

# MEASUREMENT NEWS



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March

1992

Issue #52

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Our cover this month was the cover photo from *The British Road Runner*, April-July 1991. Their caption read "A course measurer accurately setting a mile mark with the aid of a Jones Counter." In this MN, see the article "Cutting Corners," which appeared in that magazine.

## MEASUREMENT NEWS

#52 - March 1992

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### HEART RATE MONITORS

Canada's Andy Jones, course record-holder at the Strolling Jim 41.2 Miler (only person to ever break 4 hours), recently won the Mardi Gras 100 km race with a time that would be a TAC All-Comers record if ratified. The course was measured by Chuck George at the very last minute, and Tom McBrayer is still helping him get the documentation squared away.

If the timing was OK, and the course is correct, which is likely, given recent validation experience, there may remain a small problem. Andy wore and used a heart rate monitor throughout the race. He obviously had no unsportsmanlike intention, or he would not have written the intelligent and practical article for Ultrarunning Magazine which you will see in this issue. Still, opinions are divided on the use of the monitor, including those relating to the text and intent of TAC Rule 66.1.

In this issue you will see some correspondence relating to the issue. Do you have an opinion? Let me know if you do. This issue is certain to receive some attention at this year's TAC Convention.

Heart monitors are now accurate, noninvasive and available to all with \$150 to spend. Do they give unacceptable assistance or unfair advantage? Should their use in competition be allowed or prohibited?

### JONES/OERTH COUNTER AVAILABILITY

The January issue of AIMS Newsletter announced that Ted Paulin, Technical Director of AIMS, was taking foreign orders for Jones/Oerth counters. It also mentioned that AIMS was the exclusive non-USA source for the JO counter. **NOT ENTIRELY CORRECT.** Paul Oerth will still handle an order from any place in the world. No exclusive arrangement with AIMS exists.

	US Price	Foreign price
5 digit counter	\$45	\$50
6 digit counter	\$55	\$60

Price includes first class mail delivery in US and airmail delivery elsewhere. Those purchasing in quantities of 10 or more may deduct \$5 per counter.

Foreign orders should be paid with International Draft in US Dollars, American Express Travelers Checks, or cash.

To order, write to:

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

## AIRLESS TIRES

The Capair tire has no inner tube, and does not go flat. It's not exactly solid, but it is "airless." It rides very much like an ordinary tire, and does not have a large change of calibration constant with temperature. It may now be ordered direct from the manufacturer. US price is \$28 per tire, postpaid. Available sizes are: 20x1 3/4, 22x1 3/8, 26x1 3/4, 26x1 3/8, 27x1 1/4, and 27x1 1/4 (10 speed). Mike Girard of Capair says that if a buyer gives an "E.T.R.T.O." number from their rim, they can generally supply a tire to fit it. Otherwise you can buy a tire and then go buy a rim to fit it like Pete did. You can get ahold of Capair at:

Capair Inc. - 2330 S. Susan St - Santa Ana, CA 92704  
Phone 714-556-9000  
FAX 714-556-9005

Pete Riegel recommends this tire. It's the best airless tire he has ever used.

## LAST MONTH'S PUZZLE

Brian Smith's brainteaser concerning the ladder, the house and the air conditioner lit up some competitive fires. The first sensible right answer (18.804) was received on Tuesday, January 7 by telephone from Mike Wickiser. The first pair of correct answers (there are two correct answers, one of which is not very practical) was received 20 minutes later in a FAX from Germany's Helge Ibert, who must have worked very fast. January MN was mailed on Friday, January 3. Gene Newman's correct answer came by mail a few days later.

## MAPS OF THE MONTH

Ed Okie is a new measurer who just started last year, and who now has 3 courses measured. His map of the Bartow Superintendent's 5k is superlative. I have seen many computer-drawn maps, and they always seem to have some esthetic flaws, which are forgiven by computer enthusiasts. They seem rather like a talking dog - that it talks at all is a marvel, so one is not critical of what it says. Ed's map, however, computer-drawn or not (I can't tell for sure), is a fine piece of work.

Month in, month out, Fred Shields goes on with the consistently best (in my opinion) mapwork in the US. He has already been a map-of-the-month measurer, but his Metro-Dade Marathon map is an extra-good example of his artistry.

## COVER PHOTOS

Your Editor is becoming increasingly desperate for cover photos. If you have any measurement-related picture that you would like to see on the cover of MN, please send it to Pete. It will be returned.

## The rundown

By Wayne Nicoll



### When helping can hurt

While in Charlotte serving as a TAC/USA official (course inspector), I found myself the subject of a minor controversy within the TAC Liaison Team for actions I took on the race course during the Women's National Championship 10K.

Road racing has grown dramatically in terms of prize money and opportunities for international competition. There has developed a critical need for rules and policies regarding the fairness of the competition.

In relating this incident, I am raising the subject of prohibited assistance in road racing in the hopes I can convey to you an awareness of the need for all of us, as officials and spectators alike, to avoid actions that create a situation of unfairness in competition that might lead to disqualification of an athlete.

The Charlotte Observer race staff had an ambitious schedule on race morning, holding a masters 10K, the TAC/USA Women's Championship 10K, and the TAC/USA Men's Championship 10K consecutively on the same course. They also sandwiched in the start of the marathon between the championship races.

I was out on the course on my bike, conducting a measurement check and monitoring the events in progress. While observing the early part of the women's race, I noticed there were quite a few slow masters runners who would be overtaken by the elite women runners.

There were groups running three abreast that could constitute a problem to the faster elite women. As the race lead vehicles approached, I advised a lead cyclist of the potential problem. He acknowledged and moved ahead to work on warning the slow masters runners to open a path for the approaching women.

As lead runner Lynn Jennings approached, I pulled along beside her and warned her of the slow runners ahead. I dropped back and did the same for the second runner, Francie Smith, and again for the third runner, Janis Klecker. I felt that once we had the flow of women runners established through the slower ranks, the rest of the women would not have a problem. The lead vehicles were successful in opening a path so I went back to measuring and monitoring.

When I returned to the finish area, the TAC Women's LDR Liaison representative, Lee Ann Meyer, who was in one of the lead vehicles of the women's race, was waiting for me. She wanted to know what I had said to Lynn Jennings on the course.

I explained to her my actions as I have described above. Later the TAC Liaison Team met for lunch and a review of the activities began. My conversation with Lynn Jennings was again discussed, and both George Regan (the Men's TAC Liaison) and Lee Ann expressed their concern over my actions. I was a little miffed about it and again explained why I spoke to the lead runners.

George pointed out that providing information to an athlete by an official on the course was contrary to TAC/USA guidelines regarding fair competition in road racing and could be in violation of Rule 66 regarding assistance to athletes. Even though I felt justified in taking the action, there could have been cause for a woman athlete to protest.

Try this scenario. The fourth woman runner watches the video tape of the race and notes that a person on a bike, believed to be an official, is giving information to the lead runner. Learning that both the official and the lead runner are from New Hampshire, one could conclude Lynn was receiving information that would give her an unfair advantage.

For example, if I informed her of the interval between her and the second and third runners, that would constitute prohibited assistance. A protest could justifiably be filed and a lead runner could be disqualified. I sweated out the next few days, hoping that one of the other contestants did not suspect me of unfair actions.

Your initial reaction is probably, "Just more of that TAC bureaucratic nonsense." Rule 66 and the Guidelines for Fair Competition in Road Racing are not the creation of some little old men in straw hats and blazers.

The rule and guidelines were gradually hammered out by road runner delegates at TAC conventions over the past several years as a result of athletes' complaints about the many improper actions by officials and others, both authorized and unauthorized, on the course who create unfair situations. Many of the incidents have involved assistance to women runners, so most of the action on this matter was accomplished by members of the Women's LDR Committee.

