to Carlsbad Village, rented a bike, and laid a 1000 foot calibration course. I had taken my 27" front wheel (the one you gave me with the Permafoam filled tire) but could not locate a bike (with upright handlebars and no toe clips) that would take that size wheel. The bike rental man was most helpful and rented me a Bridgestone hybrid that was the perfect bike for measuring - mountain bike style handlebars, thumb shifters, light weight frame, 21 speeds, and even a kick stand. He even switched wheels so I could have smooth tires rather than lugged mountain tires. The only drawback to this bike was that the fat pneumatics were sensitive to temperature change, causing considerable change in counts from calibration to re-calibration. After a lunch break I calibrated on my 1000 footer, and rode to the Oceanside 880 calibration course where I met Ron Grayson. Using the calibrations from the new 1000 foot course, I rode the Oceanside cal course - a really nice half mile right on the Strand at the beach. The course checked out OK despite the beach traffic. We rode on to the Carlsbad race course to look it over.

Examining the north turnaround point, I discovered there had been significant changes to the intersection. The intersection of Carlsbad Boulevard and Mountain View Road had formerly been an open intersection with painted traffic lanes and painted islands. I later learned from the race director that the changes were made two years ago. The intersection now has medians extending from both north and south directions, with an 17 foot break for northbound left lane

traffic to pass through. On the west side of the boulevard a new concrete island was constructed where painted lines had been before. The cone line was previously delineated by a line running from the Scandia Motel sign on the east side to a street sign pole on the west side that was in the old painted island. That sign pole has been moved from the island, making it impossible to get a good fix on the old placement of the cones. However, there were paint marks showing where the 1992 cones had been placed and the placement agreed with what I found on the raw video footage of the 1992 race. I estimate the cones were moved south about 2 meters, accounting for about 4 meters of the course shortness. I later learned from the course manager that some of the medians on the boulevard had been narrowed to create wider traffic lanes. This probably accounts for the remaining shortness.

Saturday evening I had dinner with Tim Murphy, race director, and we discussed my findings. I advised him I was quite sure we would find the course short and recommended to him that cones be eliminated at the north turnaround and all of the shortness be added at the start. He agreed with that suggestion. The measurers gathered at 7 AM Sunday at the new calibration course, calibrated, and rode the course from finish to start. We recalibrated and calculated results, which show all four measurers to be within 2 meters of each other. I returned my bike, and Carl Brandt took me back to the hotel where I caught a shuttle to the airport.

I have agreed to provide the data to the race director with the recommended addition of distance to the start to bring the course length up to 5005 meters. Carl Brandt will make adjustments to the start and the mile points and will forward the information to me. I will issue certificates for the revised race course and the new calibration course.

It is recommended this report be distributed to the RRTC Chairman and the Vice Chairmen, so an official decision can be rendered on recommendations for acceptance or denial of any pending and previously approved marks.

Sincerely,



Wayne B. Nicoll  
Validator

Carlsbad 5000 Validation Measurement - 9 August 1992

Calibrations done on Ocean St 1000 feet.

All calculations use AVERAGE constant WITHOUT extra 1.001.

PRECALIBRATION - 7:15 AM - 72F

Wayne Nicol1		Carl Brandt		Bob Letson		Ron Grayson	
910000		48000		98000		44200	
913330	3330	50925	2925	900	2900	47127.5	2927.5
916661	3331	53848	2923	3800	2900	50054	2926.5
919992	3331	56772	2924	6695	2895	52983.5	2929.5
923323	3331	59696	2924	9599	2904	55911	2927.5
Avg	3330.75		2924		2899.75		2927.75
Cts/km	10927.66		9593.176		9513.615		9605.479
Cts/m	10.92766		9.593176		9.513615		9.605479

POSTCALIBRATION - 8:28 AM - 78F

995000		22150		72000		19500	
998327	3327	25074	2924	74899	2899	22428.5	2928.5
1655	3328	27996	2922	77798.5	2899.5	25354	2925.5
4983	3328	30921	2925	80698	2899.5	28282	2928
8311	3328	33844	2923	83597	2899	31208.5	2926.5
Avg	3327.75		2923.5		2899.25		2927.125
Cts/km	10917.81		9591.535		9511.975		9603.428
Cts/m	10.91781		9.591535		9.511975		9.603428
Constant for Day, Cts/m	10.92274		9.592356		9.512795		9.604454

MEASUREMENT DATA

Counter Readings at Points

	Wayne	Carl	Bob	Ron
Finish	931000	66000	16170	63000
3 Mi	932877	67648	17805	64652
S-N Turn (coned)	940845	74639	24739	
F-N Turn (coned)	941090	74851	24945	
S-N Turn (SPR)	941090	74851	24945	
F-N Turn (SPR)	941274	75009	25099	
Start	985774	14103	63853	10963

Elapsed Counts Between Points - Coned Version of Course

Finish				
3 Mi	1877	1648	1635	1652
S-N Turn	7968	6991	6934	
F-N Turn	245	212	210	(206 adjusted to 210 per Letson)
Start	44500	39094	38754	46357.5
Total	54590	47945	47533	48009.5

Meters between points - Coned version of course

Finish				
3 Mi	171.84	171.80	171.87	172.00
S-N Turn	729.49	728.81	728.91	
F-N Turn	22.43	22.10	22.08	
Start	4074.07	4075.54	4073.88	4826.67
Total	4997.83	4998.25	4996.74	4998.67

In the above, the coned version of the course is that which Ron Grayson measured just before the race. In that previous measurement, Ron got a distance of 4997 meters, while Wayne Nicoll's original validation of the course, several years ago, got 5003.3. Since records were set, Wayne seemed the best candidate to figure out what happened. See his report in this issue.

The SPR version of the measurement was made to help set up next year's course so that it will not be susceptible to minor cone misplacements.



TADEUSZ DZIEKONSKI  
ul. Chrobrego 4 m. 8  
skrytka pocztowa 14)  
15-057 Białystok  
POLAND

Dear Pete,

Thank you very much for the next copy of "MNews" issue 54.

On the photo below/page 21/ you see me riding a calibration course.

Regarding your letter of June 1st, I agree that the final adjustment should be to add 20 m or rather make the next ride. Simple solution is when the second ride splits data are less value than in the first ride. If I do not make any mistakes/due to road traffic for example/ during the first and second rides, I almost always obtain less splits value in the second ride.

You wrote "the goal is a course that is not short". What do you say about the distance of 20.098 m/20K advertised/ which is not to short but 78 m to long ? I think it is not a 20K distance. Simply 20.098 m.

I do not vote to add sometimes some distance/your letter from page 40/ but I prefer the next measurement.

As for Carlsbad 5K validation, I think that the most important problem is to know by a validator a precise way which was measured by a measurer.

Here the data of pre- and post-cal rides from my the last measurements using the solid tire. I see the difference between pre- and post-cal data depends on humidity/wet or dry/ condition. Note: I used different bikes each time.

	<u>date</u>	<u>pre</u>	<u>post</u>	<u>difference</u>	<u>%</u>
wet	15.03.	9.277,7685	9.271,262	- 6,5065	0,0701
	21.03.	9.276,0167	9.269,0097	- 7,0070	0,0755
	10.05.	9.283,274	9.276,5172	- 6,7568	0,0727
dry	4.04.	9.279,27	9.280,0207	+ 0,7507	0,0080
	25.04.	9.288,5292	9.289,5302	+ 0,0010	0,0107
	7.06.	9.290,7718	9.280,271	- 0,5008	0,0053
	20.06.	9.284,275	9.285,276	+ 1,001	0,0107
	11.07.	9.283,5242	9.282,7735	- 0,7507	0,0080

Conclusion: to avoid wet weather. May be I should put the tire into the water before a measurement ?

With best wishes

Białystok/Pol, July 29, 1992

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THE ATHLETICS CONGRESS  
OF THE USA

3354 Kirkham Road  
Columbus, OH 43221

Road Running Technical Council  
Peter S. Riegel, Chairman

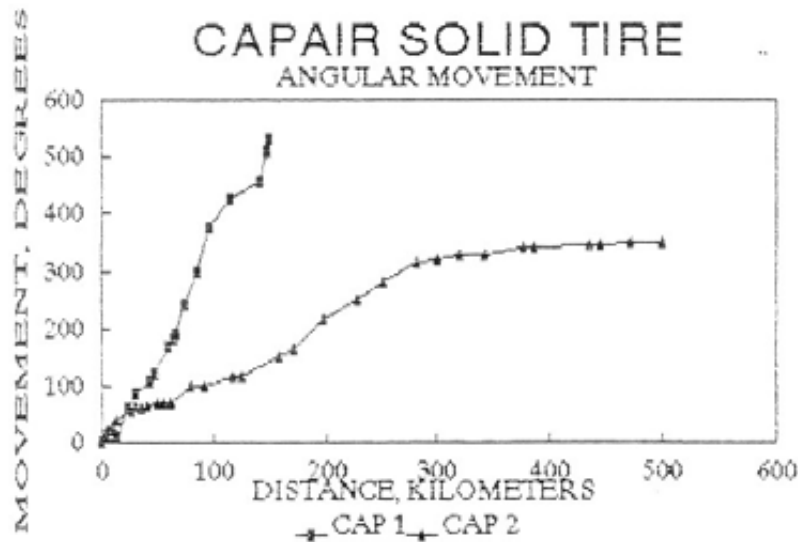
614-451-5617 (home)  
614-424-4009 (work)  
FAX 614-424-5263

August 7, 1992

Tadeusz Dziekonski - ul. Chrobrego 4 m. 8 - 15-057 Bialystok - POLAND

Dear Tadeusz,

Thank you for the calibration data in your letter of July 29. I also have observed that wet conditions produce strange calibrations. Have you begun to keep track of tire movement on your rim? Here is how mine is doing:



As for adding distance, I do it only when I know in my heart that I could have done better, and when I know someone else could find me short. In a 5 km course, a few metres has no significance to the runner, but is enough to protect a questionable measurement.

I once certified a 20 km course that measured 20100 metres. The race director wanted the start and finish in specific places, and the course used no turnaround point that could be shifted. An American Record was run on the course by Bill Rodgers.

I agree that it is best if courses are as accurate as we can make them, but occasionally problems arise that are not easily solved. Then we must do the best we can. Even when we have done our best, we rarely know the true length of the course better than 1/1000. We must be able to live with this, or we are playing the wrong game.

Best regards,

## Race director's notebook



By Jim Young

# Sure You Ran a Certified Course?

*Slips can happen after  
the measurer finishes*

A recent issue of a running club newsletter contained a letter from one of its members complaining about the distance run in a local race that advertised a TAC-certified course. The writer, an experienced runner, felt that the course was too long. He ended the letter with several questions.

"What is the responsibility of the race director if his TAC-certified course is too long on race day? Should he accept responsibility for the mistake? Should he blame race services? Should he ignore it? Should he have the race-day course measured and inform those who paid for an accurate course the exact distance run? What does TAC-certified mean?"

First, let us explain what actually happened in this case.

The course is a simple out-and-back L-shaped route. In this particular race, the race service hired was responsible for putting in the finish line and other individuals were given the job by the race director of putting down the starting line and the turnaround.

The cone crew knew that the turnaround was marked with a nail and paint, and they knew approximately where it was. Unfortunately, the street on which the turnaround is located is also the route of several other races and contains several turnaround marks.

The crew found what they thought was the proper location and placed the cones there. Later, after hearing several complaints, they reexamined the course and found another marked turnaround 85 yards away.

As a race director, I would feel responsible if my course was not the proper distance. To avoid such an incident, I personally go out with the TAC certifier when the course is measured and draw all the sketches and course maps myself.

In a nutshell, "TAC certified" means that the course has been measured by someone qualified as a measurer. The course has been measured to 1/10 of 1 percent longer than it is advertised, i.e., a 5,000-meter course is measured as if it were 5,005 meters.

The course has been measured twice and the difference between the two measurements must be within certain limitations or the course is measured a third time.

Nails are placed at the start, finish, and any turnarounds to mark those locations. Mile marks and other key places on a course are marked in the same way.

Sketches are made of all those locations, which include measurements taken from fixed objects to the nail, i.e., fire plugs, sewer covers, telephone poles, etc. If the road is paved over after the course is marked, the start (finish, turnaround) can be relocated using these sketches without having to measure the entire course again.

