Measurement News

November 2003 • Number 122

Measurers encounter many obstacles during the course of their labors. Jim Gerweck, Carol Kane, and Pete Volkmar (above) found this police crusier parked in the middle of their calibration course at a measurement in Fairfield, CT. Unfortunately, a mannequin was seated in the driver's seat and a fake radar unit was attached outside — the car was a dummy unit used to scare drivers into going slowly. After half an hour a live officer arrived to move the vehicle off the calibration course. The trio of measurers could have solved the problem by establishing a cal course on the other side of the road, using the offset method. Two variations of this technique are reprinted in this issue

MEASUREMENT NEWS

#122 – NOVEMBER 2003

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ABOUT MEASUREMENT NEWS

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

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

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

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

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

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

Deadlines: Material intended to be included in the January 2004 issue must be in the Editor's hands by December 20. Next issue will be mailed in early January.

ROAD RUNNING TECHNICAL COUNCIL

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Visit the RRTC website at:

http://www.rrtc.net

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

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

ONLINE MEASUREMENT FORUM

All it takes to become a subscriber is access to email. Simply send to **mnforum-request@rrtc.net** with “subscribe” as the subject (to unsubscribe, use “unsubscribe” as the subject).

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

* * * * * * * *

Chairman's Clatter - From Mike Wickiser

It seems like just yesterday I was writing about the RRTC meeting in Akron and the upcoming debut of the Akron Road Runner Marathon. Well that is all history now and it is time once again to discuss the latest happenings.

Women's Olympic Trials Validation: The Ladies are preparing to go to St. Louis as soon as the paving crews finish up with new curbing and repaving roads in the Forest Park section of the course. Like the Men's Trials, the Women's course consists of a Start segment followed by several (3 plus) repeated loops then a short segment to the Finish. Tom Eckleman, course measurer has been checking the course regularly so the Validation can get going as soon as possible. Pete Riegel has put together an Excel spreadsheet similar to the one used for the men's Trials to make the number crunching go much easier.

USATF Convention & RRTC Meeting: With the RRTC meeting having already taken place on Labor Day much of our annual business has been conducted. There will be at least one RRTC meeting at the convention to review the Akron meeting minutes as well as provide an open forum for convention attendees. Any agenda items are welcomed.

Dueling Marathons: I thought the second weekend in October would be Marathon overload for the Akron area. The Akron Road Runner Marathon debuted Saturday morning October 11, 2003 and the Towpath Marathon held its 12th annual race the following day. It would appear that two Marathons within 24 hours and courses that come within 3 miles of each other would be disastrous for one or the other race. What happened was a banner weekend for Marathon running.
The Akron Marathon missed its goal of 5000 runners but did have a huge turnout of something like 3000 participants and the Towpath Marathon set a new attendance record as well. I am still shaking my head, but hey it goes to show what good promotion can do for a race. Both races were great successes and both are busy planning for next year.

FROM THE ARCHIVES

The saying goes, "there's nothing new under the sun." Although PDAs, GPS, and computer programs have modified the face of measurement, the basics of the process remain pretty much unchanged. Thus, there are topics and techniques from the early years of the course measurement system that can still prove of interest and benefit to measurers in the 21st century. Indeed, some of these time-worn techniques will appear as new and innovative to many, as they often have to me. Therefore, from time to time, items from past issues of *Measurement News* will be reprinted, in the hope that the knowledge of the past can benefit the measurers of the present and future.

The following two articles appeared in *Measurement News* Nos. 10 & 11. The first is from Pete Riegel, the second from Bob Baumel.