All of us who have worked road races and stood along the course for years have developed some bad habits. Runners should not be receiving unofficial splits, medical or refreshment support, or technical aid from any unauthorized person on the course.

If you, as a friend of the runner, step out onto the course and pass a water bottle to your runner, you could cause the runner to be disqualified. No runner should be accompanied for any portion of the race by an unregistered person or non-competitor. The husband who trots along beside his wife, feeding her information on her place and time, could risk her disqualification.

The guidelines give some specific advice to officials and others permitted on the course. They should refrain from any action that could be deemed as giving prohibited assistance. They should not engage in unnecessary communications with competitors.

All persons on the press vehicle, lead vehicle, or bicycles should be reminded they are there as a matter of privilege and not of right. They should remain impartial and refrain from giving instructions to competing athletes or acting as a cheering section.

Perhaps now you better understand why I came under close scrutiny at Charlotte. How could I have better handled the situation? I would not have spoken to the athletes at all. (All three of them played it cool toward me -- they made no acknowledgement of my comments.) I should have simply advised the lead elements and attempted to help in any way I could.

The surface has been barely scratched on this subject. I strongly recommend if you have a big race with prize money or other important incentives, such as international qualification, you should obtain a copy of the Guidelines for Fair Competition in Road Racing and insure all of your volunteers are briefed on its material. For a copy, contact TAC/USA, One Hoosier Dome, Suite 140, Indianapolis, IN 46225, 317-261-0500.

# THIS MONTH'S PUZZLE

A race director calls and says he wants you to lay out and certify a 5K and a half marathon course. His requirements are as follows.

1. The finish line for both races is to be even with a flag pole in front of a park recreation building.
2. A common out and back course on a bike path to the South is to be used. The path to the South is 12 miles long.
3. The start should be to the South so stragglers won't congest the start of the race.
4. He wants to give splits at each mile but has a limited amount of volunteer workers.

What would you recommend?

*Bill*

THE ATHLETICS CONGRESS  
OF THE USA

Road Running Technical Council  
Peter S. Riegel, Chairman

January 28, 1992

Bill Grass - 8183-S N 107 St - Milwaukee, WI 53224

Dear Bill,

Here is my entry in your puzzle. I am going to forward the entries to you after next MN comes out, and you can be the arbiter who decides who wins. I will direct people to send their entries to you, and if anybody sends one to me I will forward it to you with a note as to when I received it. If you object to this procedure, let me know and suggest something else.

Best regards,

*Pete*

SEND ANSWERS  
TO  
BILL GRASS

3354 Kirkham Road  
Columbus, OH 43221

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

Columbus Roadrunners  
PO Box 15584  
Columbus, Ohio 43215-0584



**INVITATION!**

COURSE MEASUREMENT/CERTIFICATION WORKSHOP

If you have an interest in learning how to measure a race course and get it certified, then this workshop is for you.

INSTRUCTOR: Pete Riegel, TAC, Road Running Technical Committee  
SPONSOR: Columbus Roadrunners

DATE: Sunday, May 17, 1992 Rain or Shine Come prepared!

TIME: 8:30-9:00 - Registration  
9:00-4:00 - Workshop (includes lunch)

PLACE: Battelle West Jefferson Facility  
West Jefferson, Ohio

COST: \$60 includes measurement book, Jones Counter, & lunch  
\$15 if you have your own Jones Counter  
Attendees must supply their own bicycle

DETAILS: -The maximum number of attendees is 20. There are several purposes for this workshop, one of which is to have course measurers throughout the State. Therefore, enrollment will be allocated by region. If a particular region does not fill its quota, the space will be allocated to a region with filled capacity until the maximum number of attendees is reached.  
-Confirmation notices will be mailed to all selected attendees. Notice will include complete details and a map to the West Jefferson facility.

QUESTIONS: Call Sue Daly, (evenings) 614-890-1309

REGISTRATION: Registration and payment must be received by APRIL 11, 1992. Make checks payable to: Columbus Roadrunners and mail to: P.O. Box 15584, Columbus, Ohio 43215-0584. No refunds if selected to attend.

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY/STATE/ZIP: \_\_\_\_\_

RUNNING CLUB AFFILIATION: \_\_\_\_\_

PHONE: (DAY) \_\_\_\_\_ (EVENINGS) \_\_\_\_\_

\_\_\_\_\_ \$60 (measurement book, Jones Counter and lunch)

\_\_\_\_\_ \$15 (measurement book and lunch) I OWN AND WILL BRING WITH ME A JONES COUNTER

ALL PARTICIPANTS MUST BRING THEIR OWN BICYCLE.

# CUTTING CORNERS

**Rule 15.1:** "All runners must follow the course designated and follow the normal rules of the road."

**Rule 15.2:** "The race referee has the power to disqualify any runner who does not follow the correct route."

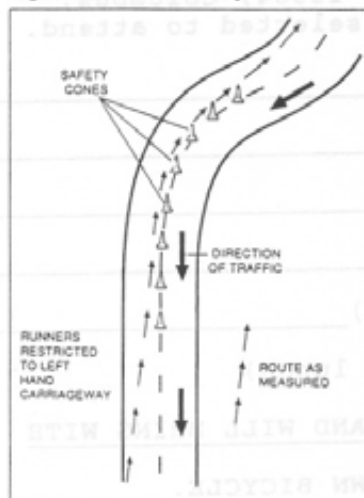


When a race director/organiser develops a course for his race, this is always done in conjunction with the local police. Both the AAA and BARR require that whatever advice may be given by the police is heeded or acted upon.

Some events are able to enjoy the benefit of using roads "closed" to traffic, which gives athletes the advantage of using the whole carriageway, while others manage to provide a coned-off passage, free from traffic, such as was used in this year's Langbaugh Marathon. Other events, indeed the vast majority of races, are allowed to use "open" roads with the acquiescence of the local council and local police. Thus runners have to share the road with traffic.

Remember, it is the Council that allows us to use the roads, although the police can, and in fact do, have the power to say "no — you cannot organise a race on that road at that time".

Recent developments in the Home Counties illustrate these points. Race organisers have suddenly found them-



selves obliged, for the first time, to apply for full road closures. In consequence, events have had to be cancelled — often at short notice, because of the time and effort then required for detailed discussions with both the police and the Council over their new criteria.

When a course measurer first looks at a proposed route along with the race organiser, two of the questions that he will ask are: "how much of the road surface are runners going to be allowed to run on?" and, on corners, "what line are the runners allowed to take?"

The course measurer will then ride the shortest possible path that the runner could, and is allowed to, take.

## CORNERS

On an "open road" course, the organiser has a duty to protect the runner as much as is possible and so competitors should run and stay on the left of the carriageway.

If it is not possible to stop traffic as the race passes, then where there is a point where an athlete could "cut" a corner — e.g. by crossing onto the other side of the road on a right-hand bend, then marshals and/or cones should be provided. This should allow for a safe separation.

On left-hand turns, cones and/or marshals can be used to keep the athlete on track. Marshals should always be competent adults dressed in bright tabards. They should be instructed to report the number of any runner who cuts the course.

In this day and age, money prizes and incentives (by way of subventions) are often provided on the basis of performance over a set distance. Leading runners in a race who cut corners are running less than the prescribed distance, cheating, and are guilty of gaining an advantage over those who keep to the

measured route.

Ideally the race referee and course measurer will travel in a vehicle which is allowed to see the path taken by the leading runners. Events such as the London Marathon use a milk float for this purpose.

In the 1990 Sun Life Great Race we were also allowed to move up and down the field, and the referee was able to indicate to athletes when they infringed the rule of the road. In the first few days there were one or two persistent offenders. Time penalties were then issued and runners soon learnt the error of their ways!

Whilst this cannot be done at all races, marshals en route should be briefed



On "open" roads where there is no coning, athletes should be instructed to stay, at all times, to the left of the centre of the road

PHOTO: ALLAN PEARSON

about the rule and told to not only show warnings but also report to the referee the numbers of any athletes who infringe this rule on "open" road courses.