Once the measurements, course maps, and sketches are approved by the local TAC certifier, a course certificate is issued.

After I submit the paperwork, I design a course plan. In conjunction with the police, I plan where the monitors will be stationed and where the cones and barricades will be placed.

I go out on the course and mark with spray paint where every single cone and barricade will go. Finally, I write up a 3-4-page course plan and send it to our course chairperson.

After a few days, I will meet with the chairperson out on the course and go over everything -- time tables, placement of monitors, placement of cones and barricades, etc.

On race day, I place myself in the lead vehicle and personally inspect the course to be sure everything is properly placed.

In the race in question, the individuals placing the cones did not have a copy of the sketch of the turnaround area. If they had, the error would not have occurred.

Now, to answer the letter writer's questions.

If a course is not run as it was certified, I feel the race director owes the runners an apology and should accept the responsibility for the mistake.

Should the race service be blamed? Yes, they would also be "guilty" if they were hired to lay out the course. However, most of the races that hire a service give it limited responsibility.

In my case, 80 percent of the time I am contracted to provide finish line and results services only. (In 1991, out of 40 races that contracted for my services, I was responsible for the course in only three of those.)

Should the course be remeasured and inform those who paid for an accurate course the exact distance run? I would, but that would be my personal preference. In the race results that are mailed out, I would explain what happened and, if possible, tell each runner the additional distance run.

What does TAC-certified mean? It means that the course has been properly measured. It does not guarantee that course run on race day is the one that has been measured.

THE ATHLETICS CONGRESS  
OF THE USA

3354 Kirkham Road  
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Peter S. Riegel, Chairman

614-451-5617 (home)  
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July 30, 1992

Running Journal - PO Box 157 - Greeneville, TN 37744

Dear RJ,

I enjoyed Jim Young's "Race Director's Notebook - Sure You Ran a Certified Course?" in the August 1992 issue of RJ. It brought back memories. Although I've directed a couple of races, I chose to make them 50 milers so I would not have a lot of people and complexity. My race directing expertise could not support handling a bigger event. I had no trouble seeing that the course was run as certified, since I myself had laid out and certified the course.

As a measurer I have laid out certified courses for other race directors. Some of these races I ran, some I did not. Of those I ran I saw to my dismay some occasions of misplaced turnaround points, (5 miles became 5.26, 15 miles became 14.89) and some strange splits.

It is easy to blame race administration for these errors, and indeed most of the time they did get it wrong. However, course measurers are not immune from error. In laying out a marathon the locations of start, finish, every mile and 5 km point, and the half, are usually marked on the road and described in detail in a list which is given to the race director as part of the certification documentation.

I've measured the Columbus Marathon 5 times over the last 8 years, as the locations of start and finish have changed to accommodate the desires of sponsors and organizers, and to respond to suggestions for improvement made by runners. The basic cloverleaf shape of the course has remained the same. Each time I do this a completely new set of marks must be laid down and described - 37 separate points for the marathon.

Last year the 5 mile split was misplaced by a few hundred feet, because the volunteers got to the general area, found a "5" on the road, and assumed it was correct. Actually, it was the 5 mile mark from a former race. The runners noticed this, and I felt bad about it because it reflected on me. The error could have been avoided if I had made more of an effort to make the road markings distinctive, instead of using my habitual white paint.

This year I marked each split with white paint, as always, but put a yellow stripe next to each split. Only a white number and a yellow stripe is valid for the current course. If the course changes next year I will do the numbers themselves in yellow. In fact, because I measure a number of courses I will adopt a different color code for each succeeding year. This should reduce the possibility of error.

Getting the course right is very important, but people are only human, and mistakes are inevitable. I agree with Young that when an error occurs it's

desirable for the race organization to let the runners know what happened, and give them the information they need to accurately assess their performance. Publishing the actual length of the race as run is one way to do this. Another thing that's appreciated is to prepare a chart showing the projected finish time for the certified distance, based on the runner's finish time for the race as run. If the error involves only a misplaced split, the runners should be told of this as well, and assured that the overall course was OK. This will help allay runner concerns as to course accuracy. A bum split causes the runner to doubt the accuracy of the whole course.

Runners can check the accuracy of race-day layout for themselves if they wish. TAC keeps a copy of the certificate and course map for every certified course - over 10,000 of them at last count. Copies of these, as well as lists of certified courses, are available for a nominal fee. Runners wishing information about this may contact me.

Best regards,



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#### MAP OF THE MONTH

Every once in a while Joan finds an extra-nice map among the current submissions, and from these is selected the Map of the Month. We do not make a big thing out of it. The judging process is neither fair nor impartial. The main goal is to get an example that embodies what we should strive for in making a course map. We recognize that the map selected may not be the absolute best that the two-month period has to offer.

If you are a certifier, and think you have a good one, put a sticky note on it when you send it to your Vice Chairman. We will give nominated maps precedence over our own selections, most of the time.

If we were to give Map of the Month honors strictly on the basis of quality, the same people would repeat, month after month. We have a few really superb mapmakers in our number, and selection of another map is no reflection on them. It is important to recognize a good map, even if the measurer's artistry is not perfect.

If you're a measurer, and think you've produced a really good one, mention it to your certifier when you send in the measurement package.

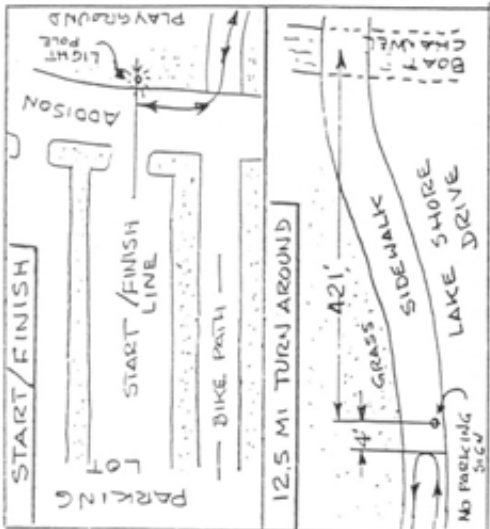
#### COVER PHOTOS NEEDED!

"Pete must be pretty hard-up to use such a lame tourist photo for this month's cover." I can hear it. The truth is I am usually pretty desperate for something to put on the cover. This is an appeal for readers to send in something relating to measurement. If you don't send me something I will either quit doing the cover photo entirely or maybe show a picture of some measurer's grandchildren or dog.

1L-92049-JW

ANYTHING WITH WHEELS  
2, 5, 10, AND 25 MILE COURSES

— DETAILS —



**COURSE:** Course is entirely on the bike path along Chicago's lakefront except for 50 ft. at the start & finish. It is measured along the yellow median stripe which identifies the path. Where there is no stripe the measurement was the shortest possible route. The start/finish line and all mile points are marked with white spray paint.

**START/FINISH** - On Addison east bike path and even with the light pole on the south side of street opposite the west parking lot lane.

**MILE 1 & 24** (2 mile turn around) - 32 ft. south of grating drain on east side of Lake Shore Dr. which is 40 ft. south of 3rd light pole south of the Barry underpass.

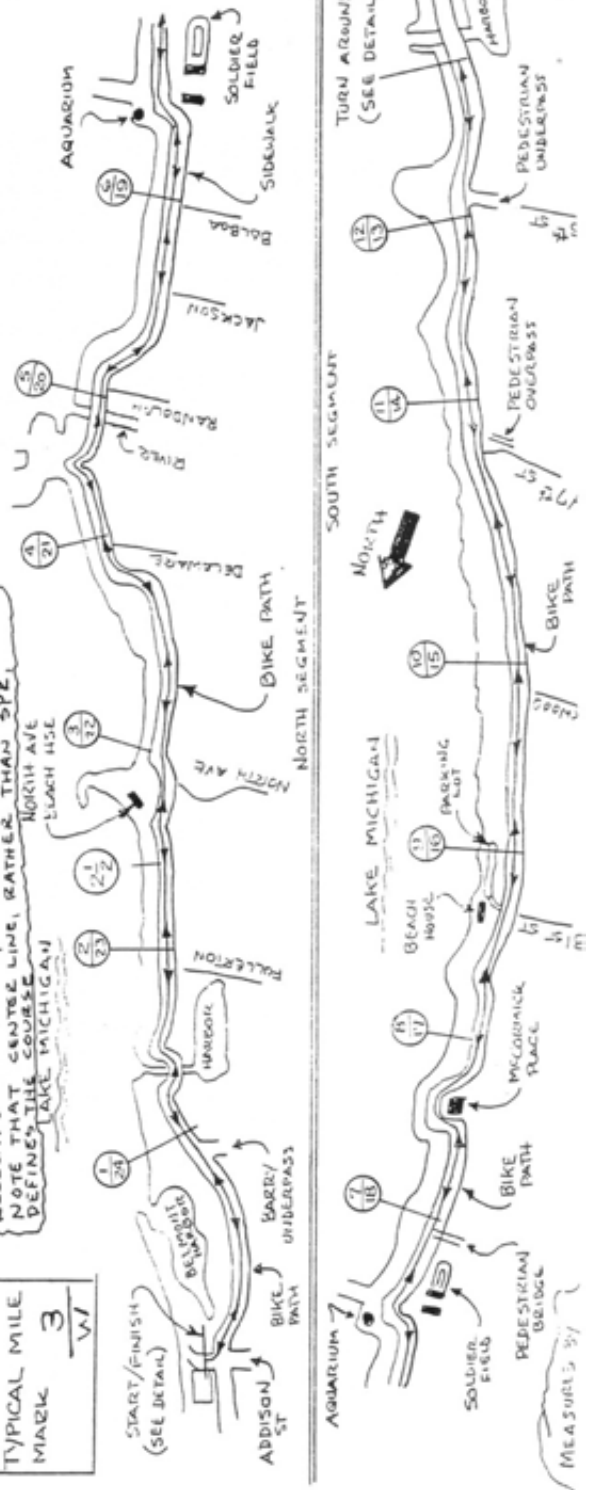
**MILE 2.5** (5 mile turn around) - 15 ft. south of 5th light pole north of North Ave Beach House. Pole has "6 mi. bike route" sign on it.

**MILE 5 & 20** (10 mile turn around) - 11.5 ft. south of 4th light pole north of pole with RANDOLPH ST sign on it.

**MILE 12.5** (25 mile turn around) - 4 ft. north of post with no parking sign. Post is mounted on sidewalk and is 421 ft. south of center of bridge over channel to north Jackson Park harbor.

MAP OF THE MONTH - THIS COURSE IS USED BY RECREATIONAL BIKERS, ROULETTEBLADES & RUNNERS. NOTE THAT CENTER LINE, RATHER THAN SPE, DEFINES THE COURSE LAKE MICHIGAN

TYPICAL MILE MARK  $\frac{3}{W}$



MEASUREMENT BY

## THE ATHLETICS CONGRESS OF THE USA

Road Running Technical Council  
Bob Baumel, OK, SD Certifier

129 Warwick Road  
Ponca City, OK 74601  
405-765-0050 (home)  
405-767-5792 (work)

1992-08-02

Wayne Nicoll – Ragged Mountain Club – Potter Place, NH 03265  
Re: “Skinny” Tapes

Dear Wayne,

This is a delayed response to a letter you sent Pete and me six months ago. That letter discussed a tape measurement by Cedric Stratton of Savannah GA and included the observation by you: “In fact, I better understand why the Japanese ‘skinny’ tapes require significantly less tension on them.”

I’m sorry I was too busy to respond to your letter at the time, but I really can’t let this pass without comment. The fact that you still apparently believe in this notion about “skinny” tapes suggests that you may not have noticed the comments about tape tension in my metric tape article last year (see July 1991 *Measurement News*, pp. 15–17) where I thought I clearly showed the fallacy in the “skinny” tape idea. To make this clearer, and tie it in with Mr. Stratton’s measurements, I’d like to make three points:

- 1) It is **not** true that “skinny” tapes (made in Japan or elsewhere) require less than standard tension. (The emerging international standard for steel taping appears to be 50 newtons, equivalent to about 5 kilograms-force or 11 pounds-force.) Some confusion has apparently existed among certain importers of Japanese tapes who claimed **incorrectly** that they require only 20 N ( $\approx 2$  kgf  $\approx 4.4$  lbf). The particular tape used by Cedric Stratton was apparently just **out-of-spec** (which makes one wonder how many other tapes we use are out-of-spec).
- 2) There’s no doubt that a lighter weight tape stretches more for any given applied force than a heavier tape. But this doesn’t mean that light tapes should be used with less tension than heavy tapes. It means only that when using lighter tapes, it’s more important to apply the **correct** tension. Often, the correct tension is marked directly on the tape blade (see Figure 1).
- 3) I am a little suspicious of Mr. Stratton’s micrometer measurement of his tape, as it indicates this particular tape to be lighter (and therefore more stretchy) than any tape I’ve ever checked. Instead of measuring the tape with a micrometer, you can probably get a more reliable indication by *weighing the tape*.