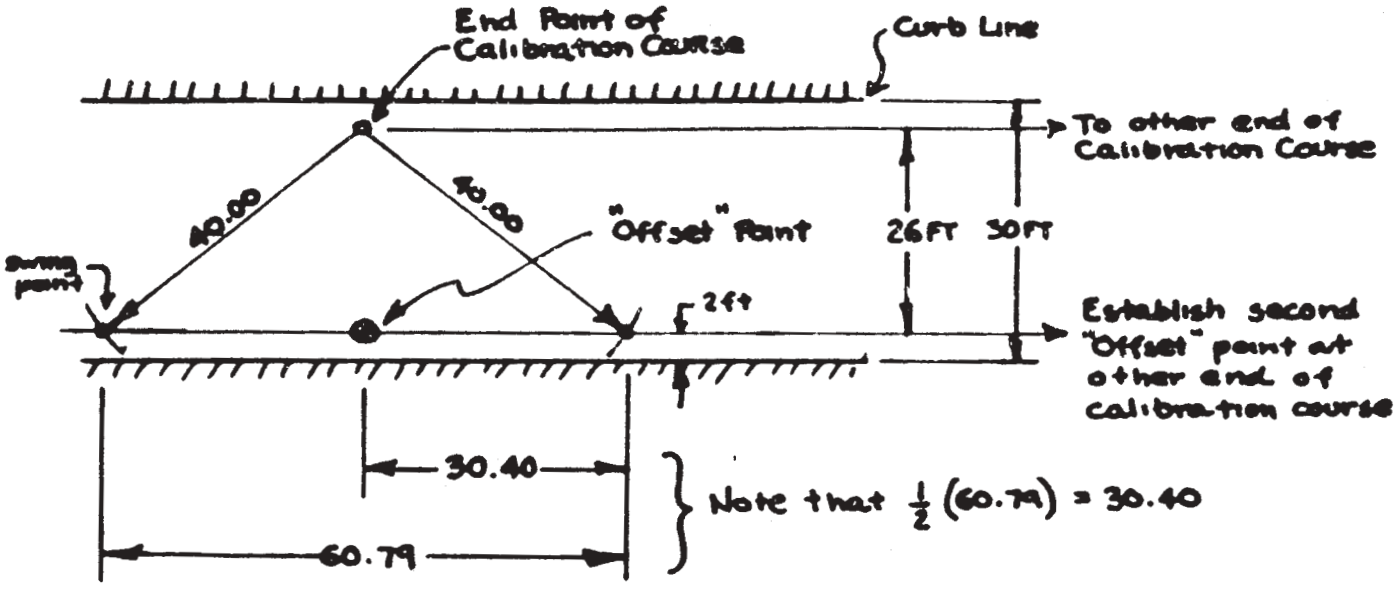
PARALLEL CALIBRATION COURSES

It's legal to ride on the right. Unfortunately, many calibration courses are located on one side of a road, so half the calibration rides must go in the wrong direction. This makes drivers mad and can cause anxiety to the rider.

Parallel calibration courses can make life easier. If there's a set of marks on each side of the road, then all riding can be done legally. Here are some options to produce parallel courses:

1) If you're using an EDM, just move across the road and take another shot. Since this is quickly done it's no big hassle.

2) If you're using a steel tape, you can do what's called a <u>swing offset</u> by surveyors. If done with care it's accurate, and can be done using only a tape. It is an accepted surveying procedure. See the diagram below to see how it's done.



a) Establish end points of course by direct measurement.

b) Measure the same distance (the "swing" measurement) from the end point to two end points across the road, in opposite directions from the end point. Be sure the two points are the same distance from the edge of the road or curb. The measured distance should be about 1.3 to 1.5 times the width of the road. In the example, my road was 30 feet wide and I used 40 feet as the swing measurement.

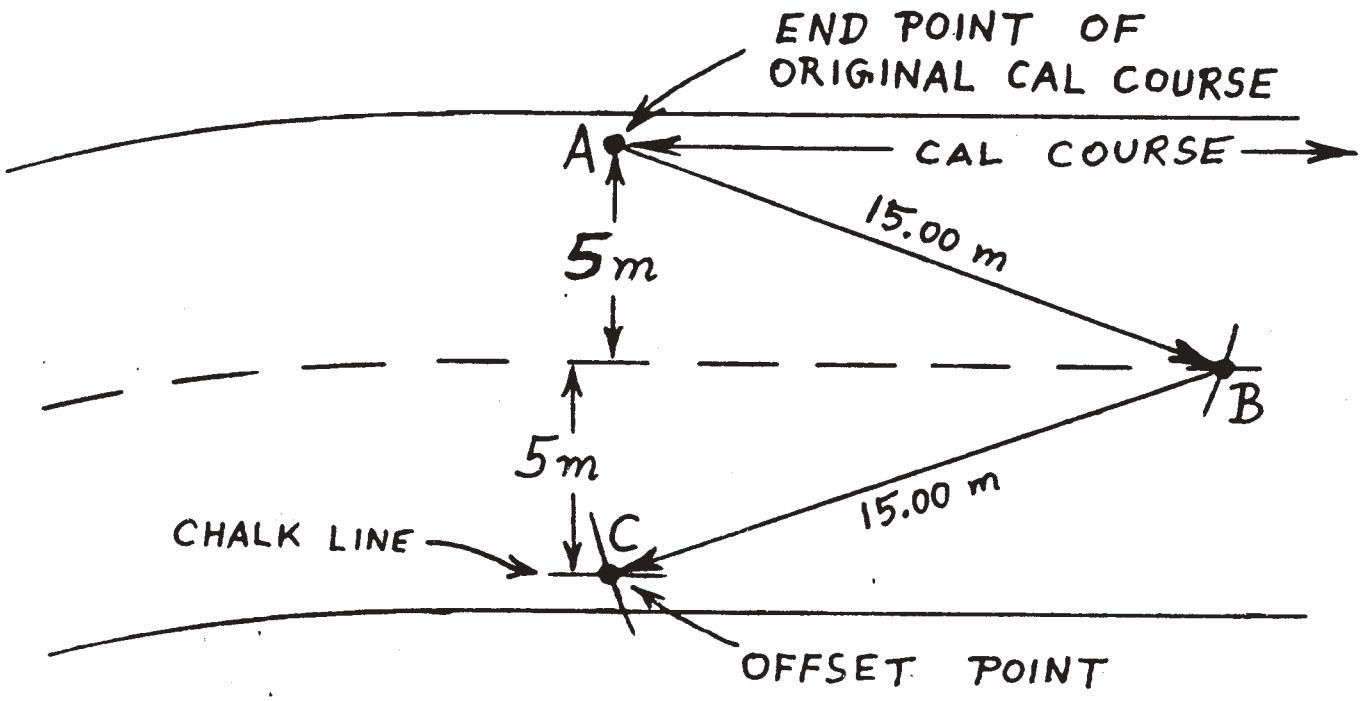
c) Measure the distance between the swing points. In my case it's 60.79 feet.

d) Mark the midpoint ("ofset" point) between the two swing points. In my case the "offset" point is 30.40 feet from either swing point.

e) Go to the other end of the course and do the same thing. The two "offset" points will be the same distance apart as the original ends of the calibration course.