Whilst there is an onus on the organiser to provide a safe course for the athlete, there must equally be a responsibility on the athlete himself, his colleagues and the race organiser, as well as those outside the sport.

Athletes have a responsibility to themselves as well as to the general public and must be encouraged (if necessary made) to conduct their sport in a way that is safe to all road users.

Should they not, then we know that the police and local councils will take such action as they feel is necessary to make life difficult, or impossible, for all race organisers.



# Using a Heart Rate Monitor in Ultra Training and Racing

by Andrew K. Jones

For the past few years, an interesting product for runners has been available on the market — the heart rate monitor. It consists of a strap that passes around your chest with a small sensor and transmitter that is best located just below your heart. The signal sent by the transmitter is received by a rather bulky wristwatch, which converts the signal into a display of your heart rate (in beats per minute). The chest strap takes a little getting used to, but you soon forget it's there. I find it easier to wear that watch on the inside of my wrist, as this makes the action of looking at my pulse closer to my natural arm action. The cost of this equipment is about \$150; if you want to go whole hog then you can spend \$500 and buy a unit that saves all the pulse information from a run, for downloading to a computer program such as Lotus 1-2-3.

In order to use this device properly it is necessary to have a treadmill test conducted; this is available at most universities. The test you need to do is a "Low power max  $\text{VO}_2$ " test. During this test the treadmill will be run at increasingly faster rates, starting at a moderate jog and ending with flat-out running; typically, the speed will be increased every three minutes. Your exhaled air is continuously monitored, and a blood sample is taken every three minutes. The results of this test will provide you with three pieces of information: your pace, your heart rate, and your blood lactate. My readings were:

Time (min)	Speed (km/hr)	Speed (mi/mi)	Pulse	Lactate (mM/l)
3	13	7:25	134	1.8
6	14	6:53	139	1.4
9	15	6:26	147	1.4
12	16	6:02	158	1.6
15	17	5:40	168	2.2
18	18	5:21	172	3.3
21	19	5:04	182	5.2
23	20	4:49	184	8.4

There are two key pulse rates that you now will know. Let's call them the *energy limit* and the *speed limit* as they apply to ultrarunners. The speed limit is important in training, the energy limit in long aerobic events such as ultrarunning. My speed limit is about 172 beats/minute which I reach at 18 km/hr (11.2 mi/hr), my energy limit is 154 beats/minute which I reach at 15.5 km/hr (9.3 mi/hr). The speed limit is the pace at which you exceed four millimoles/liter of lactic acid in your blood stream; this is considered to be the threshold between aerobic and anaerobic running. The energy limit is the fastest pace at which there is no anaerobic contribution whatsoever.

During training for an ultra event it is important to do some speed training, but because of the high stresses you put on your body during high mileage weeks this speed training should be closely monitored. I have found that if I do not exceed my speed limit then I can do effective speed training without feeling sore or overly tired the next day. For me a typical speed-limit workout is six times one mile in 5:10 to 5:15/mile, or a fartlek run of 15 minutes hard, five minutes easy, 15 minutes hard. I wear the heart rate monitor during these workouts and closely watch my heart rate. By training at your speed limit you can actually increase your speed at the same pulse rate; during the past summer I was able to decrease my mile-repeat times from about 5:15 to 5:05, while running at the same pulse rate.

During a race you use the heart rate monitor in a totally different way. The most important aspect of an ultra is energy: you must carefully monitor your expenditure of energy so that you can cover the distance in the quickest time. Fast early running rapidly depletes your energy stores and leads to early retirement or a "death march" at the end. If you run faster than your energy limit, then you are not making the most efficient use of your available energy stores. Some of your energy will be produced by converting glycogen to lactic acid, a sort of energy short-cut, instead of converting the glycogen to  $\text{CO}_2$  and water. The production of lactic acid has a number of adverse effects: it reduces your ability to use fat as a fuel source due to acidification of the blood, it causes increased fatigue and soreness of your muscles, and it wastes energy by not completely burning your fuel.

It is basically impossible to run more than a marathon without using fat as a fuel, so that by running at a pace that is faster than your energy limit, your body essentially runs out of useful fuel. The effect is a sudden fatigue that indicates exhaustion of your glycogen stores, also known as "hitting the wall." By keeping below your energy-limit pace, you ensure that you are proceeding at the maximum sustainable rate while making most efficient use of your energy stores.

Unfortunately there are a number of complicating aspects that could still cause you to slow. Perhaps at your energy limit pace you cannot eat and digest fuel; I have no experience with this, as I do not eat during a run. I do know that I can effectively digest full strength Conquest Thirst Quencher at my energy-limit pace. If it is not possible for you to eat and digest food at this rate, then this would be too fast a pace for races lasting longer than eight to ten hours, as I believe the use of just replacement fluids is limited to races of this dura-

tion. A second limiting factor is mental fatigue — even though physically you may be capable of maintaining your energy-limit pace, it becomes increasingly difficult in a longer race to maintain concentration and a positive outlook. This is what often determines the winner between a group of physically similar runners who run intelligent races.

I wore a heart rate monitor during the 1991 Mardi Gras 100 Km in New Orleans. As I stated earlier, my energy limit is 154 beats/minutes, which corresponds to 15.5 km/hr. My plan was to maintain as close to 154 beats/minutes for the entire race. If I was successful at this, then I would finish the race in a new North American record of 6:27:00. During the first half of the race, I looked at the monitor about once every five minutes; it was consistently between 151 and 157 beats/minutes. The highest reading occurred during a few stretches into a 15 mph head wind. Whenever I had a reading over 154 I slowed a little; under 154, I sped up a little.

I reached the halfway turnaround in 3:11:05, a little under pace. On the return trip I maintained 151 to 155 beats/minutes until 75 km, when I no longer had to hold myself back. From 75 km to 90 km I had a few stretches where my pulse dropped below 150, as mental fatigue was setting in. At 90 km I picked the pace back up and held a pulse rate of between 150 and 153. It was interesting to find that my pulse was still related to my pace in exactly the same way as at the start of the race.

I reached the finish line in 6:33:57, a little slower than predicted but still a new North American record by three minutes. I think I was slower than my predicted time for two reasons: first, there was a moderate wind during the race, sometimes a head wind, sometimes a tail wind, the net effect of this wind causing a slowdown of about five seconds/mile (about five minutes over 100 km); secondly, the stretch between 75 km and 90 km where I slowed down was a mental problem rather than a physical problem — I lost two or three minutes in this stretch. Adding these two corrections together you arrive almost exactly at my predicted pace of 6:27:00. The only problem I had with the heart monitor was a little bruising on my ribs; there was no chafing or irritation.

In summary, I believe the use of a heart rate monitor to be a very effective tool in separating perceived versus actual effort in an ultramarathon. Often the excuse for an early fast pace is: "I felt good." If this early pace is above the energy-limit pace, then a runner will probably pay for it later on in the race. At the end of a race the monitor is a useful tool for focusing your effort, by trying to keep your heart rate up. During training it is useful in correctly targeting your workout intensity to ensure effective training. The pulse monitor was instrumental in ensuring that the first 100-km I finished was a successful and not overly destructive experience.





# FÉDÉRATION FRANÇAISE D'ATHLÉTISME



Dr J.F DELASALLE  
président CTM/FFA

B.P 25  
80800 Corbie  
FRANCE

tél: 22.96.86.17  
fax: 22.48.20.10

Corbie le 1/2/92

à Mr Pete RIEGEL

RRTC / TAC

Dear Peter,

Thanks for sending the article on the US 100k record of A.Jones (by the way I thought A.Jones was Canadian ?)

I am surprised that his record might be rejected for using a heart rate monitor for I do not know any rules forbidding that kind of item.

It has nothing to do with a human external help but it is a personal help.