I will now expand on these points a little: First, there are US government standards for steel tapes, which Pete Riegel obtained back in 1983, only a few months after he and I began corresponding about measurement. The standards Pete uncovered (dating to 1968 and 1976) specify identical accuracy requirements for both surveyor’s tapes and “general use” steel tapes: namely, accuracy to 1 part in 12000 at tension of 10 lbf ( $\approx 4.5$  kgf  $\approx 45$  N).

These standards presumably apply to manufacturers who sell tapes to the US government, although other tape makers wishing to abide by these standards are free to do so and advertise the fact. For example, the tape depicted in Figure (1b) (which I purchased in New Zealand in 1985) was sold in packaging displaying the statement: “The blade in this tape conforms to all United States Government Specifications for accuracy.”

Possibly, this US government standard has changed since 1976. Internationally, the round metric figure of 50 N ( $\approx 5 \text{ kgf} \approx 11 \text{ lbf}$ ) seems to be taking over as the standard tension for steel taping. Figure 1 shows tapes made in three different countries. The tapes in (1a) and (1c) have tension marked in the correct SI unit, newton (N), while the tape in (1b) displays tension in the older non-SI unit, kilogram-force (denoted incorrectly as "Kg" on this tape). But all three tapes indicate essentially the same tension value of 50 N.

Note on units: In the modernized metric system ("SI" for *Système International d'Unités*), the kilogram (kg) is used only as a unit of *mass*, while the newton (N) is the unit of force. Some older, pre-SI, versions of the metric system included the (now-obsolete) force unit "kilogram-force" (which I denote "kgf"). I would prefer to specify forces only in newtons, but since you're more likely to find spring balances graduated in kilograms than newtons, it's handy to know that 1 kgf is about 10 N. (For exact conversion factors, see table at end of this letter.)

Figure (1a) shows a Japanese-made tape of precisely the sort that you probably call a "skinny" tape. (I expect that it's very similar to your Japanese-made 200 ft tape.) In fact, as shown in Figure 2, this tape is sold in a plastic bag with an imprinted "Correction Chart" implying that the correct tension is only 4.4 lbf ( $\approx 2 \text{ kgf} \approx 20 \text{ N}$ ). However, the table on this plastic bag is **wrong**. Figure (1a) shows that the tape blade itself is marked with a "50 N" figure. As described in my July 1991 article (page 16), I "calibrated" this tape by checking it on a stretch of road measured by EDM. I found that this particular tape is **really** most accurate when pulled with about 60 N tension!

The tapes in figures (1b) and (1c) are typical of hardware-store steel tapes and are *even lighter* than the Japanese "skinny" tape in (1a). But each of these tapes is also marked with a 50 N (or 5 kgf) tension figure. Actually, the particular tape in (1b) was used by a measuring team under your direction during the June 1990 IAAF Seminar in Columbus, OH. I learned afterward from Bernie Conway, who was a member of that team, that you directed them to use only about half the tension marked on the tape. (Apparently, neither you nor he nor anyone else on that team noticed the tension figure marked on the tape.)

Obviously, as indicated by the incorrect table in Figure 2, some importers of Japanese-made steel tapes have suffered from a delusion that these tapes require a tension of only 4.4 lbf ( $\approx 2 \text{ kgf} \approx 20 \text{ N}$ ). In my July 1991 article I noted that according to the Lufkin catalog, this is really the correct tension for **fiberglass** tapes rather than steel tapes. It's possible that in the early 1980's, some Japanese manufacturers got confused and began using this standard fiberglass tension for their new lightweight steel tapes. If so, they probably soon caught their error, so that all steel tapes now made in Japan conform with the international 50 N tension standard.

It is sometimes stated that US-made surveyor's tapes longer than 100 ft require an extra strong pull of 20 lbf ( $\approx 9 \text{ kgf} \approx 90 \text{ N}$ ). However, according to the Lufkin catalog, this applies only to "surveyor's tapes of heavy gauge steel." It certainly doesn't apply to the 60 m tape in Figure (1a), which is clearly longer than 100 ft, but takes internationally standard 50 N tension.

I find your use of the term "skinny" tape ambiguous. Does "skinny" refer to the tape's width or its thickness? Actually, neither of these numbers, considered alone, is important. The tape's "stretchiness" is determined by its *cross-sectional area*, which is the *product* of width and thickness.

Direct measurement of a tape's cross-sectional area is difficult because it's hard to



measure the thickness accurately. It's much easier (and probably more reliable) to get this information by *weighing* the tape and then calculating its "linear density," which I like to express in grams per meter (g/m). Converting between a tape's cross-sectional area and its linear density is easy, knowing that the steel used in measuring tapes has density 7.85 g/cm<sup>3</sup>.

According to surveying textbooks, surveyor's tapes are classified as ranging from "lightweight" with linear density about 15 g/m (1 lb for 100 ft tape) to "heavyweight" with linear density 45 g/m (3 lb for 100 ft tape). Note that in Figure 1, I've included the measured linear density for each of the pictured tapes. The Japanese-made tape in Figure (1a) weighs 14.3 g/m and thus qualifies as a "lightweight surveyor's tape" (about 15 g/m). The hardware-store tapes in Figures (1b) and (1c) weigh only about 10 g/m, which is 2/3 the weight of a "lightweight" surveyor's tape.

By the way, I wrote an article on taping a track in June 1986 *Measurement News* (pp. 11–19), where I used both 30 m and 50 m tapes. The 30 m tape used on that occasion was precisely the one shown here in Figure (1b) with linear density 10 g/m. The 50 m tape weighed 25 g/m, thus qualifying as a "medium-weight surveyor's tape." Unfortunately, I no longer have that 50 m tape because it got broken during a measurement in January 1990.

Knowing a steel tape's linear density in g/m, its "stretchiness" can be calculated very easily using a formula presented in my June 1986 article. Specifically:

$$\text{Change in Length (cm/km)} = \frac{4.0 \times [\text{Change in Tension (N)}]}{\text{Linear Density (g/m)}} \quad (1)$$

For example, if you have a medium-weight surveyor's tape weighing 25 g/m, and you change the applied tension by 50 N, its length changes by about 8 cm/km (which amounts to 4 mm in a 50 m tape length, or 2.4 cm in a 300 m calibration course). If you have a hardware-store tape weighing only 10 g/m, the same 50 N tension change results in a 20 cm/km length change.

Note that Equation (1) refers only to **Change** in length and **Change** in tension. It doesn't tell us the tension at which any tape is most accurate. (That depends on how the tape was manufactured.) The equation does tell us that using the *wrong* tension produces a more serious error with a light tape than a heavy tape. For example, if you use a light tape and you apply **too little** tension, the calibration course you lay out will be significantly **shorter** than if you made the same tension error with a heavy tape.

Cedric Stratton, in one of his calculations, assumed that a tape would be most accurate when unstretched (or minimally so). That assumption is incorrect, as no steel tapes are intentionally manufactured to be correct at zero (or minimal) tension. Remember that the tiny tension figure of 20 N ( $\approx 2 \text{ kgf} \approx 4.4 \text{ lbf}$ ) is intended only for *fiberglass* tapes—not steel tapes. Note also, as reported in my July 1991 article, that when I tried applying that tiny 20 N tension to the tape shown in Figure (1a), it *felt* totally inadequate because it wasn't enough to overcome friction with the road.

The particular (Stanley) tape used by Mr. Stratton, as checked by the Corps of Engineers, has a length of 100.04 ft at 10 lbf tension. That's an error of one part in 2500, which is *way* outside the US Government tolerance (one part in 12000). Because it's so excessively oversized, *this particular tape* would be more accurate if used with a lot less tension. Of course, this in no way implies that steel tapes *in general* should be used with less tension!

Turning to Mr. Stratton's specific calculations, he found that this tape with length 100.04 ft at 10 lbf tension would have a much more accurate length of 100.01 ft if



used with zero tension. Those calculations are essentially correct (even if I don't like his choice of units), given his measured dimensions of the tape. The weakest link is his micrometer measurement of the tape thickness.

Mr. Stratton's stated tape dimensions—0.00315" (0.08 mm) thick by 0.375" (9.5 mm) wide—imply a linear density of 6.0 g/m. Using this figure, I can verify his stretching calculations with Equation (1) above. However, 6 g/m is a lot lighter than *any* tapes shown in Figure 1. A check of the Lufkin catalog reveals that the lightest steel tapes sold by that company (specifically, their "Home shop" and "Universal lightweight" models) match the 10 g/m density of the tapes in Figures (1b) and (1c). Maybe Stanley sells lighter steel tapes than any sold by Lufkin. I don't know.

Two questions arise concerning the micrometer measurement of tape thickness: (1) What's the resolution of the micrometer? (2) Is it possible that in removing the paint from the blade, some of the steel was also scraped off? I don't necessarily disbelieve this micrometer measurement, but it would be interesting to see it checked by direct weighing of the tape.

Note that if this tape, with length 100.04 ft at 10 lbf tension, really weighs 10 g/m (as is typical of hardware-store tapes), then its length at zero tension would be 100.02 ft. Thus, even if used with zero tension, the error would significantly exceed the 1/12000 Government tolerance.

In any case, there's no doubt that this particular tape is way out-of-spec. I don't have much personal experience with Stanley tapes, but I do recall one instance when I compared a friend's Stanley tape with one of my tapes—with the result that this Stanley tape also appeared to be oversized. While it's hard to generalize from two examples, it may be that Stanley tapes often fail to meet the Government standard. If it's true that these tapes usually run long, then it's safe to use them for laying out calibration courses in ordinary certification situations, but not validation situations.

This raises an important question: Unless we are willing to spend the extra effort to calibrate all our tapes (as Mr. Stratton evidently does), when can we feel confident that our tapes meet the Government standard? I'm pretty sure that all of Lufkin's tapes meet the standard, as that company is strongly committed to accuracy. More generally, I expect that any tape with a tension figure marked on its blade (like all the tapes in Figure 1) can probably be trusted to be reasonably accurate at the indicated tension. I would hazard a guess that the Stanley tape used by Mr. Stratton does *not* include such a tension marking on its blade.

My main purpose in this letter has been to debunk the "skinny" tape fallacy. Lightweight steel tapes do *not* require any less tension than standard tapes. But failure to use the *correct* tension produces a bigger error with a light tape than a heavier tape.

Best regards,

*Bob Baumel*

Bob Baumel  
cc: Riegel, Stratton

**Note on Force Conversions:**

1 kilogram-force (kgf) = 9.80665 N (exactly)  
1 pound-force (lbf) = 4.44822 N

1 newton (N) is the force that imparts a 1 m/s<sup>2</sup> acceleration to a 1 kg mass.