ALTERNATE METHOD FOR LAYING OUT PARALLEL CALIBRATION COURSES

The "Swing Offset"method presented by Pete Riegel . . .looks very useful. But there are cases where it wouldn't work. For example, in the diagram below, point "A" is the left-hand endpoint of a calibration point that extends off the paper to the right. We'd like to construct a parallel cal course whose left-hand endpoint is "C". But Pete's method won't work because the road is curved to the left of point "A". You'd have similar problems if the road narrows or widens to the left of point "A"(e.g. if there's an intersection), or if the road is uncurbed and the edges don't form good straight lines.



The following variant of the method uses the CENTER-LINE instead of the road edges to guide you, and doesn't require the road to continue in a straight line past the ends of the calibration course. The accuracy ought to be similar to Pete's method.

Procedure:

1) Measure the distance from point "A" to exact center-line of road (e.g. center of painted line). In this case, it is 5 meters. Since the "offset" point "C" that we will eventually construct will have to be this same distance from the center-line (but on the other edge of the road), draw a chalk line on the road, parallel to center-line, and 5 m from center-line, and long enough to include the ultimate position of point "C".

2) From point "A", do a swing measurement to point "B" on the center-line. In this case, the swing measurement is 15 meters (at least 3 times the distance from "A" to the center-line).

3) From point "B", do a second swing measurement, of exactly the same length (15 m) to determine the offset point "C" along the chalk line already drawn in step 1.

Measurement of the Month

Mike Wickiser

AKRON ROAD RUNNER MARATHON

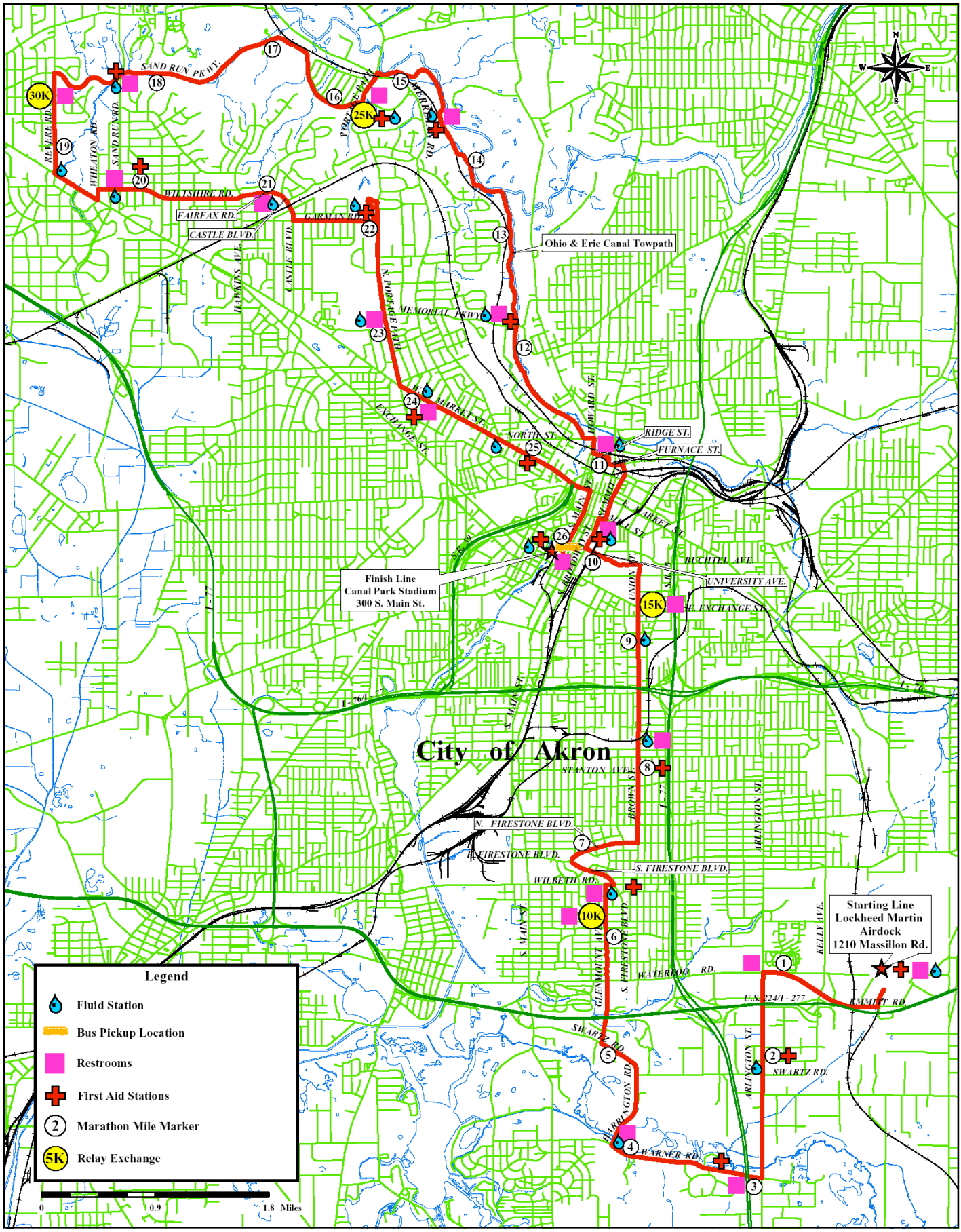
AKRON, OH

I was first contacted to measure the course for the Akron Road Runner Marathon last summer while my arm was in a sling recovering from rotator cuff surgery. As with every measurement I asked for a course description, map, and for the race director to think about where the course could be adjusted. The course designer and RD assured me the course would be pretty darned close. Since the Start was located inside the old Goodyear Airdock where the blimps were built and the finish was inside the Akron Canal Park baseball stadium and there was no turnaround point on the route, I chose to measure the course length and not bother with any mile or km splits. It was advantageous in that the course was close to home so there was no need to finish the whole measurement in a single outing. This proved a huge benefit as the course length was about half a mile short and a special time had needed to be set up for measurement within the Airdock area, the Finish inside the Canal Ballpark and for the segment within the prior Seiberling mansion, Stan Hywett.