If this is really forbidden, one should also forbid athletes to use a chronometre watch that tells them their split times...

Why not ?

Personnaly I am willing to accept any personal method enabling an athlete to improve performances (except for chemical doping of course).

Could you send me the article about that rule forbidding the use of heart monitors, if that rule exists for it is important that athletes should know about the right or interdiction to use it.

Please note that in France the use of these items is accepted during competitions however they seem more useful to me while training than during competition.

I also know several international athletes who have used these items in important events without any problems : e.g Annette Sergent who won the cross country world championship twice while using a heart monitor. I saw her heart line which was practically a constant rhythm of 190 b/mn during the whole race.

Best regards,

Jean François DELASALLE

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 (office)  
FAX 614-424-5263

February 19, 1992

Dr. J. F. Delasalle - B. P. 25 - 80800 Corbie - FRANCE

Dear Jean-Francois,

Yes, Andy Jones is a Canadian. The possible record in question is a US All-Comers record, for the fastest run on US soil, by anybody from anywhere.

Below is the text of TAC Rule 66.1:

**RULE 66**  
**ASSISTANCE TO ATHLETES**

1. Except as provided in road races (Rule 132) and in long distance walking events (Rule 150), during the progress of an event a competitor who shall receive any assistance whatsoever from any person may be disqualified by the Referee. "Assistance" is the conveying of advice, information or direct help to an athlete by any means, including a technical device. It also includes pacing in running or walking events by persons not participating in the event, by lapped competitors, or by any kind of technical device. It does not mean participation of an officially designated pacesetter in the race. Men and women shall not be considered to be in the same event.

*NOTE: Pacesetting by a person entered in an event for that purpose is permitted.*

At first I believed that the rule had been violated. However, it was pointed out to me that the first sentence prohibits a competitor from receiving assistance from "any person." The second sentence defines assistance. Jones did not receive assistance from "any person" and therefore the letter of the rule was not broken, as I now read the rule.

I am not sure what IAAF rule, or Canadian rule, if any, may have been broken.

I believe heart monitors do not belong in competition, although they are fine for training. They are different from a watch. A watch conveys information concerning things outside the athlete, while a heart monitor tells the athlete what is going on inside his own body.

Long-distance racing depends strongly on the athlete's ability to measure out his energy in an efficient way, and I believe the heart monitor, or any other device that replaces the athlete's pace sense, gives an advantage to the athlete who uses it.

I realize opinions may differ on this, and I will publish your letter in Measurement News so that we can begin to collect opinions and see what people think about it. This is sure to be discussed at the TAC Convention this year.

Thank you for writing.

Best regards,



614-424-5263

\$25,000  
Total Prize  
Money

Pete  
Riegel

# Run With The Best.

America's Richest Ultra  
**The Houston UltraMarathon**  
50K & 50 miles  
1992 GAAC UltraMarathon Championships

1992 Houston  
**Ultra  
Marathon**




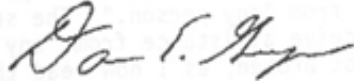
To all 1992 Houston Ultramarathon Entrants

The 1992 Houston Ultramarathon is sanctioned by the Athletics Congress of the USA (TAC) and follows the TAC/USA Competition Rules for Athletics. In accordance with RULE 66, Assistance to Athletes, which states: "...during the progress of an event a competitor who shall receive any assistance whatsoever from any person may be disqualified by the Referee.

'Assistance' is the conveying of advice, information or direct help to an athlete by any means, including a technical device," and in accordance with IAAF rule 143 in the IAAF Handbook, it is the judgement of the Race Director and Dave Gwyn, TAC Official and Referee of the 1992 Houston Ultramarathon, that heart rate monitors of any kind will not be allowed during the race. Any athlete wearing such a device may be disqualified. The aim of this TAC/USA rule is to avoid any situation which may give an unfair advantage to one competitor over another.

Sincerely,

  
Michael Fred, Race Director

  
Dave Gwyn, Referee

cc/Dan Brannen, Chairman, Ultrarunning Subcommittee  
Basil Honikmen, Chairman, Records Committee of TAC/USA  
Bob Hersh, Chairman, Rules Committee  
Tom McBrayer, Texas/Louisiana certifier  
Andy Milroy, IAU Technical Director  
Don Kardong, Chairman, Men's LDR  
Julie Emmonds, Chairperson, Women's LDR  
Charles R. DesJardins, Chairman, Master's LDR

Official Sponsors

  
Mahatma  
BROWN RICE

  
Success  
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Continental  
Airlines 

Weather Conditions for the 1992 Barcelona Olympic Marathons:

In the past several months there has been considerable concern about the possible extreme hot and humid weather that may prevail during the 1992 Barcelona Olympic Marathons. The women's marathon is scheduled for July 31st, and the men's race is to be held on August 10th, 1992.

The information available so far has been based on the average temperature and humidity recorded in the last 20 years. In any event, this can give only but a rough estimate of the weather conditions. In order to obtain a more accurate information and better prediction, the Heat Vs. Exertion monitor was used during the Spanish Race Walking Championships (20 Km) which was held on August 4, 1991. The course was that of the Olympic Race Walking competition and very similar to that of the Olympic Marathons. It was a flat course, with the last 2 Km consisting of an uphill slope leading to the Olympic Stadium.

The Heat Vs. Exertion (HVE) monitor measures the following parameters:

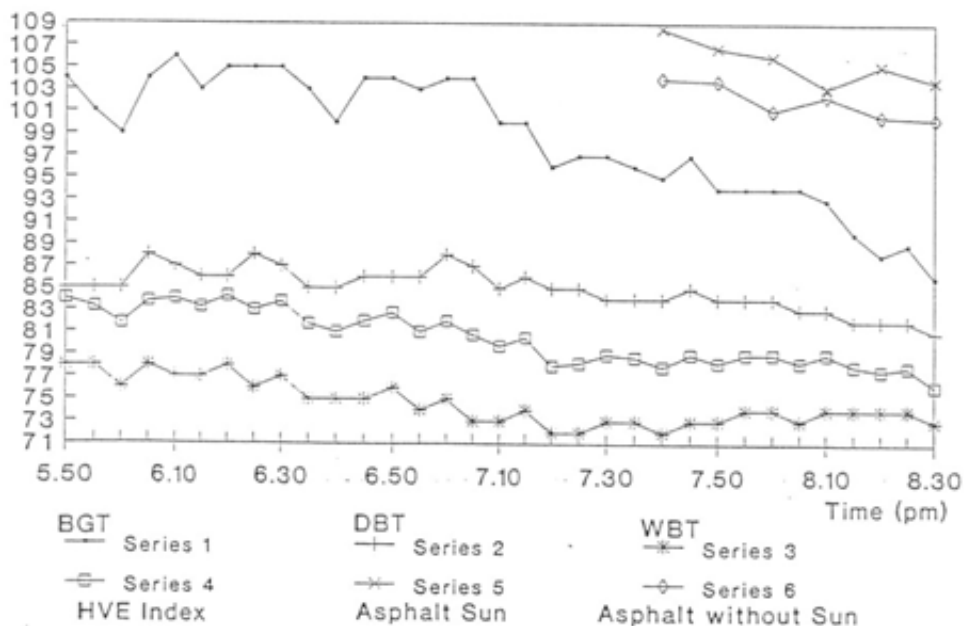
- DBT: Dry bulb temperature (ambient temperature)
- WBT: Wet bulb temperature (humidity and wind velocity)
- BGT: Black globe temperature (Sun surface radiation)

The HVE is the weighted average of all the above readings: with DBT contributing 10%, WBT 70% and BGT 20%.

The following graph depicts the results obtained by Dr. P. Pujol and Dr. Ing Joan Verdaguer. The readings were made at frequent intervals, and the starting time of the competition was the same of the Olympic marathons (6:00 PM). The results closely reflect the conditions that will most probably exist at the time of the Olympic marathons.