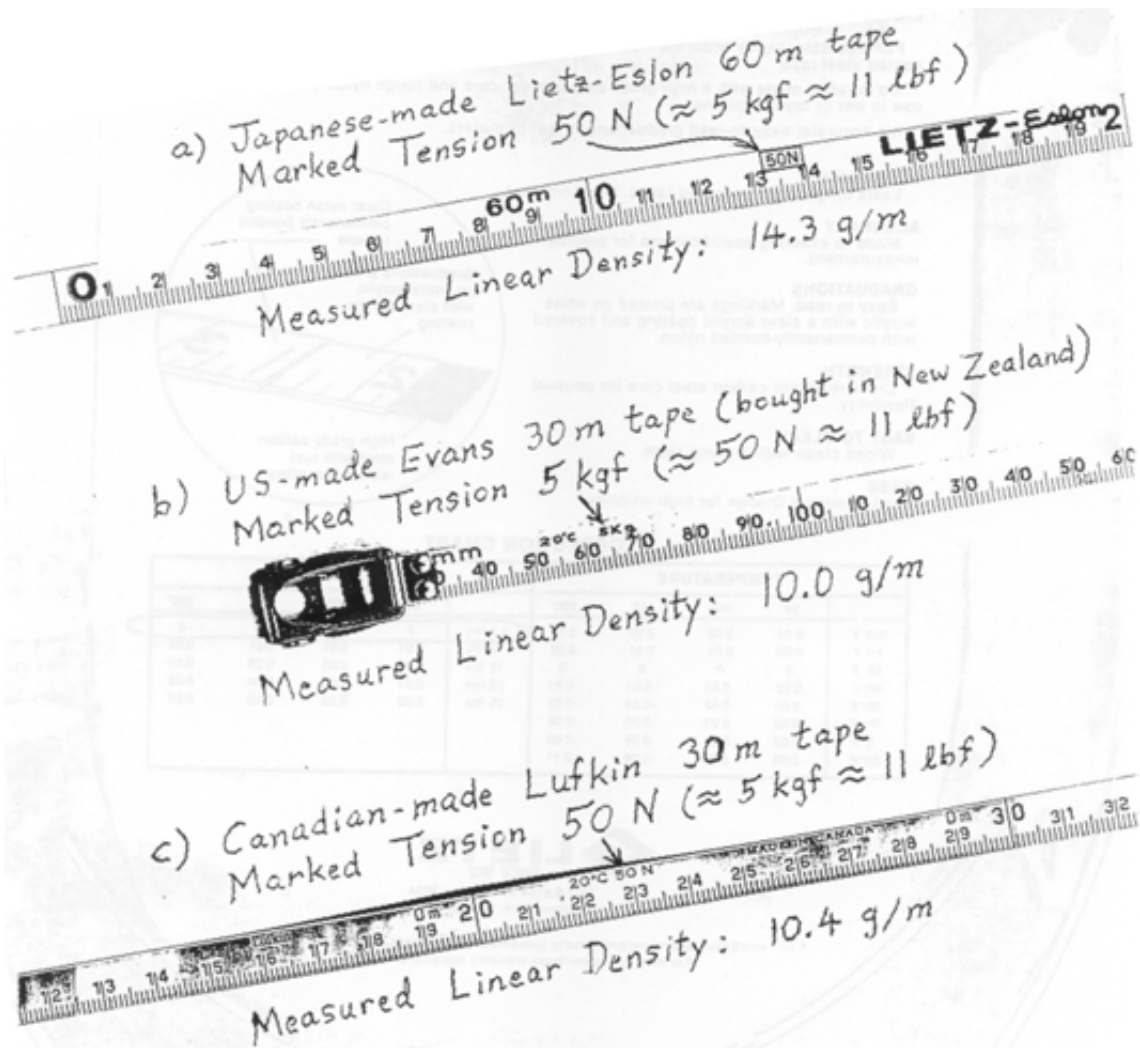


Figure 1. Pictures of several steel tapes (near zero end). In each of these cases, specified tension for pulling the tape is marked on the blade.

## LIETZ/ESLON NYLON-COATED STEEL TAPE

For a durable, highly accurate measuring tape, you can depend on the Lietz-Eslon nylon-coated steel tape.

It's durable: made with a high grade carbon steel core and tough nylon coating for years of use in wet or dry conditions.

It's accurate: easy-to-read graduations in feet or meters.

### DURABILITY

Lasts longer than uncoated tapes. Non-corroding.

### ACCURACY

Made to exacting specifications for precise measurement.

### GRADUATIONS

Easy to read. Markings are printed on white acrylic with a clear acrylic coating and covered with permanently-bonded nylon.

### STRENGTH

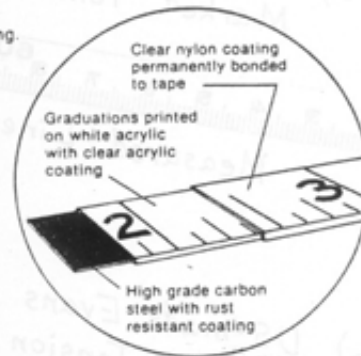
Crack-resistant carbon steel core for unusual flexibility.

### EASY TO CLEAN

Wipes clean with a damp cloth.

### CASE

International Orange for high visibility.



### CORRECTION CHART

	TEMPERATURE				TENSION			
	50'	100'	165'	200'	50'	100'	165'	200'
110°F	0.01	0.02	0.03	0.04	4.4 lbs	0	0	0
100°F	0.00	0.01	0.01	0.02	10 lbs	0.01	0.01	0.02
90°F	0	0	0	0	15 lbs	0.01	0.02	0.03
80°F	0.00	-0.01	-0.01	-0.01	20 lbs	0.01	0.03	0.04
70°F	0.01	-0.02	-0.03	-0.03	25 lbs	0.02	0.03	0.05
60°F	0.02	-0.03	-0.05	-0.06				
50°F	0.02	-0.04	-0.06	-0.09				
40°F	-0.03	-0.06	-0.08	-0.11				



SINCE 1882  
9111 Barton Street, Box 2934  
Overland Park, Kansas 66201

Lietz-Eslon tape is unconditionally guaranteed for one year from date of purchase.  
For details, see enclosed warranty registration card.

Figure 2. Plastic bag used for packaging Lietz-Eslon tape (see Figure 1a). Table indicates tape is correct with tension of only 4.4 lbf (= 2 kgf = 20 N). But marking on tape blade (Figure 1a) specifies 50 N tension. By comparing against EDM, I determined that this particular tape is most accurate with 60 N pull.

THE ATHLETICS CONGRESS  
OF THE USA

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Columbus, OH 43221

Road Running Technical Council  
Peter S. Riegel, Chairman

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

August 7, 1992

Bob Baumel - 129 Warwick Road - Ponca City, OK 74601

Dear Bob,

I enjoyed reading your "Skinny" Tapes letter. I'll begin with my own experience with one:

I bought a 100 foot Leitz nylon-clad steel tape from Watts Engineering, in spring 1984. Harley Watts, old-time surveyor, was interested in what we did, and after we talked about road course measurement for a while he trotted out a 100 foot tape that had been certified at 100.001 ft by NBS 30 years before. He did not use it for survey work, only to check new tapes as he got them. We did a side by side pull of his tape and my new Leitz. Here is what we got:

<u>Observed readings over same measured length:</u>	
NBS certified tape with 10 lb pull:	100.00 ft
Leitz tape with 4.5 lb pull:	99.99 ft

A week before I had checked the Leitz against my Lufkin 100 footer, and got:

Lufkin at 10 lb pull:	100.00 ft
Leitz at 4.5 lb pull:	100.00 ft
Leitz at 10 lb pull:	99.99 ft

From this it looks like 4.5 lb is the correct pull for my Leitz, since at that pull it is 0.01 ft longer than standard. With a 10 lb pull it would be 0.02 feet longer than standard, which is outside specification limits. My Lufkin looked OK (moot, since it has since been run over and broken).

My Leitz tape has a very thin steel ribbon encased in a fat nylon covering. The cross-section of the steel cannot be determined by weighing, since the mass of nylon is significant (I'd guess it weighs more than the steel). On regular steel tapes I would guess that scraping off the paint and miking the steel is as good a way as any to get the size. The paint has weight, but weighing a regular tape is probably a good way too.

I think your assertion that "skinny" tapes use the same tension as others is probably correct, but I'd be extremely wary of going against a manufacturer's recommendation. My Leitz has a steel ribbon that is approximately 3 mm wide, and I can only guess at its thickness. Its finished dimensions come from the nylon covering, which is about 8 mm wide. It is very flexible. This is definitely a different animal from a painted ribbon of steel. It is not at all like your figure (1a).

I would have to see the method used by the Corp of Engineers used to check Stratton's tape before I would buy the idea that it is off by 0.04 feet in 100

feet. The testing may have been rigorous, or he may have just got a word-of-mouth comparison with something from a buddy. I don't know, and until I do I remain skeptical that Stratton's tape is really 100.04 feet long under standard conditions.

My 1 inch micrometer has a least count of 0.001", and it is about 3 mm between least-count divisions, which means I can estimate to 0.0001 or 0.0002 inches. Micrometer error is not very significant in measuring .003". I have to admit that seems awfully thin for a tape. As for scraping the paint removing steel, I doubt that happens enough to make any significant difference. Any removal would be a local depression, and the general thickness would remain, unless a grinder was employed to do the job.

#### SERMON

I believe we have put too much emphasis on accurate steel taping. I have found that people rarely follow the instructions to the letter, and get confused a lot on the temperature correction. People still announce with relief that they were able to get a surveyor to lay out a cal course for them. This tells me that we have made a mountain out of a molehill. All the business with fineline pens, masking tape, force gauges and thermometers just makes a daunting task out of something that is quite simple.

Most people, without any instruction at all, can use a tape to establish a length. It is not a hard thing to understand, but by the time we are through telling people how to do it right they are petrified. I think we may actually cause inaccuracy by complicating a simple process.

Part of the reason we do this may be that we, the leaders, like things as accurate as we can get them. It's technically satisfying. In course measurement, however, the inaccuracy inherent in the bike method is an order of magnitude greater than the errors in taping, and super-accurate taping is not really required. It would be a rare thing to be able to detect a slightly inaccurate calibration course by using a bike and counter. Pavement differences alone overwhelm taping inaccuracy.

We could easily back off on calibration course layout procedures. There are only two significant sources of error. The first is miscounting the number of lengths, and the second, smaller one, is failure to use the proper zero point. We can catch the first one with a bike check, but we have never had a way to check the second, except to use a different type of tape to check.

Our validation stats show that we are achieving good success in having courses come out not short. The SCPF and larger constant easily cover the small errors in calibration course layout. If we worry about injustice on the validation side, it is only because the negative validation allowance of 5 m in 10,000, which we presently use, is not always all that convincing.

In the next revision to the measurement book, I think a simplification of taping procedure would be a step in the right direction. I would be astounded if relaxing on the calibration course taping procedure resulted in a measurable change in validation results.

Best regards,

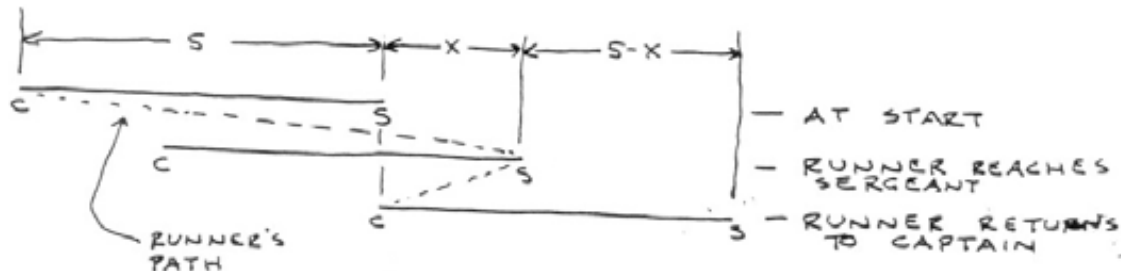


xc: Wayne

## LAST MONTH'S PUZZLE

A column of soldiers marching along is exactly 5 miles long. There is a Captain at the back, and a Sergeant at the front. The Captain sends a runner to the Sergeant with a message. The runner reports back to the Captain just as the Captain reaches the point where the Sergeant was when the message started out. The runner lost no time delivering the message. The runner's rate of speed and that of the column is constant. How far did the runner run?

THE ANSWER:



LET  $V_C$  = SPEED OF COLUMN  
 $V_R$  = SPEED OF RUNNER

RUNNER

FROM C TO S:  $\text{Time } \textcircled{1} = \frac{5+X}{V_R} = \frac{X}{V_C}$  ,  $5V_C + XV_C = XV_R$  (

FROM S TO C:  $\text{Time } \textcircled{2} = \frac{X}{V_R} = \frac{5-X}{V_C}$  ,  $XV_C = 5V_R - XV_R$  (

ADDING  $\textcircled{1}$  TO  $\textcircled{2}$  YIELDS:  $(5+2X)V_C = 5V_R$  OR  
 $V_R = \frac{5+2X}{5} V_C$  (

SUBSTITUTING  $\textcircled{3}$  IN  $\textcircled{1}$  YIELDS:

$$5V_C + XV_C = X \left( \frac{5+2X}{5} \right) V_C$$

$$25 + 5X = 5X + 2X^2$$

$$2X^2 = 25 \quad X^2 = 12.5$$

$$X = \sqrt{12.5}$$

SINCE THE RUNNER RUNS  $5+2X$ , HE RUNS  $5 + 2\sqrt{12.5}$

$$= \underline{\underline{12.07 \text{ MILES}}}$$

BRIAN SMITH GOT IT RIGHT. SEE NEXT PAGE.