In all, the course was measured in 7 separate outings consisting of 66 double measured sections using available landmarks rather than any mile or kilometer splits. After determining the needed length for full marathon distance my wife Karen & I pored over scale maps of Akron looking for ways to lengthen the course. Meeting with the Race director and two of the course designers a few other alternatives were discussed and it was time to get back on the bike and check the alternatives. By now it was December and the temperature was below freezing. I had to walk the bike along one section to avoid slipping on the ice at the edge of the roadway. All worked out well, the course length was a bit long and the Start line got moved forward slightly to set the length at 42.195 km.

What still remained were all the intermediate splits to be set and documented. With the USATF Marathon Team National Championships being held as part of the race, I felt it was important to certify each 5km along the route and set the miles

Road Runner Akron Marathon Course - October 11, 2003



Map Created By Wendy Doyle (City of Akron - Engineering Bureau)

accurately but not certify them. Having all those segments measured made the intermediate splits go pretty easily although it was necessary to ride the bike over the gravel towpath trail in places covered with snow. Don't ask me about measuring on snow. Most of the measuring was done walking the bike from trail markers. It was just necessary to ride the towpath trail from point to point and it wasn't completely snow covered.

A course contour chart was built by noting topo data every quarter mile. Having DeLorme Topo USA was worth its weight in gold for this. The course could finally be certified, six months after getting started. The course was certified at 42.195km on one certificate and the 5k splits were put on a second certificate to keep the paperwork cleaner. This was by far the most time consuming measurement I had ever done.

In July Race director Jim Barnett contacted me because the Finish needed to be changed. The finish line had been a real pickle to measure and lay out inside the ballpark because they didn't want runners damaging the field while trying to keep from too many or too sharp a turn. Now the finish was on the other side of the field along the first base line. (Actually a better finishing path than the original.) The change didn't take too long since one of my measurement points was just outside the park and after the 26 mile split. With a new Finish detail map the course was again certified. No change was made to the certified splits certificate since none of them were affected.

On September 15th I found myself at the Airdock because the Start line needed to be moved outside the Airdock. This time all that was needed was a steel tape to measure from a reference point to the new start line. Another new detail drawing and the Marathon was again certified. This time a new certificate was necessary for the certified splits.

On October 11, 2003 the race went off. The course was followed as measured and a train between mile 10 & 11 stopped the leading Marathon Team runners. Fortunately only the elite National team runners got held up (3 minutes) and the course was clear for the remainder of the field. As I understand it the race is looking to change the course for next year to remove some of the hillier portions and possibly add a 10k race.

A MEASURER'S TALE

What's your confidence level when you measure a course? You did your best and the final measurement was a "reasonable accurate distance. Or was there some doubt? And what did the race director think about it? Consider a recent situation.

The race director has done all the necessary spade work on a three-loop (not the same loop) course. It was tricky and involved. The multi-loop course had been laid out, measured by a police vehicle (taking the tangents!) and approved by the local municipal authorities. (No names, no location, no distance are mentioned to protect every body.)

So, when the measurer (experienced) came up with a distance that was about 200 meters longer than expected, alarms went off — loud enough for two more car checks plus another ride by the first measurer and a call for a second opinion. That measurer, also experienced, rode for a distance that confirmed the original. The race director and course director were finally convinced so all ended well.

We all know a car odometer is good for an approximate layout, nothing more. The basic problem here was the fear the original measurement was not performed as laid out by the race director, that, somehow, the measurer had missed a block or a turn-around or in some way lengthened the course, resulting in multiple measurements — a lot of time, money and effort.

Certifier makes sure road races are right length

Measuring marathons

By Stephanie Storm
Beacon Journal staff writer

It may not seem like a dangerous job, but being a race course certifier carries its own set of risks.
There's unpredictable weather to deal with, and heavy traffic during peak business hours.
And then there's dealing with both variables at the same time, as Mike Wickiser had to do in January while completing the official certification of the 26.2-mile Road Runner Akron Marathon course.
The inaugural race begins at 8 a.m. Saturday.
Wickiser, a 53-year-old Silver Lake resident, dubbed the experience of finishing the certification of Akron's marathon a ``war story'' after riding his specially calibrated bicycle through the snow. He even had to walk alongside it on the last leg of the course, sometimes with winter traffic coming head-on.
``It was a unique assignment from the start in that those running the marathon already had a rigid starting and ending point,'' Wickiser said, referring to the Lockheed Martin Airdock and Canal Park stadium, respectively. ``By the time I was done, it was one for the books.''
It didn't help that after having completed the assignment in December 2002, Akron race officials made a course change that meant the path would have to be certified a second time to make sure it still met guidelines.
``It was a coincidence Mike lived here, and we were fortunate to have him so near,'' said Jim Barnett, the marathon's executive race director.
`It's a big job, even by bicycle. And then we decided to make a slight change a couple months ago that we felt made the spectator view better, and we had to bring Mike back out to recertify the course.''
And then there's the complicated mathematical formula that certifiers such as Wickiser use. Although Wickiser considers the formula ``simple, but precise,'' it sounds anything but.
``You measure a known distance of 300 meters by steel tape end to end four times,'' Wickiser began. ``Then you take an average of four calibration rides and divide the number of elapsed counts by distance. Then you add 1.001 to that value to get a working constant.''
Once he arrived at that point, Wickiser went out and measured the course twice (well, actually four times), to make sure the distances agreed within eight-tenths (0.08) percent.
`Then it's back to the calibration course, ride four more times and take a look at the temperature differences,'' he said.
Whew! Not exactly simple stuff for those of us who stopped taking math courses after algebra got complicated.
And get this: Wickiser does all this course certification work as a hobby. His real job is with the city of Cuyahoga Falls.
Yet he figures he has certified 130 courses, including working on the team that measured the Olympic marathon routes in Atlanta in 1996 and Sydney, Australia, in 2000.