COULD BE  
A HOT ONE!  
THIS RACE  
HAD 85°F,  
60% R.H.

Race Walking Spanish Championship 20km



SOURCE : INTERNATIONAL MARATHON  
MEDICAL DIRECTORS ASSOCIATION (IMMDA)  
NEWSLETTER - DECEMBER, 1991

date: August 4, 1991

## WHAT TO EXPECT FROM AN AIRLESS TIRE

The first solid tire I saw belonged to Bob Letson of San Diego. Out of 13 riders who measured the 1984 Olympic Marathon course, he was the only one of us with a solid front wheel. Most of us were worried that, on this never-to-be-repeated ride, we would get a flat. Not Bob. His tire had something like a garden hose inside it. We later saw that his calibrations did not vary nearly as much as did ours, with pneumatic tires, as the temperature and rain changed the measuring conditions.

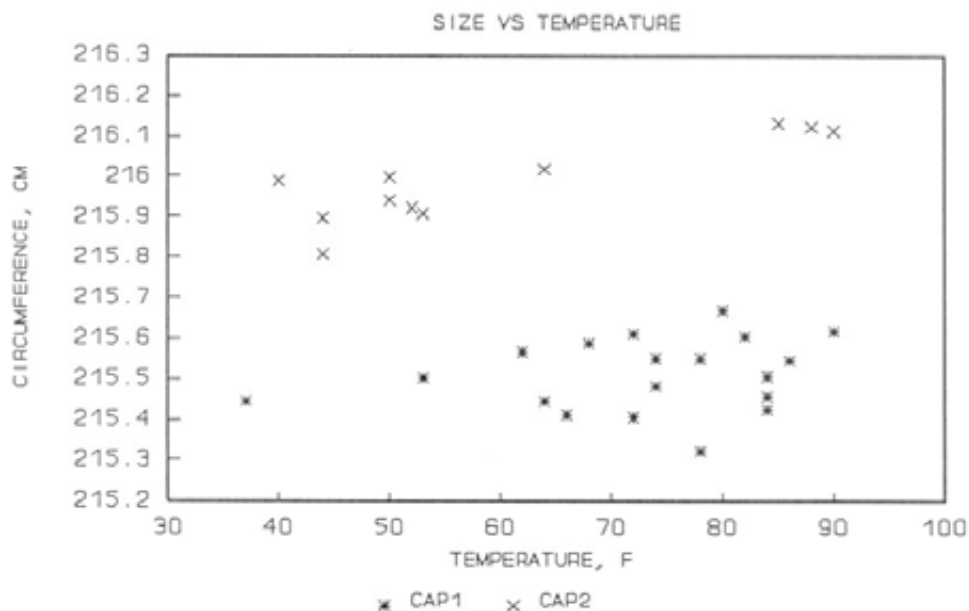
The Eliminator, a later solid tire, was a piece of stiff plastic tubing inserted inside the tire in place of an inner tube. It worked, but gave a harsh ride.

John Disley gave me a wheel with a Suretrak tire on it several years ago. It was a terrific wheel - it had a decent ride, it was airless, and its calibration remained reasonably stable as conditions changed. Unfortunately, Suretrak went out of business, so it was the last of its breed.

Some time later Tom Knight told me about Capair. I investigated, and found that they had obtained the old Suretrak molds and were producing tires. I wanted to buy one, but did not know what size I should get, so I got a 27x1 1/4, which was the same size as John's Suretrak. Then I was able to buy a rim and have it mounted. I used that wheel for 6 months or so, then made a measuring wheel out of it and gave it to John.

I now have my second Capair. I bought another 27x1 1/4 tire, and again had the bike shop fit a rim to it. It rides well, rain or shine. I like it a lot. Below you will see how little the wheel size varies with temperature. Note that 0.2 cm of circumference is about 0.1 percent, or roughly 9 to 11 counts/km.

## CAPAIR TIRES



THE ATHLETICS CONGRESS  
OF THE USA

3354 Kirkham Road  
Columbus, OH 43221

Road Running Technical Committee  
Peter S. Riegel, Chairman

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

January 7, 1992

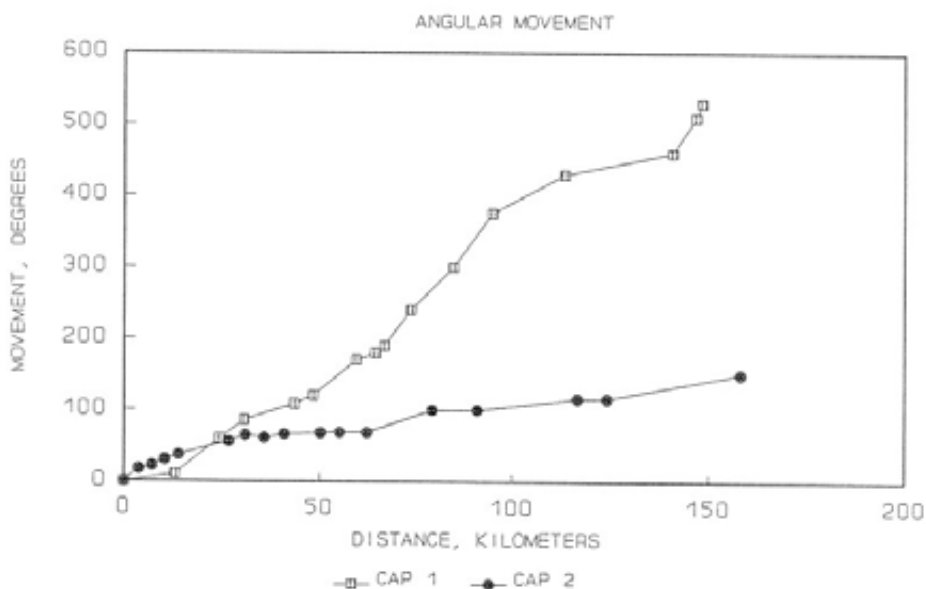
To: Bob Baumel, Wayne Nicoll, John Disley

Subject: Solid Tire Creep

I've been through four solid tires now. The first was the Eliminator, the second was a Suretrak that John gave me, and the last two were Capair tires. After using the first one for a while, I made a walking wheel out of it and gave it to John, and got my present Capair.

For some reason I wondered about whether the tire crept on the rim, and started to keep data on the Capairs. Here is how things came out:

## CAPAIR SOLID TIRE

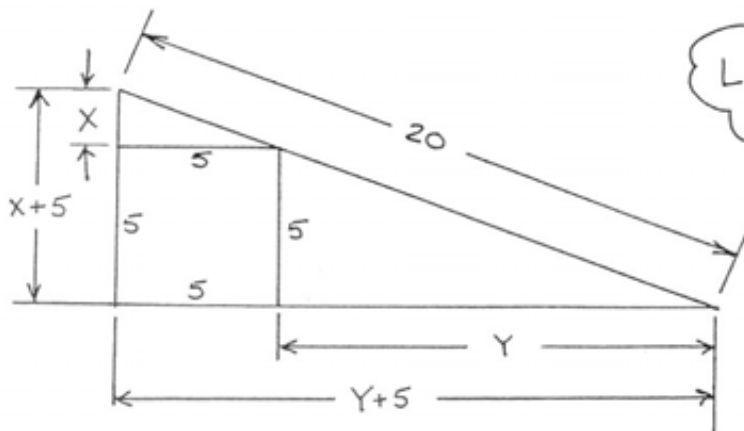


My present one doesn't seem to creep as much as the first, and neither creeps enough to keep me awake nights. The direction of creep is such that the tire moves clockwise relative to the rim. For example, in 150 km of riding, my first Capair tire made two more revolutions than did the rim on which it was mounted.