July 7 92

Pete:

How about

12.07106876373291 miles

for the column of soldiers problem?

MILES RUN	A	B
12.07106113433838	3.535530567169189	3.535534620285034
12.0710620880127	3.535531044006348	3.535534381866455
12.07106304168701	3.535531520843506	3.535534381866455
12.07106399536133	3.535531997680664	3.535534381866455
12.07106494903564	3.535532474517822	3.535534381866455
12.07106590270996	3.535532951354981	3.535534381866455
12.07106685638428	3.535533428192139	3.535534381866455
12.07106781005859	3.535533905029297	3.535534143447876
12.07106876373291	3.535534381866455	3.535534381866455
12.07106971740723	3.535534858703613	3.535534143447876
12.07107067108154	3.535535335540772	3.535534143447876

```
10 FOR A=#12.07106 TO #12.07107 STEP .000001
15 LPRINT CDBL(A);
20 B=A-5
30 C=B/2
40 D=(5+C)/A*100
50 LPRINT CDBL(C);
60 E=D*5/100
70 LPRINT CDBL(E)
80 NEXT
```

A = the number of miles plus 5 the runner would do a 180° turn in order to run the total distance indicated. B is the point the sergeant would be at that time. When A = B the total is known

Brian

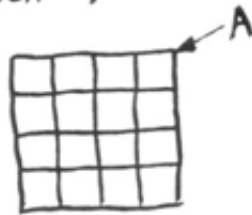
BRIAN SMITH SC

Pete:

These problems are relatively easy. You may wish to use all three for one month

- ① TWO BEACH BALLS ON THE BEACH (OF COURSE) TOUCH ONE ANOTHER AT ONE POINT. THE BEACH IS LEVEL & FLAT. THE BALLS ARE PERFECT SPHERES, ONE 12" DIAMETER, THE OTHER 8". AT WHAT VERTICAL DISTANCE ABOVE THE BEACH DO THEY TOUCH?

②



THIS MONTH'S  
PUZZLES  
GO FOR  
THEM!

ALL THE ABOVE ARE SQUARES. YOUR ONLY TOOLS ARE A PENCIL & A STRAIGHT EDGE. DRAW 2 LINES THROUGH POINT A SO THAT THE WHOLE SQUARE IS DIVIDED INTO 3 PARTS OF EQUAL AREA

- ③ A PIECE OF STRING IS WOUND AROUND A CYLINDER STARTING AT ONE END. THE STRING IS 12" LONG. THE CYLINDER IS 2" IN CIRCUMFERENCE AND THE TURNS OF STRING ARE 1.5" APART. HOW FAR UP THE CYLINDER WILL THE STRING REACH?





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July 23, 1992

Dick Raskind - Cullinan Engrg Co - 210 Lincoln St - Boston, MA 02111

Dear Dick,

Your inquiry about track layout ignited a desire on my part to see if I could produce a standard drawing of a 400 meter track. The one I sent you, from USTC&TBA, was inadequate for your purposes, in my view.

I rapidly learned that there is a good reason why such diagrams do not exist. Tracks may have many different curve radii, and in addition have varying lane widths (1.22 to 1.25 m). This means that each track is a special job. The only thing they have in common is a 400 meter length of the measure line of lane 1.

In addition, the marks on a track depend on how each event is run. I searched through the TAC rule book to find all the rules relating to how the various events are run on a 400 meter outdoor track. I found:

- 1) 100, 200 and 400 meters, and all hurdle races, are straightforward, all being run in lanes. Starts are offset depending on the amount of curve and the lane widths.
- 2) 800 meters is run in lanes until the end of the first turn, at which a "break line" is encountered, after which the runners have the full use of the track. Starts must be offset depending on lane width, curve radius, and the configuration of the break line, to provide an equal course length for each competitor.
- 3) Races of 1500 meters or more, including steeplechase, are begun from a starting line that is equidistant from the finish line over its entire length. The shape of this line is an involute curve, which is difficult to describe to the layman and is even a head-scratcher for a some technical people. Fortunately there are approximations that suffice to substitute for the true involute.
- 4) The measure line lies 30 cm from curb or 20 cm from the outside of the inner lane boundary stripe.
- 5) Lines on tracks have a width of 5 cm.
- 6) Lane width extends from the outer edge of the inner lane line to the outer edge of the outer lane line.
- 7) 4x200 relay: First two legs are run in lanes, plus the third turn. Then the runners have the full use of the entire track.

8) 4x400 relay: First leg is run in lanes, plus the third turn. Then the runners have the full use of the track. If only 2 or 3 teams are competing, only the first turn should be in lanes.

9) Hurdle spacing for men's 110 and 400 meter races, and women's 100 meter hurdle races is specified in TAC rule 120.

10) In relay races, there is a take-over zone extending 10 meters each way from the start of the next leg.

The above is all I was able to glean from the TAC rulebook. I think I will go next to the IAAF rulebook, but I expect I'll find much the same thing.

The track layout surveyor must determine the end radii of the curves, and the distance between centers, plus the lane width desired. With this known, plus the above information, each lane becomes a separate design problem.

The surveyor should also find out whether there are any special races that may be run on the track, since marks may be needed for these.

I am not sure whether a "standard" 400 meter track is evolving. Part of the problem is that tracks generally enclose a playing field of some sort, so geometries will vary.

In any case, I have abandoned my project of producing a track layout drawing. I suspect I would find an actual track layout to be an interesting exercise.

Best regards,



---

#### BLOOD DOPING

Decades ago, before I began running, I used to donate blood once in a while. After doing it a number of times I began to notice that I'd come down with a cold a week or two after I gave. Maybe it was only a coincidence, but I stopped giving.

A month ago the Bloodmobile was parked at work, and I was on my way in. On a whim I decided to give some blood. They took a bagful, and I went on to work. I felt no effect in my everyday activity, but my running was absolutely shot! I could not believe the effect. I felt leaden and listless on the road, and now, after a month has passed, I am finally running normally again.

I used to read about blood doping with some skepticism, but now, having tried it in reverse, I believe there must be something to it. If removing a pint makes such a horrendous difference, imagine gaining one!

By the way - I did not come down with a cold.

Has anybody else noticed a similar effect?

Tel No: 091 4153379  
Fax No: 091 4271880

29, Rookhope,  
Rickleton,  
Washington,  
Tyne & Wear,  
ENGLAND  
NE38 9HW

16th July 1992

Dear Pete,

Enclosed is my report and data sheets on the measurement of the Vardinoyannios Marathon, Heraklion, Crete. Copies of which I have sent to Ted Paulin and John Disley.

As often seems to happen, I feel that the organisers requested the course to be measured and certified long before the route had been agreed with the local authorities. The provisional course had been measured in a motor vehicle and as a result was 2,600 metres short of the required distance. It proved very difficult to find a course correction of this magnitude.

I have now measured a number of Marathons, and every assignment is different. Some race organisers do not appreciate the complex nature of the measurers work, whilst others are much more understanding and every request / instruction is obeyed without question.

In an effort to make my task a little easier, I send out a rough timetable of the measurement procedure. I am now wondering if it would be beneficial to all concerned, if a more detailed document of the "Course Measurement Requirements" could be published as a guide. A more ambitious objective would be a "measuring presentation" the next time there is a gathering of race directors, with the aim of creating a greater understanding of the role of the course measurer.

I am pleased to report that everything turned out well in the end. I was particularly pleased with the way I derived the course correction, although it had members of the organising team completely baffled. My only hope now is that the local police agree to the proposed route, and adequate steps are taken to ensure that the runners adhere to the measured route, particularly in view of the fact that there are four turn round points on the course.

Having just read your article Measurement News on the Carlsbad 5000 and the confusion on the location of the turnaround points, I thought it was rather ironic that I submit a measurement report with four such points.

I agree with your sentiments on "fully-defined courses", turnaround points should be avoided wherever possible or at least kept to a minimum. However, it is difficult to have an out and back course without a turn point. In situations where they are unavoidable, I think definite road features should be used such as a gap in the central reservation, traffic islands etc.

Race organisers in the U.K. are under increasing pressure from the police authorities to minimise the inconvenience to motorists on race days. As a result the number of out and back courses is set to increase. There now seems to be a conflict of interests between the race director who finds a turn around point a convenient way of appeasing the authorities, and the course measurer who wants to sleep soundly knowing the course to be run is the route he measured. The possible error due to a few mis-placed cones around an "S" bend or a road junction is of relatively little significance when compared to the catastrophe that could result from the incorrect location of a turn point.

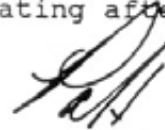
Returning to my recent experiences in Heraklion, Crete, two of the turn points are definite features. The others required additional measurements to fix their location, which were marked with survey nails and paint, but how do I know where the cones will be fixed on race day ?.

It's a risky business !. Or am I being alarmist ?.

I have never met such a bunch of impatient drivers as I did in Crete. Perhaps it was the inept performance of the policeman, but, it was almost inevitable that we would have an accident. This duly occurred when under great pressure from a car behind him my co-cyclist ran into the back of me. I manage to stay upright but my colleague took a tumble. It could have resulted in a serious injury but thankfully he survived with only grazes to his knees and elbows.

I finally managed to make it to the USA in June. As I planned we met up with Doug Loeffler and his wife, having a meal together and exchanging our measurement anecdotes. The occasion was marred somewhat when my son who had been happily playing in the hotel pool decided to "gate crash". Running through the plush Raddison Suite restaurant in his swimming attire seeking his parents for dollars. Quite an embarrassment !.

I did a rather foolish thing whilst in the States by running in two 5k road races in the space of twelve hours. I competed in Run America 5k at Tampa at 7.30 pm, and the Butterfly Run at Largo Mall at 7.45 am the following morning. These short races are a bit of a rarity in England, and I found it very difficult to pace myself. As a result I ended up running both events faster than I should, and having not experienced such humid conditions before, I was close to dehydrating after the second event.



Best Regards

Paul A. Hodgson  
AIMS / IAAF Course Measurer.

Saturday, July 18, 1992

Doug Loeffler  
5159 Majorca Club Dr.  
Boca Raton, FL 33486

Dear Doug,

Thanks so much for your thorough answers to my questions. It's a pleasure receiving instruction from a knowledgeable, experienced person such as yourself. I wish I had many more (significant) questions to ask, and many more courses to measure.

I do have some questions regarding verification rides. Robert Scott spoke with me yesterday after speaking with you the evening before. What I think is to be done (pending final approval of the race co-directors) is to relocate the Start of the Panama City Half Marathon (FL90036DL) in order to avoid expected congestion associated with a convention to be held over the weekend of November 21st. He relayed that two verification rides would need to be made between the Start and 1-mile split. If the verification rides check out ok then the start can be repositioned to another point (by the usual methods - calibrate, ride twice, calibrate, make adjustments, mark, measure to reference points, etc.) Regarding the verification rides, what are the allowable tolerances? I presume each ride must be within .08% of the other, but I'm not sure of the criteria for verifying the newly measured distance versus the distance measured on October 20, 1990. (Of the courses I've measured, I think this is the only one that I didn't go back and adjust the miles splits in proportion to the required lengthening distance for the course (2.82-ft added to the Finish).) Is the criteria that the shortest of the two verification rides be within .08% of 1-mile? Or is the criteria more stringent, say, that the shortest of the verification rides cannot be under 1-mile? Is the 1.001 safety factor used in the verification rides?