Mike Wickiser, of Silver Lake, has put over two thousand miles of race course measurement on his bike and recently measured the course for the Akron Marathon, which will be run Saturday

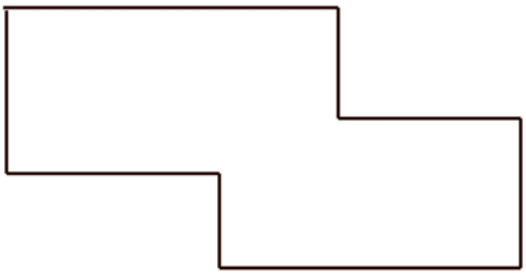
``Everyone thinks it sounds like so much fun, but because it's a business trip, there's not really a whole lot of time to go sightseeing,'' Wickiser said. ``It's simply a passion I feel strongly about.''
So much so that Wickiser also serves as chairman of U.S.A. Track and Field's Road Running Technical Council. ``I handle a lot of paperwork, with copies of course certification since 1979,'' he boasted.
And, of course, being a math guy, Wickiser can't help but break it all down. ``That's four full, four-drawer file cabinets in my basement that house 23,198 actual certificates.''
OK. Well, the thing is, unless the Road Runner Akron Marathon course is changed again, it won't need to be recertified for 10 years.
``Don't worry, I'll find some 5Ks and other races around Ohio to work on,'' Wickiser said.
And no doubt he'll do just that. Unless, of course, Akron's officials find another reason to make a slight change.
More than 2,400 runners have entered either the full 26.2-mile Road Runner Akron Marathon or as a member of a relay team. Entry deadline is Friday. For information, call 877-375-2786 or visit www.akronmarathon.org. Training questions can be answered at www.ohio.com.

Akron Beacon-Journal, October 9, 2003

SPR vs "MEASURE WHERE THE RUNNERS WILL RUN"

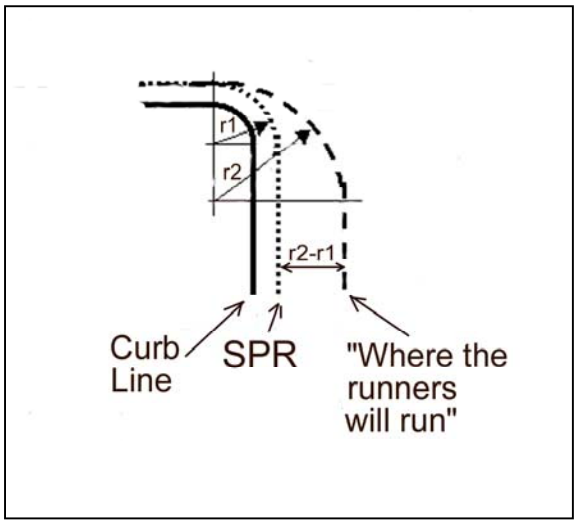
I recently had a chance to ride with a measurer on a course that had eight 90 degree turns. He was riding ahead, and I followed. I noticed that as he rode, he approached each turn between 1 and 2 metres farther out than I rode, then turned smoothly so that when he emerged from his turn, on the next straight leg of the course, he was the required 30 cm from the curb.

I rode the Shortest Possible Route (SPR), as best I could, hitting the beginning of each turn 30 cm out, slowing down, and maintaining the 30 cm throughout the turn.



Here is the outline of the course

At the conclusion of the ride, the measurer asked me what I thought of his riding. I replied that it looked not too bad, but that he seemed to be taking the beginning of each turn a bit wide. He replied that he was attempting to replicate the path that a runner would take.



At the end of the ride we calculated our lengths. I had 8732.2 metres and he had 8740.6 metres. Difference = 8.4 metres.

What accounted for the difference?

Here's a picture of a typical turn.

A little algebraic manipulation leads to the relationship:

$P2 - P1 = (\pi/2 - 1)(r2 - r1)$ or,

$P2 - P1 = 0.57\ (r2 - r1)$

Where:

P2 – P1 = the difference between the measurements on a single corner
r2 – r1 = the distance from the SPR to the approaching path taken by the non-SPR measurer.

For an 8.4 metre difference over the whole 8-turn course, each turn would have a difference of 1.05 metres. This corresponds to an offset of 1.8 metres. This corresponded well with my observation of the measurer's riding.