Do any of you have any similar data? I wish I'd done this with my Eliminator

Best regards,





LAST MONTH'S  
PUZZLE

- ① BY SIMILAR TRIANGLES,  $x/5 = 5/y$  OR  $xy=25$   
 ② BY PYTHAGORAS,  $(x+5)^2 + (y+5)^2 = 20^2$

EXPANSION AND COMBINATION OF ① AND ② YIELDS:

$$x^4 + 10x^3 - 350x^2 + 250x + 625 = 0 = f(x)$$

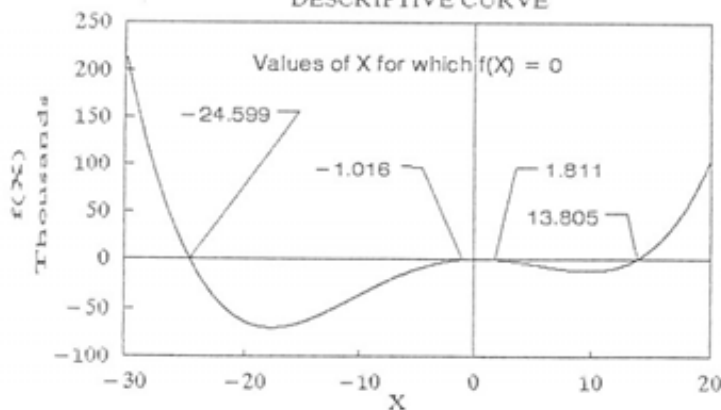
TRIAL AND ERROR SOLUTION YIELDS:

$$x = 1.811, 13.8045, -1.0163, -24.5992$$

IGNORING NEGATIVE VALUES, THE ELEVATION OF THE LADDER'S TOP IS  $x+5$ , OR

$$\boxed{\text{ELEVATION} = 6.811 \text{ OR } 18.8045}$$

### BRIAN SMITH'S LADDER DESCRIPTIVE CURVE



# Bartow Superintendent's 5k (5,000 meters)

TAC certification measurement by Ed Okie 12/28/91

Lake Wales, FL 33859 (813) 676-1374

Start line is on the east side of Broadway 21'-1" north of utility pole #359 on opposite side of road. It is also 22'-3" north of seam on curb by "No Parking" sign. Paint stripe and nail/washer mark point.

Mile 1 is 7'-6" south of utility pole in island in front of home #1245 on First St; or 18'-8" south of south edge of walkway leading into home #1245. Paint stripe and nail/washer mark point.

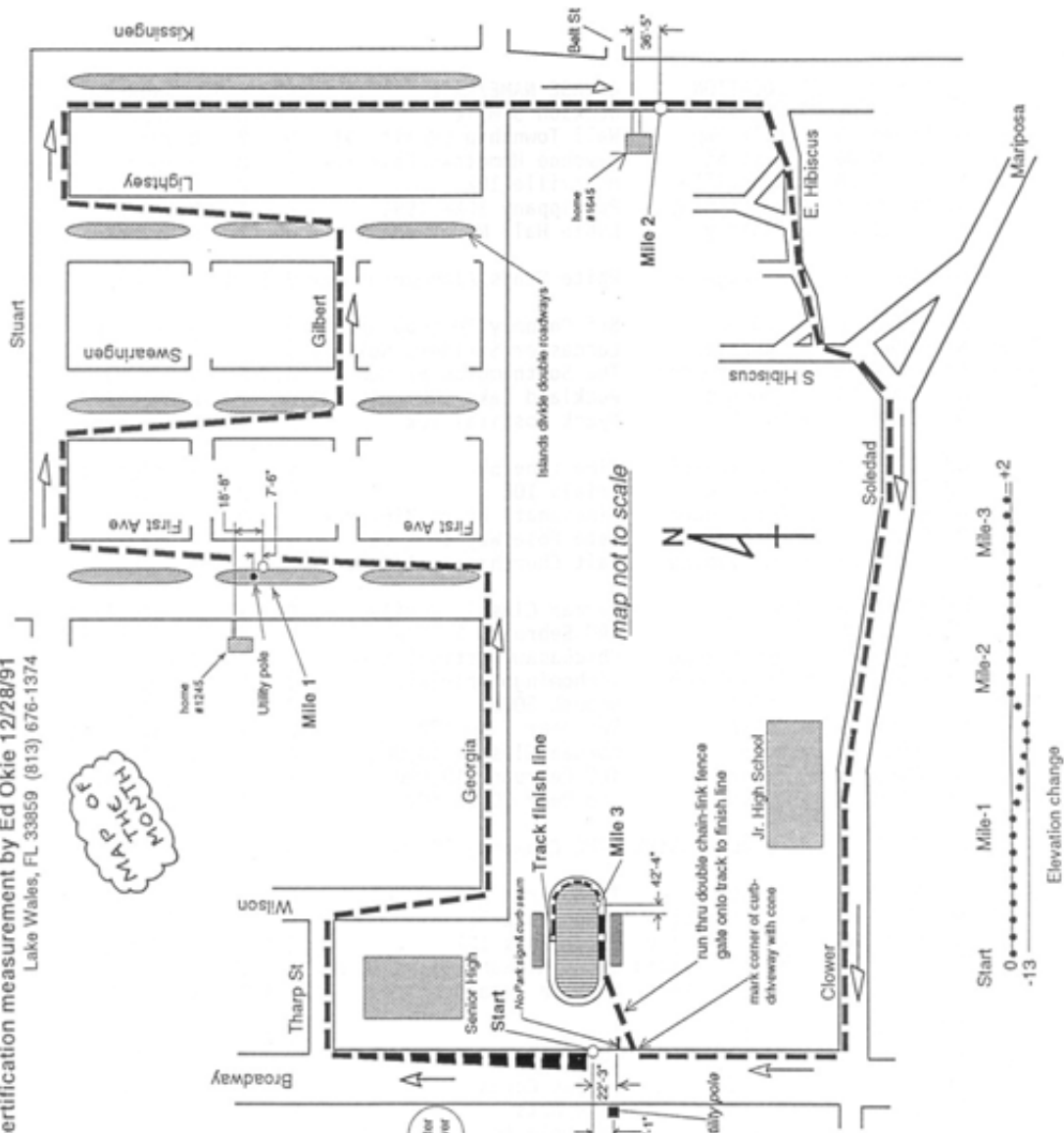
Mile 2 is 36'-5" south of north edge of driveway at home #1645 Kissingen. Paint stripe and nail/washer mark point.

Mile 3 is in the southeast corner of the track 42'-4" east of east end of 3' vertical stairway cement wall. It is marked on pavement by two white dots next to grass. Mark curve toward finish line with cones placed on grass immediately next to pavement.

Finish line uses the track's normal finish line already painted on the track centered in front of the home-side bleachers.

## Safety notes:

1. Prior to Mile-1 post, three way street stop on Georgia before turning onto First St should be manned by a citizen traffic controller as a cautionary measure.
2. Intersection of Kissingen and Georgia before Mile-2 is a thru street in opposite direction and is dangerous. Requires an official police car and officer.
3. As runners turn onto E. Hibiscus two slightly confusing road triangles lie ahead. Mark leading edge of each triangle plus several additional cones directing proper path.
4. E. Hibiscus onto S. Hibiscus runs through a stop sign and requires a citizen traffic monitor. Plus mark turn with cones, and next 45-degree right turn onto Soledad.
5. Intersection of Mariposa and Soledad (by SW corner of triangle) requires cautionary traffic management.
6. Curve in road on Clower just prior to arriving at Junior High School needs to be marked with 8-10 cones keeping runners in fight (north side) lane.