About 2½ months ago I was tapped to measure a course of a different color - a 1-mile swim. It was quite an experience dealing with the watery elements and other factors of uncertainty. It was to be kept simple, but not simply out and back (for collision avoidance). So, after much preliminary dry land planning, measurements, & surveys, and even a bit of computer simulation of expected courses (given error limits on distances and bearings), I designed the course to start on shore, proceed 200 yards at 34' (to first vertice of triangle), continue 1580 yards at 34', turn left (@ 2nd vertice), proceed 1900 yards at bearing 260.3', turn left (@ 3rd vertice), proceed 1400 yards at 135', turn left (@ 1st vertice), proceed 200 yards to finish at shore. The distances were measured by paying out shroud cord (marked at the desired lengths) from a boat. The approximate bearings were followed from the ship's compass. After adjustments were made, the as-marked course (buoys at vertice 1 & 2, sailboat at 3) was substantially as designed.

The swim race (held June 6) went off without a hitch. A small but enthusiastic crowd of about 32 swimmers took to the waters of Deer Point Lake right around 8 a.m. I was among them, and finished about midway in the pack with a time of 33:07 (about 5 minutes slower than I could do if I were in good training). Learned after the race that a 6-8 foot gator was sighted during the race by one of the canoeists marshalling the course. Happily for us humanoids in the water, it stuck to its characteristic nature by avoiding us.

A couple of different loran readings were taken day of the race by boaters assisting with the race. One reading came out right at a mile, the other indicated ~1.13 +/- .02 mile. Experienced swimmers thought the course was a little long - No one complained of a short course, not even the gator! (Incidentally, I learned that the race director, Ray Bentz, worked with Pete Riegel years ago on a project contracted with Batelle by the local Navy Base. Ray characterized Pete as a good worker.)

Paperwork for the Parker 5K Run is enclosed. Till next time, take care.

*Daniel Post* Cordially,

## THE ATHLETICS CONGRESS OF THE USA

Road Running Technical Council  
Bob Baumel, OK, SD Certifier

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1992-07-25

Mike Wickiser  
2939 Vincent Road  
Silver Lake, OH 44224

Dear Mike,

On June 13, 1992, I validated the course used for the 1991 Fujitsu 8 km Classic (CA-91014-TK) and also checked the course that would be used for the 1992 race (CA-92005-TK). Both courses checked out as extremely accurate—very close to the ideal 8008 m equal to the advertised 8 km distance plus short course prevention factor. The validation was greatly aided by the expert assistance of Tom Knight, who had originally measured both courses. Tom provided my lodging at his house, and ferried me around for two days in his car, and obtained a bicycle for my use. With Tom's help, this validation was extremely pleasant and easy and went remarkably smoothly (not counting the one incident where I was almost crushed by the closing gate at Loral Corporation).

Here is the sequence of events: Arriving at San Jose airport on the afternoon of Friday, June 12, I was met by Tom Knight and we immediately drove to the course. We drove around the course so I could familiarize myself with it, examining portions that might be troublesome, and deciding on the points to stop the bike and take counter readings. Then we stopped at the Start/Finish area where we checked various taped distances used for documenting Start & Finish, and laid out a 300 m calibration course on the street containing these points (Baypointe Drive) where Tom had previously determined there was enough room.

Notes on points where we decided to take counter readings:

- 1) We chose to stop at each marked split of the 1991 course **except** the 1 mile point because it's in the middle of a tangent that would require care in riding due to traffic. (This is on Zanker Road, which was drawn on the map as perfectly straight, but actually includes S-curves.) Instead of stopping at the 1 mile point, we marked an arbitrary point a short distance earlier (about 1.566 km into the race by our measurements the next day), labeled "Before 1 mi" on my enclosed results spreadsheets. Once all measurements were done, we *could* have used this reading to check the distance to the 1 mile split, but everything looked so good we saw no reason to do so.
- 2) A stretch about 500 m long (containing the course's midpoint) passes through Loral Corporation and is closed off by electrically-operated chain-link gates at both ends. This is the street labeled "Henry Ford II Dr" on the course map. We agreed to stop at reference points before and after this stretch (labeled "Before Loral" and "After Loral" on my spreadsheets). These are reference points that Tom Knight had previously used in his measurements: The "Before Loral" point is even with the "LORAL" sign; the "After Loral" point is even with the STOP sign just before Research Place. We knew that access to the Loral grounds might be tricky because Tom Knight repeatedly tried phoning Ralph Williams (Loral security chief) for several weeks before this validation, but got no response.
- 3) We arranged the measurement so as to check the 1992 course along with the 1991

course. Aside from minor differences in Start and Finish location, the main difference between these courses occurs between the "After Loral" reference point and the 3 mile split, where the 1991 course followed Village Center Drive but the 1992 course detours to Montague Expressway. For our measurement, we decided to follow the 1991 course to its 3 mile split. Then we interrupted this measurement and measured back to the "After Loral" point along the 1992 route (in reverse direction so we could ride legally with traffic on busy Montague Expressway). Finally we returned to the 3 mile (1991) split and resumed the measurement of the 1991 course.

**Checking Taped Distances at Start and Finish:** We were particularly interested in checking these distances because Tom Knight had discovered, as he checked and rechecked his measurements during the weeks leading up to this validation, that a few of the figures on his certificate for course CA-91014-TK were apparently in error. The biggest discrepancy was in the straight line distance between start and finish, stated on the certificate as 29.5 m. Tom's more recent bike measurements indicated this distance to be about a meter shorter. Tom and I checked this distance by steel tape on 92/06/12 and obtained 28.4 m, which agrees with Tom's recent bike measurements and shows the original figure on certificate CA91014TK to have been in error.

We also checked the distance between the fire hydrant and 1991 Finish, stated on certificate CA-91014-TK as 22.92 m. Here we obtained 22.95 m, differing only trivially from Tom's original measurement. (The tiny discrepancy may reflect the fact that Tom didn't have a 2nd person to hold the tape when he measured it the first time.)

Note that Tom has now prepared a revised version of certificate CA-91014-TK. This revised certificate corrects the two numbers mentioned above, and also includes corrected Altitude figures. I have therefore enclosed *three* certificates with the present validation report. These are: the original certificate for the 1991 course (CA-91014-TK), the certificate for the 1992 course (CA-92005-TK), and Tom's new revised version of certificate CA-91014-TK for the 1991 course.

**Laying out a 300 m Calibration Course:** At around 5:00 pm on 92/06/12, Tom Knight and I laid a 300 m calibration course along the northern edge of Baypointe Drive. This stretch of road includes the Start and Finish of the 1991 course and the Finish of the 1992 course. I had brought with me both 30 m and 60 m steel tapes. I would have preferred to use the 60 m tape, but we were thwarted by windy conditions that made the long tape difficult to handle. Therefore, we used the 30 m tape.

We laid out a raw distance of ten 30 m lengths. Given the measured temperature (24°C before taping and 22.75°C afterward), the temperature-corrected laid-out distance was 300.012 m. I therefore shortened this laid-out distance by 1.2 cm before setting nails to mark the endpoints of the calibration course that we would use for the bike riding Saturday morning.

Following these events of Friday afternoon, Tom and I had dinner at a Chinese restaurant in Menlo Park. Then he drove me to his house in San Carlos and we set up the bike he had obtained for me. A brief scare ensued when I discovered that all my papers concerning the validation were missing. Upon reflection, we realized that I had probably left them at the Chinese restaurant. Fortunately, the restaurant was still open. A phone call verified that they did indeed have my notes, so we drove back to Menlo Park and retrieved them.

**Measuring the Race Course(s):** The actual course measurement on Saturday morning, June 13, was a major social occasion, as two other measurers from the San Francisco area, Tom Benjamin and Paul Oerth, elected to participate. Thus, we had four measurers, including Tom Knight and myself. Happily, all four of us obtained



excellent agreement on both courses: For these 8 km races, the four measurements fell within a 2 m span for the 1991 course, and a 1 m span for the 1992 course!

Our strategy for these measurements was constrained by two considerations: (1) To minimize danger from traffic (particularly on curves in Zanker Road and Montague Expressway), we wanted to complete the measurement as early as possible. (2) Peter Nantell (technical race director) and other members of the race staff would not be able to show up until 9:00 am.

We decided to have the measurers gather at 7:30 am and perform the measurement **before** Nantell and his staff arrived. We knew that for the original certification, Tom Knight had measured a very strict SPR. Our strategy for the validation was to measure the course exactly as described on the certification map, following the same strict SPR intended by Tom in his original measurements. By thus verifying the certified route, we would show that runners ran *at least* the advertised distance if (as we expected) the only deviations from the certified route were coned sections that added *extra* distance to the course. In the unlikely event that, after meeting with Nantell, we learned that runners had shortcut portions of the course, we would be able to remeasure any necessary sections later in the day.

Given the logistics of coordinating four measurers, we were naturally a little delayed in getting started; thus, it was nearly 8:00 am when we began pre-calibrating the bikes. Most of the measurement went very smoothly. The potentially dangerous curves on Zanker Road and Montague Expressway were no problem, thanks to the planning Tom Knight and I had done the previous afternoon. (In addition to choosing the points for taking counter readings, we chose a number of other points where we would pause and regroup and then proceed when safe.)

The biggest problem was in getting through the gates at Loral Corporation. Because this was a Saturday, no guard was physically present at the gate. Instead, we had to talk remotely over an intercom to a guard located elsewhere. (This guard could see us through a TV camera but we couldn't see him.) Knowing that Ralph Williams had never answered Tom Knight's phone calls during the preceding weeks, we were not surprised when this faceless guard told us he had no information concerning our arrival or the purpose of our visit. However, just as Tom Knight had done during several of his earlier measurements, we succeeded in talking our way in.

Getting through the first gate (to enter the Loral grounds) was relatively easy. The real problem occurred at the second gate (leaving the Loral grounds). This second gate did begin opening as we approached it (either because the guard was watching us through TV cameras, or because the bikes tripped an electrical sensor). Unfortunately, as soon as the gate was fully open, it began closing again (and naturally, the space that started closing off first was the side that the SPR passes through).

As the gate began closing, Tom Knight (leading the procession) was only halfway through. To Tom, it was *déjà vu*, as the same thing had happened during some of his earlier measurements. Tom quickly moved ahead. I was right behind Tom. Somehow or other, I squeezed past the closing gate, although in my haste, I don't know how much I swerved in the process. Paul Oerth and Tom Benjamin were behind me. They both did quick sideways offsets and jumped through the still open portion of the gate.

We all did get through with our bodies and bicycles intact. Judging by our data, the incident appears to have had only a negligible impact on the measurement.

As we were running a little behind schedule (and we knew Peter Nantell would be waiting for us at the Finish), we had to decide, as we approached the 3 mile point, whether to include the planned check of the 1992 course (by backtracking along its



Montague Expressway segment). We figured that a check of the 1992 course was worthwhile, even if not part of the official (1991 course) validation. Also, we realized that delaying the measurement of this Montague Expressway segment until later in the day would make it far more dangerous and time-consuming. Therefore, we did include the 1992 course check within the validation ride for the 1991 course.

We finished the course ride and returned to the Start/Finish area at about 9:15 am, where we did find Peter Nantell waiting for us. (Then we made him wait another ten minutes as we recalibrated the bikes.)

**Verification of Route used for the Race:** At about 9:30 am, Tom Knight and I drove around the course with Peter Nantell and Tracy Rookwood (lead cyclist during the 1991 race). These officials confirmed that the 1991 race correctly followed all the restrictions in the certified course. (Specifically, runners were kept to the right of the median on River Oaks Parkway and were directed through the correct median break on Caviglia Drive.) The course set up for the 1991 race also included two *additional* restrictions, which forced runners to run slightly *longer* than the route that was certified (and checked in my validation ride). These additional restrictions were: (1) On Village Center Drive, runners were kept in a narrow lane along the left-hand edge; (2) Most of Zanker Road was coned along its center-line and runners were kept right-of-center. In both these cases, the course was certified (and validated) using the whole-road SPR.

After this drive around the course, Peter Nantell showed me the Start and Finish locations from the 1991 race. He had a photograph of the race start, showing very clearly that the Start was in the right place (at the lamppost depicted on the map). The photograph didn't document the Finish location as well, but Peter showed me the faded paint on the road verifying that the Finish was in the right place.

Unfortunately, no usable videotape was available for this race. (An attempt was apparently made to shoot some video, but it didn't work out for some reason.) I told Peter that, whether or not useful video is obtained, it's a good idea to always take some photographs specifically designed to show that key points on the course were set up correctly in case the race needs to be validated.