With calculations completed we discussed the difference. I explained that the SPR is the universally-accepted procedure, and that "measure where the runners will run" was an attractive concept, but that different riders will have different opinions as to where this path lies, and there is no easily-applied uniform definition of this path. This makes it difficult to get good agreement between measurements.

……Pete Riegel

From MNFORUM

A DUCT TAPE STORY

We have an event here in Kansas City, a 5 km and a 10 km, both run totally underground in a limestone cavern/mine. The mining operations continually expand the amount of available space. We last measured the courses in 1998. For 2004, the owners notified us that as a result of ongoing mining operations, we could redesign the courses such that we would have longer straights and fewer turns. So we went out there a few nights ago to measure. (Nights are better, as during the day there is significant truck traffic; they left the lights on for us during the night.) The route is all paved.

The first thing was to lay out a calibration course. We had laid one out in 1998 and certified it. One end was clearly located, but the other end was sort of in the middle of nowhere and not clearly located. We found the first end immediately, the nail and washer. But, we searched in vain for the other end. So, we decided to lay another out from scratch.

Starting at the known end we measured out 100 ft lengths. In doing this, we noted that at the locations of several of the lengths we found evidence of duct tape. Not the full piece, but numerous strands of the tape fibers.

Then, at 1000' we also found duct tape evidence. Looking more carefully, we found the nail (the washer was no longer there).

We felt this survival of the tape was quite amazing. However, we also note that there is not rain or snow in the limestone cave. They do periodically power sweep and wash the pavement, to clear off the mining dust.
Nevertheless, this incredible longevity of the tape is felt to be unlikely in the real world.

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BERLIN

Further to today's new world marathon record set by Paul Tergat at 2:04:55 in Berlin.

I was in Berlin last weekend to check-measure the course originally measured by Siegfried Menzel. We calibrated at 06.00 on the Sunday morning, 21 Sept, and two hours later were still waiting for the police escort to show up.
They did so at 08.15, giving enough warning so that I could calibrate again (it was a cold morning, but warming up) just before we set off. The calibration course is 607.7m in length and lies between the start and finish lines (which are about 800m apart).

On re-calibation I found that there had been a change of 10 counts per calibration run. I used the average of the constants to calculate distance and found (with x 1.001) the course as measured by me to be 42,204.3m, compared to 42,192.2m from the start reference (2.8m into the course) and the finish reference (coincident with the actual finish line).

There were two places where I had to measure wide because of parked vehicles: at 10.1km and at 39.8km. The first probably added about 1.7m and the second about 3.5m to the shortest possible route. Additionally, at around 13km there were road works obstructing the shortest possible route at a left had turn. It was suggested that these would still be in place at the time of the race, so I measured around them without concern. However, in analysing my measured 5km sections, I was 9.1m "too long" between 10-15km. the 1.7m referred to above may be deducted, but this further excess seemed to suggest that Siegfried's original measurement had been without the road works in place.

On race day today, the works had been completed, and the runners took the shortest possible route. After the race I revisited this location to check that the SPR did not "shave" my measured route by more than (9.1m-1.7m) = 7.4m. To my relief, the difference was 6m.

My check measurement should therefore have been corrected from 12.1m more than the original measurement to 6.1m more, and 5.2m of this could be accounted for by the enforced departure from the SPR in the two locations previously mentioned.

In the race itself Tergat had a phalanx of "pacemakers" throughout. The leader's kilometre splits (and Tergat was never more than 10m behind the leader) were as follows (7km split was missed):

1km - 2:59; 2km - 6:06; 3km - 9:10; 4km - 12:03; 5km - 15:00; 6km - 17:56; 8km - 23:53; 9km - 26:53; 10km - 29:55; 11km - 32:53; 12km - 35:49; 13km - 38:44; 14km - 41:44; 15km - 44:45; 16km 47:43; 17km - 50:42; 18km - 53:39; 19km - 56:36; 20km - 59:43; 21km - 1:02:43; Halfway - 1:03:01; 22km - 1:05:45; 23km -1:08:47; 24km - 1:11:48; 25km - 1:14:42; 26km - 1:17:41; 27km - 1:20:38; 28km - 1:23:34; 29km - 1:26:27; 30km - 1:29:24; 31km - 1:32:17; 32km - 1:35:11; 33km - 1:38:06; 34km - 1:41:03; 35km - 1:43:59; 36km - 1:46:54; 37km - 1:49:46; 38km - 1:52:39; 39km - 1:55:31; 40km - 1:58:36; 41km - 2:01:27; FINISH 2:04:55

Tergat got away from his last pacer, Sammy Korir, just past 41km, but only got a lead of about 10m. It stayed that way until the last 100m, when Korir closed slightly, as Tergat cast a few glances back over his shoulder in his final strides.

Andres Espinosa (Mexico) finished 4th in a new M40 record of 2:08:46, his first half having been 1:04:28

Hugh Jones
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GREAT NORTH RUN

The drop in this case is little or no advantage. The trend for all but the initial 1.25M to the bridge and a short steep down at 11.8M point is uphill - slowly but surely.

The 1m per 1km protocol may be a blunt instument in assessing fairness of a course.

Which weighs more 1.3 downhill or almost 12 miles tending uphill?

There was no question of an assisting wind on the day this year though there was not the traditional battle into the wind for the final 1.3M this year.

Faster run than Lisboa “record” which really is something on such a course.

Anything possible in Portugal, particularly if one or more rivals push Paula for more than a couple of miles.

Chris Paul
idea@mcr1.poptel.org.uk
a minute a mile slower than PR!