**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.

Bob Harrison  
3216 Herbert Drive  
Montgomery, Alabama 36116  
(205) 284-5214

February 4, 1992

Dear Pete:

I got the idea of trying to use a map measurer to help me lay out a course from one of Tom McBrayer's newsletters that was in MN a couple of years ago. I bought a Kartermesser and tried it for a while, calibrating it on the accompanying scales that come with maps. I had varying degrees of success with it; the inaccuracy of the scales that go with maps was the biggest problem. The Kartermesser measures to 1/4" increments and costs about \$25. A few months ago I misplaced it. When I went to buy another one, I decided to step up in class and bought an Alvin, which measures to 1/100 inch and works smoother. I took a city map of Montgomery, magnified it 1 1/2 times to make the measuring easier, but this time calibrated my measurer on one of our certified 5K courses instead of calibrating it on the scale attached to the map.

Using this method, I have been able to map out new courses on the map using my Alvin with enough accuracy that I feel confident that I don't have to go out and get a preliminary measurement of a course on my bike before going out to measure one for certification. I feel that it is accurate enough that the start and finish will be close enough to where the race director wants them.

The Kartermesser is German made, while the Alvin is Swiss made and costs about \$65. I would recommend the Alvin; I think the extra cost is worth it because it measures much more precise. (5Ks measure out to .83 feet on my map.) Both can be purchased at a surveyor's supply store.

I thought some of the readers of MN might be interested in trying this. I'll mention this in my next newsletter to the Mississippi clubs.

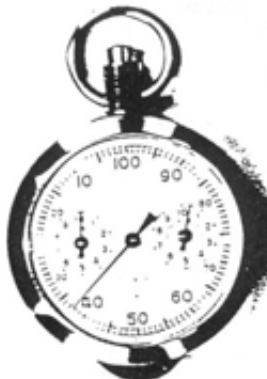
Whatcha think about it, El Maestro?

KARTENMESSER:

Sincerely,

P.S. Tell Joan I said hello.

ALVIN:



21



I HAVE AN  
OPIS O METER A LOT  
LIKE THE KARTEN-  
MESSER. I BOUGHT  
IT FROM BROOK-  
STONE. I USE IT  
LIKE BOB DOES.  
Pete

# METRO-DADE MARATHON

## 1992

RACE DIRECTOR - MICHAEL PEYTON 1 / 5 / 1992  
14625 SW 64 AVE., MIAMI, FL 33158 (305) 251-6689

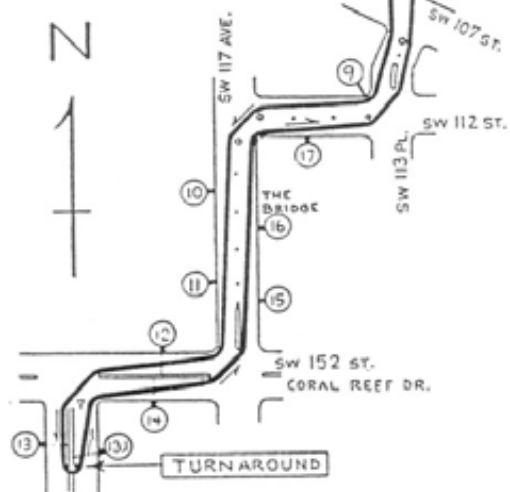
MEASURED FOR CERTIFICATION BY FRED SHIELDS  
13430 SW 78 CT., MIAMI, FL 33156 (305) 253-3449  
12/14/1991 CALIBRATION COURSE FL 89010.BH

**COURSE BOUNDARIES :**  
RUNNERS MAY USE  
ALL PAVED LANES IN  
THE DIRECTION OF  
THE NORMAL FLOW  
OF TRAFFIC.

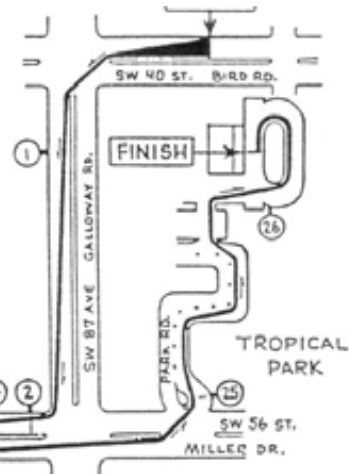
GOOD  
MAP  
AS ALWAYS  
FROM FRED

NOTE : START, FINISH, SPLITS,  
AND TURNAROUND MARKED  
WITH NAILS AND WASHERS.

- CONES AT LANE DIVISIONS
- RESTRICTING CONES  
MARKED WITH NAIL & WASHER  
AND PAINT (AT REFLECTORS)



METRO ZOO



START	ON SW 40 ST. 23' W OF LIGHT POLE 3886-67 ACROSS FROM NW ENTRANCE TO TROPICAL PARK.
MILE 1	ON SW 87 AVE. 79' N OF LIGHT POLE AT SOUTH END OF WALL AT 400.
MILE 2	ON SW 58 ST. 35' SW OF FIRE HYDRANT AT 8901.
MILE 3	ON SW 58 ST. 49' SW OF FIRE HYDRANT AT 9925.
MILE 4	ON SW 107 AVE. 29' N OF 1ST TELEPHONE POLE N OF SW 81 ST.
MILE 5	ON SW 107 AVE. 15' SE OF 1 TELEPHONE POLE S OF SW 78 ST.
MILE 6	ON KENDALL INDIAN HAMMOCKS PARK ROAD 72' E EAST OF PARK OFFICE DRIVEWAY.
MILE 7	ON SW 84 ST. 17' 11" S OF TELEPHONE POLE 8-8148-0485-07 AT THE PALACE.
MILE 8	ON PERIMETER ROAD 28' 4" SW OF 1ST LIGHT POLE N OF MOCC BATHING CAGES.
MILE 9	ON SW 112 ST AT SW CORNER OF INTERSECTION OF SW 113 PL. 4' 8" FROM END OF CURB.
MILE 10	ON SW 117 AVE. ON N SIDE OF BRIDGE 3' 3" SE OF STORM DRAIN.
MILE 11	ON SW 117 AVE. 84' 10" SE OF CONCRETE POST AT ENTRANCE TO PINE LAWN MEMORIAL PARK.
MILE 12	ON SW 152 ST. 28' 10" W OF EID OF MEDIAN AT ENTRANCE TO DEERWOOD TOWN CENTER.
MILE 13	ON METROZOO RD. 50' 2" NE OF LIGHT POLE 8-5843-8850-0-5.
TURNAROUND	ON METROZOO RD IN MEDIAN 55' 10" SE OF LIGHT POLE 8-5843-8745-00
MILE 13.1	ON METROZOO RD 82' 2" SW OF LIGHT POLE 8-5843-8847-00.
MILE 14	ON SW 152 ST. 45' 18" NE OF LIGHT POLE 8044- 3405-02 ACROSS FROM DEERWOOD TOWN CENTER
MILE 15	ON SW 117 AVE. 52' 2" SW OF LIGHT POLE 8-5044-6678-0-8 AT 14125.
MILE 16	ON SW 117 AVE. ON BRIDGE 152' 11" N OF S END OF PEDESTRIAN LAKE WALL.
MILE 17	ON SW 112 ST. 102' 10" NW OF TELEPHONE POLE 8-8046-7528-05 (2ND POLE E OF EHT, TO WOODLAWN SOUTH MEMORIAL PARK)
MILE 18	ON PERIMETER ROAD 102' 2" S OF END OF MEDIAN AT DELIVERY ENTRANCE TO MOCC GYM.
MILE 19	ON SW 112 AVE 87' 0" SE OF FIRE HYDRANT AT 11225-11231 N OF KENDALL DR.
MILE 20	ON SW 114 AVE. 23' 8" N OF MANHOLE .
MILE 21	ON SW 107 AVE. 23' 0" NW OF LIGHT POLE 8-8148-6-89802 S OF SW 78 ST.
MILE 22	ON SW 107 AVE. 140' 7" N of light pole across from intersection of SW 83 St. at 6241.
MILE 23	ON SW 58 St. (by median) 17' 11" E of end of median across from 10025
MILE 24	ON SW 58 St. (by median) 19' 8" SE of end of median at W side of intersection of SW 90 Ct. (at 9006)
MILE 25	ON Main Park Road 21' 10" SE of light pole at Miller Rd. entrance to Tropical Park
MILE 26	ON Tropical Park track 72' 2" SE of light pole at S end of grandstand
FINISH	On Tropical Park track at mile (440 YD) finish

## Down the road

By Cedric Jagers



# Cheated at the Races

*Be sure you ran the  
advertised distance*

She got cheated. She probably didn't know it. I didn't have the heart to tell her. She had just broken 1:30 for the first time in a half-marathon and her face was aglow with joy.