**Additional Tape Measurement of Calibration Course:** At about 10:30 am, Tom Benjamin, Paul Oerth and I re-taped the 300 m calibration course that Tom Knight and I had laid out the previous afternoon (thus providing an "independent" measurement without the original race course measurer, Tom Knight). This time we used my 60 m tape. (There was no wind problem this time.) With three of us on the 60 m tape (Tom Benjamin holding the rear, Paul Oerth pulling on spring balance at front, and myself marking tape lengths) the measurement was very quick and easy.

Checking the distance between the nails set the previous afternoon, we obtained a raw distance of 300.041 m (pulling tape with 50-newton force at measured pavement temperature 18°C). The temperature-corrected measurement is 300.034 m. I must also make an additional correction for tension: This particular 60 m tape was discussed in my article last year "Buying a Metric Tape" (see July '91 *Measurement News*, p. 16) where I explained that I had "calibrated" it on a stretch of road measured by EDM. Actually, if I had remembered what I wrote in that article, I would have used the tape with a 60 N pull instead of the 50 N force marked on the tape. In any case, my calibration data for this tape indicated that when used with 50 N tension, the readings should be corrected by a factor of 0.999946. Applying this correction, the final adjusted calibration course measurement is 300.018 m.

If the calibration course is assumed to be 300 m exactly, then my measurements of the 1991 and 1992 race courses indicate lengths of 8007.50 m and 8008.32 m respectively.

If we assume the calibration course to be 300.018 m (as obtained by the Saturday morning re-taping), my measured distances are 8007.98 m and 8008.80 m respectively. Note that I have enclosed *two* spreadsheets showing everybody's measurements of every interval: one spreadsheet based on an assumed calibration course length of 300 m exactly, and the other assuming the calibration course to be 300.018 m.

On the official Validation Report form, I did the calculations assuming a calibration course length of 300 m exactly. I wrote it up this way in part because that's what I obtained in my *first* measurement of the cal course, and in part because the 1991 race course length obtained by assuming a 300.018 m cal course length (8007.98 m) looks a little unbelievable. Actually, the 300.018 m figure is almost surely the more accurate one, obtained by a three-person measurement using a 60 m tape calibrated against EDM. In any case, the difference is pretty insignificant. The course passes the validation with flying colors either way.

**Afterward:** On Saturday afternoon, Tom Knight and I repaired to his office at Stanford, where I worked up a preliminary version of the enclosed spreadsheets using his Macintosh IIfx. That evening, Tom and I and the rest of Tom's family (wife Valerie, and children Kimberly and Gavin) were treated to dinner at Chevy's Mexican restaurant in San Francisco at a party for workers in the Bay to Breakers race. We were there as guests of Peter Nantell, who is technical director for Bay to Breakers as well as the Fujitsu race.

My plane didn't leave until around noon Sunday. (I had left lots of time for additional measuring if necessary.) But with our work essentially done, Tom and I went for a pleasant run at a site frequented by many runners in his area (alongside a reservoir). Then he drove me to the San Jose airport and I returned to Ponca City.

The success of this validation was due largely to Tom Knight, who did a great deal of the work. I would like to thank Peter Nantell and the rest of the staff of the Fujitsu race for their cooperation. I thank Tom Benjamin and Paul Oerth for their participation in the measurements. And I must also thank everyone in Tom Knight's family for putting up with me during the two days I stayed at their house.

A major reason why this validation was so easy was Tom Knight's attitude when he originally measured the course for certification. Tom measured a strict SPR (using either whole road or all of road to one side of a median), knowing that race officials would later cone some portions, forcing runners to go a little bit longer. Some other measurers would have tried measuring the exact route available to runners in the race, accounting for every cone the race officials intended to set out. Such a course would be torture to validate, requiring precise verification of every cone position on race day. In the present case, it was easy to verify the accuracy of the certified course and to verify that runners ran *at least* as far as the certified course.

In addition to officially validating the 1991 Fujitsu race, I also confirmed the accuracy of the course certified for the 1992 race. It is my understanding that Tom Knight was present at the 1992 race (held on June 20). If any records were set in the 1992 race, I believe that a statement from Tom attesting to correct use of the course would be adequate to consider that race validated.

Sincerely,

*Bob Baumel*

Bob Baumel

cc: Riegel, McBrayer, Nicoll, Knight, Nantell, Grenier, Benjamin, Oerth

NOTE: MEASUREMENT  
DATA APPEARED  
IN JULY MIN.

TAC/RRTC VALIDATIONS QUARTERLY REPORT 7/20/92

VALIDATIONS											
DATE OF RACE	DATE OF VAL	SEQ	DIST	DATE	NOM METERS	MEASURED METERS	DIFF M/KM	COURSE ID	RACE NAME/COURSE	MEASURER	VALIDATOR
11/90-91	11-23-91	202	5k	89	5000.0	4988.7	-2.26	CA 89027 CW	YOLO GEN HOSP TURKEY TROT *** VALIDATED, BUT NOT RUN, AS CERTIFIED.	SCOTT	KNIGHT OK AS RUN
1-4-92	1-4-92	203	10k	92	10000.0	10021.47	2.15	NC 91088 ACL	CHARLOTTE OBSERVER 10K *** PRE-RACE VAL	LINNERUD	NICOLL
4-5-86	1-19-92	204	50k	86	2500.0	2498.268	-0.69	WA 86006 TD	NOAA 2.5 RACEWALK LOOP	GREISZ	BARRETT
6-15-91	6-13-92	205	Bk	91	8000.0	8007.5	0.94	CA 91014 TK	FUJITSU BK (1991)	KNIGHT	BAUMEL
6-??-92	6-13-92	206	Bk	92	8000.0	8008.32	1.04	CA 92005 TK	FUJITSU BK (1992) * PRE-RACE VALIDATION CHECK	KNIGHT	BAUMEL
7-4-90	7-10-92	207	10k	90	2000.0	2003.47	1.74	NY 91047 AM	ROBERT MOSES PKWY. 2K RACE MACPHEE		NICOLL

\* CA 89027 CW - Completed and reviewed during TAC Convention after submittal of 1991 Validation report

Currently assigned, not completed :

NOM	COURSE	RACE NAME	MEASURED BY	VALIDATOR ASSIGNED
2.5K	CA89015RS	Cal State Race Walk	J.Coots	R.Scardera
5 K	MO91025B6	St. Louis Wes Race Wk	D.Sebben	B.Glauz
8 K	CA90005TK	Fujitsu	T.Knight	B.Baumel * VALIDATION COMPLETED FULL REPORT PENDING
10 K	IL91033JW	Nat'l Masters Race Wk	J.Knoedel	J.Wight
40 K	NJ860056D	Ft. Monmouth Race Wk	D.Johnson	W.Nicoll
40 K	NJ91020DB	Ft. Monmouth Race Wk	D.Johnson	W.Nicoll
15 K	FL92001WN	Gasparilla Dist.	W.Nicoll	D.Loeffler
2 K	DC88006RT	DC Reflecting Pool	R.Thurston	M.Wickiser
5 K	CA86068PR	Carlsbad 5000	J.Collias	W.Nicoll * REVALIDATION DUE TO AGE OF COURSE, ARTIFICIAL TURNS

SUBMITTED : MICHAEL A. WICKISER  
TAC/RRTC VALIDATIONS CHAIRMAN

THE ATHLETICS CONGRESS  
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June 22, 1992

Ted Paulin - Olympic Park - Swan Street, Melbourne  
Victoria 3002 - AUSTRALIA

Dear Ted,

Some time ago you sent me a snappy-looking AIMS Measurer jacket and a helmet. I like to wear the jacket whenever I can, since it clearly identifies me as a person who is doing something official, and adds credibility with people who are unaware of the measurement process.

I was not too interested in the helmet, since I had never worn one. Lately, however, Joan has been urging me to wear the thing. To reduce her anxiety, I began to wear it during all my measurements, even though I knew I was accident-proof.

I went out last Saturday to finish up the measurement of a local half marathon. Everything was going fine until just after I had laid out the 8 mile split. About a half mile onward I was riding on the left side of a left hand bend (against the traffic in US), and a bunch of cars were coming at me. I could have stayed where I was - they were not close, and I thought they saw me - but for some reason I elected to move over to the berm, which was gravel. I lost control and went headlong into the ditch, butting into a rusty square-mesh farm fence with my head. I had my new AIMS helmet on, and it got some good gouges in it, but my head did not. I was whole and unmarked, and the only thing I suffered was having to ride back to 8 miles and restart. The bike, fortunately, was undamaged as well.

Having learned the lesson better now, I intend to keep on wearing the helmet.

Thanks for saving me from some nasty gashes.

Best regards,





**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.*

**WAYNE B. NICOLL**  
Ragged Mountain Club  
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Mary Anne Wehrum  
President  
Memphis Runners Track Club  
P.O. Box 17901  
Memphis, TN 30187-0981

15 July 1992

Dear Mary Anne,

I apologize for my overdue response to your request for guidance regarding the alleged prohibited assistance incident in your Cellular One River Run 10K on April 25th. It caught me in the midst of the opening of a very busy race schedule here in New England. That activity plus a number of travel commitments related to the Olympic Trials kept me away from the word processor.

With the increased growth of road running and its cash awards, international competition opportunities, and higher visibility for women and masters athletes, the number of incidents involving assistance to runners has grown dramatically. The most common type assistance incident is similar to yours. It often involves a lead woman athlete who receives some form of assistance, usually from a male who is not entered or has already finished the event. Most race organizations have been unprepared to handle an incident the first time it is reported. However, most large races are now able to deal with potential unauthorized assistance problems and other rules infractions.

A major road race should have an officials structure in place that can insure that the competition will be fair. At a minimum, there should be a Road Race Referee and a three to five person Jury of Appeal. If an incident is reported to the race staff, the Referee should be informed and he would proceed to determine the facts and render a decision on the matter. The Referee may learn of the incident through a protest filed by another athlete. A protest must be filed within 24 hours after results have been announced. If the Referee determined an athlete had received unauthorized assistance or was involved in some other infraction of road racing rules, he would probably take whatever action he felt was appropriate. If the athlete affected by the Referee's decision did not like the decision, he/she could appeal to the Jury of Appeal who would review the matter and either uphold or overrule the Referee's decision. The appeal must be filed within 24 hours after the Referee's decision has been announced.

That is how the structure is set up to handle incidents. In the Memphis case a woman masters runner was accompanied by her coach, an unregistered runner, for a portion of the run, and some conversation took place as they ran together. The woman runner went on to finish first in her age group and was awarded a modest amount of prize money. I believe this violation was not reported until the day or several days after the event. This is fairly typical in road racing and will probably lead to some greater latitude in how long the athletes have to file protests and appeals. The infractions are often discovered on the evening news television coverage. If the Memphis race had a designated Referee and Jury you still could have followed the process of rendering a decision and allowing the athlete to appeal to the Jury. Had I been the Referee, I believe I would have disqualified her from the age group scoring and the prize money, but a Jury might have seen it differently.. It is usual policy of most prize money races not to issue prize money at the awards ceremony. They often wait up to ten days to insure there are no protests or athlete eligibility problems before mailing the check.

If you hold a TAC/USA Championship, the Referee and Jury members should be certified TAC/USA officials. For other races you could use non-certified people, but pick people who are highly experienced as managers and competitors in the sport. I recommend you encourage certification of your staff members so they are qualified and more conversant with the rules. If you conduct wheelchair events and award prize money, it is recommended you have at least one staff member who is thoroughly familiar and updated on the rules in wheelchair racing. Be sure you have a copy of both the TAC/USA and Wheelchair USA rules with you at the race.

I hope this is helpful to your organization and its excellent running program. Feel free to publish all or any part of this letter and if you need more information or guidance, let me know. It is our eventual goal at TAC/USA to produce a recommended slate of certified road race officials and to produce a road racing rules and guidelines handbook for clubs like yours. Good luck with your future events.

Sincerely,



Wayne B. Nicoll  
Road Running Technical Council  
TAC/USA

### CONCRETE VS ASPHALT

Here is Tom Knight's comparison of concrete surface vs asphalt surface on Baypointe Drive 300 m, San Jose, CA. 74F temperature throughout. Tom used a pneumatic tire. Evidently this cal course offers the rider a choice of concrete or asphalt to ride on.