1M/KM

Chris Paul says, in a recent post, commenting on the Great North Run’s configuration:

<<<The 1m per 1km protocol may be a blunt instument in assessing fairness of a course.

Which weighs more 1.3 downhill or almost 12 miles tending uphill?>>>

As one of those people who worked in the early days to formulate the limit of 1 m/km, I concur with Chris. Moreover, I believe most of those who worked on USATF Rule 185.5 would also agree.

If one agrees that standards are needed to exclude those few courses that are aided (only about 10 percent in the US are aided - non-US information is not available), then the problem becomes to write a standard.

Does anyone have a better standard in mind? I shrink from the thought that courses should be evaluated by panels of “experts” rather than by a simple, easy-to-understand rule. Is it perfect? Certainly not. What in this world is perfect? Is it better than anything else thus far thought of? I think so, but am ready to stand corrected.

Pete Riegel
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GNR COURSE

The Great North Run course has a separation of about 12 13km, or 61%. I checked 1:25,000 maps and estimated the drop as from 50m at the start to 25m at the finish, but the official race literature gives the drop as 30.5m.

There are a lot of ups and downs in between, and the course is not an easy one, unless (like in Boston, for example) there is a following wind. The course goes south for 2km, then tacks east to the coast for about 16km (direct distance more like 14km), before a sharp left turn to go NW up the coast for the last 2km.

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RADCLIFFE 5KM RECORD

I was in the lead vehicle to see Paula Radcliffe run 14:51 in Hyde Park this morning. Her split times were: 2:58, 5:58, 8:56, 11:53, 14:51 The course has a drop of 4m and a separation of 410m. There was no dope testing.

I laid down the finish line first and then looked around the course to see how the barriers had been placed. I had to reposition them in several locations, but one of the few places where I did not was at 1900m, where a better running turn added 2.4m to the distance as measured previously (11.6 instead of 9.2m). I therefore laid down the start line 2.4m further forward from the position originally intended. The front face of the start gantry was about 1m behind the start line itself, which was a convenient arrangement.

There were five other places along the course where the route as measured diverged from the route as set up and defined by barrier placement. In all cases these added to the distance run, but in no single case would it have added more than a metre.

This is an almost identical course (the variation being in the barrier placement on the day) to that on which Sonia O’Sullivan ran 14:56 last year (Sonia placed third in today’s race, behind Derartu Tulu).

Pete Riegel, Mike Sandford and Dave Cundy previously validated a similar course on which Paula Radcliffe ran 14:57 in 2001. There was no drop at all to that course, but the new course includes both ups and downs, and is not a particularly “fast” one.

Hugh Jones
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GPS MEASUREMENTS

I am a recent subscriber to MNF and a surveyor with an interest in course measurement. I have a query if I may direct it to you.

I am very interested in the potential of GPS for course measurement and I am well aware of the technical issues of GPS surveying. Has MNF and/or the newsletter carried any

more items about the use of GPS? Do you know of anybody in particular that has/is conducting research into this? Have you any comments about its potential/disadvantages for course measurement?

Thanking you in advance,
Stuart Gordon
gordonsj@vesta.curtin.edu.au

GPS COURSE MEASUREMENT

Thanks for the append to Measurement News Forum. I am the inventor of the Jones Counter which is used on virtually all course measurements in the world. I, like you, am interested in the possibility of using GPS for course measurement. The little bit of research I have done has convinced me that absolute GPS is not accurate enough. However, Differential GPS MIGHT be able to do the job. However, it is quite a bit more complicated. I am hoping that, as time goes on, DGPS will be simplified so it can be used.

Alan Jones
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GPS MEASUREMENTS

I've been using consumer-grade GPS for just over a year when measuring with a Jones/Oerth or JOL Counter. I've found it particularly useful in relocating split locations where landmarks are non-existant (ie. country roads). I was over in Bernie Conway's neck of the woods this summer. I placed a quarter on the side of the road a few blocks from his house, set a GPS waypoint, handed the GPS over to him and asked him to find the 25 cent piece. Bernie is now 25 cents richer for his efforts! It's not a reliable measuring tool, though. Tree canopy or tall buildings have a negative impact on accuracy. To make matters worse, the GPS unit that I've been using, a Garmin eTrex Vista mounted on my handlebar using Garmin's bicyle mount, turns off when the bike hits a bump. Thinking that this could be a defective unit, I tried riding with an eTrex Legend. The same thing happens; I suspect that the batteries jiggle and lose contact. This has only happened on the bike; I have yet to contact Garmin.

Laurent Lacroix
llacroix@mb.sympatico.ca

PROFESSIONAL SURVEYING OF COURSES

Has anybody used or employed surveyors to perform a course measurement and is able to pass on the company details of the surveyor? I suspect that surveyors are rarely used and only for very big events due to the expense and time.

I ask because I want to speak to a surveyor who has done such a job, I have a number of questions regarding methodology and overall accuracy.

Regards,
Stuart
gordonsj@vesta.curtin.edu.au

About 11 years ago a professional surveyor measured the Huron House Boy's Home in Bright's Grove, Ontario. They sent the data to Pete Riegel and he certified the course ON-1993-011-PR. The procedure was very time consuming compared to using a bike and a Jone's Counter. I also had a class taking a surveying course at a Community College in Waterloo attempt to measure a race, however the course finished before all the measuring was completed.