Too bad she hadn't run a half-marathon. The race called itself a half-marathon. But the organizers knew it wasn't the full distance. So they had cheated her as well as each of the 270 runners who finished their 13-mile race.

According to the guy who measured the course for TAC certification, it was found to be a full 10th of a mile short of the 13.1-mile half-marathon distance. A slightly different full-length course was measured out, but the organizers didn't want it. They wanted their 10K race and their "half-marathon" to start and finish in the same place.

It didn't matter, or at least wasn't important to them, that the longer race wasn't the full distance. That's a travesty. It wouldn't be so bad if they had started calling their race a "13-miler," but to continue to advertise the race as a half-marathon when they know it isn't seems. . . . You fill in the word -- "disingenuous" and some other less flattering words come to mind.

At this point, some causal runners may be saying to themselves, "What difference does it make?" The answer is: a lot. For the elite runners, records are at stake. No record can be set on any course that is not TAC certified.

But most of us are not elite runners nor fast enough to set records, right? Wrong. For every runner, personal records are at stake when you run a race. If you run a race that is short (not the full-length distance), it gives you a fake time for the distance. It makes you think you ran faster than you actually did.

It also gives you a false comparison time to compare with runners (your friends or competitors) who ran the full distance in a race somewhere else. You say to yourself, "I ran faster than that -- I'd have outrun that so and so."

How can you be sure a race is the full advertised distance? In my opinion there is only one way. The race has to be run on a TAC certified course, as it was measured. In other words, no shortcuts or detours. It can happen.

A course was measured and TAC certified a few years ago for the Charles Towne Landing race. During the race, a city council member decided she didn't want the race to go down her street. She blocked the street with her car and forced the police lead motorcyclists to detour down the next street. After the race, the organizers never claimed the runners had run the full 8K distance.

Look for the TAC certification number on the race application. What does a TAC certification number look like and what does it tell you? It looks something like this: SC87012BS.

The first two letters are the state abbreviation, so this would mean South Carolina. The first two numbers are the year the course was certified, so for this race, 1987. The next three numbers are just the order of certification, so this was the 12th race certified that year. The last two letters are the initials of the TAC official who checked the paperwork for accuracy and signed the certification certificate.

Some races, probably the ones that know accurate courses are important to a lot of runners, will use phrases like "measured to TAC standards" or "wheel-measured course" or the promising "will be TAC certified by race date." Or the false "TAC certification pending" -- a course is either certified or it is not. There is no "pending" status. Maybe these courses are accurate. Maybe they will be TAC certified by race date. Maybe. Want to be sure? Check with the TAC certifier for your area.

There is a rule of thumb some of us use that works most of the time. If it is not TAC certified it is probably a short course. This makes some race organizers angry despite its truth. The race exceptions (there are some races that actually are measured to TAC standards but never submitted for certification because the organizers don't want to go to the trouble and expense) only go to prove the rule.

I could call the name of one of my favorite 5K races, which when measured for TAC certification turned out to be 150 yards short. A 5K is three miles and 189 yards long. So which distance should the race have called itself, three miles or 5K?

Or my 10K best on an uncertified course that is minutes faster than my real 10K best on a certified course. How could that happen? Well, if the car they used to measure the uncertified course only measured nine-tenths of a mile when the odometer showed a mile, then the course was at least six-tenths of a mile short. That's more than half a mile. How long does it take you to run half a mile?

Does it matter to you if your race is the right distance? If it does, let race organizers know. They will get their course TAC certified if enough runners demand it.

Let's demand accurate courses. Let's stop getting cheated out of the full distance at races. What's that again?

"If it isn't TAC certified, it's probably short."

PART 1:



PART 2:



INTERESTING TRICK OF THE MONTH

This illustrates a way to handle a complicated course that makes multiple non-identical loops over the same set of roadways. A normal map can get very confusing. Dan Brannen had such a course in the Rubin Half Marathon. As you can see, Dan drew a background map showing all the roadways used, and used it as background for two maps. One map shows the course from start to mile 6.9, terminating in (\*). The second map begins with (\*) and continues to the finish.



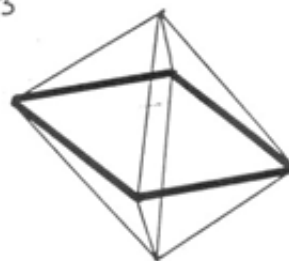
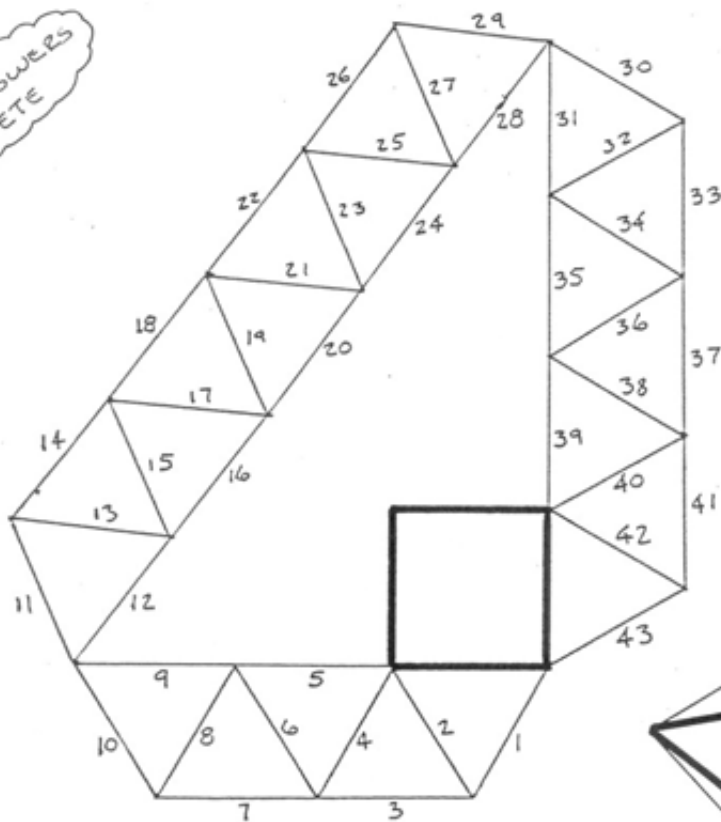
## BRACING THE SQUARE - A PUZZLE FOR THE WHOLE YEAR

Your task is to brace a square - that is, to build a rigid structure around it so that the square cannot deform into a parallelogram. The following conditions apply:

- 1) The square is exactly one unit on a side.
- 2) The links used for bracing are exactly one unit long. No approximations!
- 3) You may not go out of the plane nor into the square. This is a two-dimensional problem.
- 4) Links may not cross each other, and may be joined only at their ends.
- 5) The links forming the four sides of the square do not count as bracing, but may form part of the structure.

Below is an obvious example of one way the square can be braced, by building it into the corner of a 3-4-5 triangle. This uses 43 links. It can be done using fewer links. The person who submits the solution using the fewest links will be each month's winner. The current best answer will be shown in each issue until no improvement is made - and then I will show the best answer I have seen. Take your time on this one.

SEND ANSWERS  
TO PETE



A 3 DIMENSIONAL  
ANSWER