ACCORDING TO TOM, THE CONCRETE IS THE GUTTER, BUT SOME PEOPLE CALIBRATE THERE.

Begin at 13:07, 19 July 1992

72000			
74812	2812	2812.25	Average counts for 300 m
77624	2812	9374.167	Counts per kilometer
80436.5	2812.5	15086.26	Counts per mile
83249	2812.5		ASPHALT

83249			
86062.5	2813.5	2813	Average counts for 300 m
88875	2812.5	9376.667	Counts per kilometer
91688	2813	15090.28	Counts per mile
94501	2813		CONCRETE

94501			
97313	2812	2812	Average counts for 300 m
100124.5	2811.5	9373.333	Counts per kilometer
102937	2812.5	15084.92	Counts per mile
105749	2812		ASPHALT

5749			
8562	2813	2812.875	Average counts for 300 m
11375	2813	9376.25	Counts per kilometer
14188	2813	15089.61	Counts per mile
17000.5	2812.5		CONCRETE

End at 13:44.

Asphalt average =                    9373.75 Counts per kilometer  
    15085.59 Counts per mile

Concrete average =                    9376.458 Counts per kilometer  
    15089.95 Counts per mile

Difference =                            2.7 Counts per kilometer  
    4.4 Counts per mile  
    0.29 m/km  
    2.89 Meters in 10 km

Tom says "It points out that for really important validations we may have to consider such effects if a course is right on the edge of passing or failing."



**The Illinois Association  
Athletics Congress**  
of the **USA**

Road Racing • Cross Country  
Track & Field • Race Walking

111 W. Butterfield Road, Elmhurst, IL 60126 • 708/833-7303 • FAX 708/833-5162

January 7, 1992

Jay Wight  
4419 Thornbark Ct.  
Hoffman Estates, IL  
60195

Jim Knoedel  
6157 N. Sheridan #20D  
Chicago, IL 60660

Chuck Hinde  
9916 Mansfield  
Oak Lawn, IL 60453

Dear Jay, Jim and Chuck,

Our list of active course measurers (enclosed) is 3-4 years old. I'd like to update it and I need your advice re the best way to do that. I could send a letter to our current list, asking each if he (no women!?) wants to stay on the active list and/or to list others who would like to become active.

Additional possibilities: Illinois TAC is under no obligation to maintain such a list; but if we do, this is also an opportunity to suggest (require?) some standards re price, procedures and, possibly, training. What comes to mind re the latter is the Illinois TAC Road Race Directors School. We could require that anyone who wants to be listed must attain Level I proficiency, for example.

If we do the latter, who decides who is proficient at what level? The three of you obviously, would need to agree whether you are currently Level II or III. Whatever, I hope I've got enough started with the three of you to get some decisions made. Please consult with one another and, if possible, reach some consensus re the above...and any other measurement/certification matters you choose to chew over.

Yours in Athletics,

Ray Vandersteen

Currently Jay is listed as Illinois TAC's Road Race Certification Chair (and Regional Certifier, RRTC). Chuck, Road Race Records Chair and Jim, LDR Chair. Let me know how this organizational structure fits into the above, too. Suggest changes here, too, if you think it'll help.



February 1, 1992

Mr. Ray Vandersteen  
Illinois TAC  
111 W. Butterfield Road  
Elmhurst, IL 60126

Dear Ray,

I am in receipt of your letters of November 27 and January 7 regarding the course certification process. If you need me to make a presentation at the March 14 race director's conference please let me know. I'll have two final exams the next week but I suspect I can make time for a presentation on Saturday.

As for the list of course measurers, I would encourage Illinois TAC to continue to maintain the list. I realize there is no obligation for you to do so, but in the interest of furthering quality in road racing events it only makes sense. The fact that the procedures are spelled out in a TAC publication and that with the current problems CARA is experiencing the TAC office is a natural clearinghouse for such information.

I'm not really sure what to do about the list, though. If I had a grandiose scheme and had the time or motivation to pull it off I would like to see every running club in the state have a trained measurer among its membership. However that has a few flaws as I'm sure you're aware. At one time running clubs put on a lot of the races. Now it appears that more and more races are being administered by professionals who work for a fee. It only seems natural that they would employ fee measurers. It makes sense that these various organizations would align with a particular measurer and that appears to be what has happened. Would I like to have more fee measurers? Of course I would, and I would suspect Jim Knoedel and Chuck Hinde agree with me. This will be my sixth year measuring courses and my fifth as certifier. It takes a lot of time in the spring, summer, and fall. Often I'd like to be doing other things.

The question is: How do you recruit and train the fee measurers that we appear to need? I don't think we want people in this "business" just for the money. We need people who are good with the numbers but who understand running as a sport and to some extent a business. I'm not sure where they come from. I can recall the class I took that got me started. That was in 1986, I believe. None of the other people in that class are still measuring courses. I have no answers. All TAC members are solicited at least annually about interest; you're apparently not getting takers.

Wayne - Please  
let me know if I'm  
off base here or if you  
have suggestions about  
what else we can be doing  
JW.2/1

As for "level III" and the like, the only true levels the measurement community has established are the certifier/final signatory designation and the IAAF approved measurer designation. I do not think that a fee measurer needs to be either of these. Historically the philosophy here has been to avoid relying too much on one individual or small group and to encourage simplification of the measurement process. I would suggest that before a measurer is recommended by the TAC office that they be recommended by the state certifier, which of course in this case is me. The names that come to mind immediately besides Jim and Chuck are Alan Avery in Springfield and Tom Antczak in Rockford. Rich Peterson in Des Plaines has measured a handful of courses but I am not sufficiently impressed with the quality of his work that I would recommend him. Of course, Karl Ungurean of Davenport, Iowa is a final signatory and I would recommend him as well. The only "club" measurer to do any real volume of work is Gary Moss. We might inquire with him about the way to get more club members into measurement- or if TAC or CARA has a periodic publication it sends to its member clubs I'd be willing to work with you to try to scare up some volunteers.

I question the need to require standards on price and training. First, training. It's my opinion that the TAC manual is sufficient to guide a measurer through the process 90 percent of the time. We've had any number of successful measurements by first time measurers who had little else but the manual. In fact, I wouldn't be too surprised if training doesn't scare some folks away. This isn't brain surgery. As far as price is concerned, I think the market should determine that. A 10K measurement takes me most of a weekend morning- and that's if the race director knows what he or she wants. It takes another hour of paperwork, not to mention the copying, mileage, tolls, etc. I've heard of measurers elsewhere getting \$250 for a 10K. I don't think any of us charge nearly that. I'd really hate to see a set of standard fees. I think if one of us is too expensive he'll find out about it. If one is so cheap that he measures all of the courses he'll raise his prices. The bottom line is that I don't think that, at least in the Chicago area, course measurement is so expensive a proposition that people are cutting it out of their race budgets. Let me know if I'm wrong. If we prescribe fees we may lose the measurers we have.

I've rambled on enough. For the record book, I believe the number of courses certified last year in Illinois was 69- 5 by Karl and the other 64 by me. The first course of 1992 is enclosed with this letter. We'll see what the rest of the year brings. Please call me if you would like to discuss this further.

Sincerely,

  
Jay Wight

cc: Wayne Nicoll



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men and women and boys and girls  
at all age levels.*

**WAYNE B. NICOLL**  
Ragged Mountain Club  
Potter Place, New Hampshire 03265  
(603) 735-5721

7 February 1992

Jay Wight  
4419 Thornbark Court  
Hoffman Estates, IL 60195

Dear Jay,

Greetings from the land of too much cold and too little snow. I am responding to your letter to Ray Vandersteen dated 1 February 1992 and the attached letters from Ray dated 27 Nov 91 and 7 Jan 92.

The Association should be encouraged to maintain a list of course measurers that can be recommended to others. When I get inquiries on who could be contacted for measuring a course, I usually start with a few of the better ones. Once a measurer has two or three that have successfully been certified I will offer his name if he is geographically located close to the race site. I think you are correct in providing your assessment of which measurers should be on the list.

Sometimes measurement training at seminars works out OK and others it does not. The most success I have had in spawning measurement and certification is when a group recognizes the need for training and asks me to come train them. I was particularly successful at ones I did in Memphis and in two cities in SC. I try to de-emphasize the aspect of fee measuring but will give fee guidance if asked. The system was designed so anyone can do their own measuring. When a person does all of their own calibration course layout, race course measurement and paperwork, the certifier actually is guiding and training that person during the process. A fairly successful means of training I have found is one-on-one on a course being measured. It usually takes me two to three times as long to measure because I am teaching all the way -but that student really learns, and a high percentage of them stick with it.

Categorizing measurers formally into level categories is too much extra work. Someone would soon decide, as the South Africans have done, that there should be formal testing of measurers, including written exams. The measurement process is testing enough. That would tend to discourage the little club guy who only wants to measure his one favorite course. Also, you do not want a situation like the North Carolina Association, which has the Final Signatory acting as a measuring agent for the Association. The effect has been to discourage measuring by hardly anyone else in the state.

We have evolved levels within the RRTC that are strikingly close to the levels used for TAC/USA officials. An apprentice certifier (reviewer) is the equivalent of an Association official. A regional certifier (final signatory) is like a National level official, a validator equates to a Master level, and an IAAF Measurer is our highest category, same as T&F officials. I have given some thought to formalizing this so certifiers would be badge wearing officials. I feel it would enhance their credibility when they have to deal with T&F types regarding course matters.

If you do want to hold workshops, Chuck and Jim are certainly capable of conducting them. You can do a pretty good indoor workshop if you have a large classroom and can lay a "calibration course" and a "race course" in the room. You can walk a bike, or use a Nicoll rolling wheel in lieu of the bike. It is important to allow sufficient time to take the students all the way through the process, including completing a set of the paperwork and drawing the map. Most Race Directors workshops do not allow enough time for measurement training and not many of the attendees are measurement oriented. At RD workshops I usually offer an administrative type briefing that exposes the race reps to the program but does not address technical measuring matters.

I would definitely discourage trying to set measurement fees. The fees generally sort themselves out according to what the market will bear. I do very little measuring in New England because I have helped train many measurers who will work for much less than I will.

In summary, you guys are on the right track and have a better Certifier/Association relationship than many others. Holler if I can help.

Sally is taking a women's Ekiden team to Beijing in March. We will be in Columbus for the Marathon Trials. Pete has to be at the London Marathon the same weekend.

Cheers,



Wayne B. Nicoll  
Vice Chair East, RRTC

Copy: Ray Vanderstoep, Pete Riegel

## Rick Recker

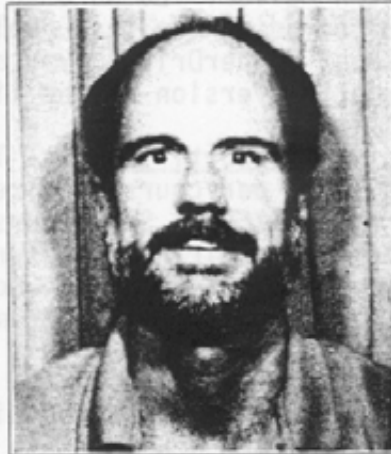
His name may not head the list of race finishers, but it is one of the most recognizable names in racing in Minnesota.

As president of the Minnesota Distance Running Association (MDRA) and as Minnesota's long-distance running chair for the Athletics Congress (TAC), Rick Recker has his hands in most of the races run in the state. And since he ran in 90 races last summer, he has his feet in many races, as well.

Recker, 43, is in his second term as president and in his 25th year as a member of the MDRA, the state's largest and oldest running club. Recker and the MDRA promote the state's many races throughout the year — and the sport of running itself. The club leads a marathon training group prior to the Twin Cities Marathon and holds weekly fun runs throughout the summer. Recker also directs the Metrodome running program in the

winter. As if that's not enough, Recker serves on the advisory board of the Twin Cities Marathon.

Recker is also well-known for his unique running vacations, which he calls "adventure runs." Recker recalls an adventure run in South Africa



Rick Recker

where he met nearly 100 baboons on a small country road. On another adventure, Recker took an early morning run in a Fiji jungle while large fruit bats flew overhead. "Travel is the best educator there is," says Recker. "I've gotten lost, but that's the best way to learn about the area."

Minnesota runners would be lost without the work of Rick Recker.