Bernie Conway
Chief Certifier for Canada
measurer@ican.net

We have a few land surveyors who got involved in measurement and initially we have found that they struggle with the concept that the Jones counter can be more accurate (or perhaps a more appropriate process) than their land survey techniques. Being a land surveyor does not make them the 'best' or better measurers and indeed I have one partner in a surveying company who is actually a liability as a measurer. (not just my opinion, but also from a top IAAF official) - The point I would try to emphasise is that we have adopted a standard process which works well and while it may not be precision accuracy of measuring a straight line - it is a consistent method of measurement.

One of the greatest discussion areas is the use of EDM to set out a calibration distance as opposed to use of a tape, and even here there is a logical sense in this. When a surveyor set this out they will often simply set up an EDM at one end and then set out to the other end to find a set distance say 500m. While precautions need to be taken to get a true straight line with a tape - taping in short segments does take allowance of undulations in the road which an EDM does not account for as it measures in a straight-line through the air.

I am not saying - don't use a surveyor, but I am saying that they tend to need to have a) and understanding as a runner and b) to understand the process of measurement (limitations and benefits) that has been adopted. see no logical reason for any other method being adopted by surveyors as this would cease to make courses 'comparable'

I am interested to hear other people experience of using surveyors - (BTW I make these comments as a professional civil structural engineer who has obviously been trained in land surveying techniques so it is not about running the professions down)

regards
Norrie Williamson
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USATF/RRTC CERTIFIED COURSE LIST
New Entries, September - October 2003

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	m/km DROP	Pct SEP	MEASURER	REPLACES
10 mi	AL 03001 PH	A	Auburn	Tough Ten Run	0.5	2	D Underwood	
Cal	AL 03038 BDC	A	Birmingham	Willow Lane 300 meter	0.0	100	B Conway	
Cal	AL 03039 BDC	A	Birmingham	6th Ave. N. 300 meter	0.0	100	D Rogers	
5 km	AR 03006 DLP	A	Fort Smith	Mercy Celebrity Classic 5k (2003)	0.0	0	J Curry	AR 96001 DLP
42.2 km	AR 03007 DLP	A	Fayetteville	Hogeye Marathon	0.0	0	C Knott	
Cal	AR 03008 DLP	A	Fayetteville	Van Asche dr. 1000 ft. Calibration	1.0	100	C Knott	
5 km	AR 03009 DLP	A	Fayetteville	Habitat for Humanity 5k	1.4	8	C Knott	
5 km	AR 03010 DLP	D	Texarkana	Texarkana Race for the Cure	0.0	3	B Bryant	
5 km	AR 03011 DLP	A	Texarkana	Texarkana Race for the Cure	0.0	3	B Bryant	AR 03010 DLP
5 km	CA 03009 TK	A	San Francisco	Race For the Cure	0.0	6	T Knight	
5 km	CA 03010 TK	A	Martinez	Shell/MEF Run for Education	0.0	3	T Knight	
21.1 km	CA 03011 TK	A	San Francisco	US Half Marathon	0.1	1	T Knight	
5 km	CA 03038 RS	A	Davis	Fleet Feet Labor Day 5k	0.0	1	D Thurston	
21.1 km	CA 03039 RS	A	Coronado	Silver Strand Half Marathon	-0.1	63	G Rahill	CA 00048 RS
10 km	CA 03040 RS	A	Los Angeles	Arden Energy Run 10k	0.0	1	R Scardera	
5 km	CA 03041 RS	A	Los Angeles	Arden Energy Run 5k	0.0	2	R Scardera	
42.2 km	CA 03042 RS	A	Sacramento	2003 Sacramento Marathon	0.0	0	D Scott	CA 97056 RS
21.1 km	CA 03043 RS	A	Sacramento	2003 Sacramento Half Marathon	0.0	0	D Scott	CA 97057 RS
4 mi	CO 03015 DP	A	Highlands Ranch	Miles for Miracles	0.3	6	J Stout	
Cal	CO 03016 DP	A	Durango	4th Ave. 1000 ft.	0.0	100	E Young	
5 km	CO 03017 DP	A	Evergreen	Cougar Stride	31.4	62	D Poppers	
5 km	CO 03018 DP	A	Denver	Mile High City	2.0	12	A Mabry	
21.1 km	CO 03019 DP	A	Denver	Mile High City	0.5	3	A Mabry	
42.2 km	CO 03020 DP	A	Denver	Mile High City	0.2	1	A Mabry	CO 01022 DP
42.2 km	CO 03021 DP	A	Fort Collins	Easy Street Marathon	0.0	2	M Moore	CO 02027 DP
5 km	CO 03022 DP	A	Highlands Ranch	Run for Lauren	0.0	1	D Poppers	
4 mi	CT 03008 DR	A	Branford	Branford Shores Fall Classic	0.0	1	B Stephenson	
5 km	DC 03030 RT	A	Washington	Press Club 5k	0.0	1	R Thurston	
10 mi	DC 03031 RT	A	Washington	Army Ten Mile	0.2	4	R Thurston	
10 km	GA 03009 WC	A	Augusta	WJBF News Channel 6 Turkey Tro	0.0	0	T Crute	
Cal	IA 03010 KU	A	Davenport	New Beiderberke dr. 1082.375 ft.	0.0	100	K Ungurean	
Cal	IA 03010 MF	A	Des Moines	Ohio Street 500 meters	0.0	100	B Lorenz	
21.1 km	IA 03011 MF	A	Des Moines	2003 Des Moines Half Marathon	0.3	2	B Lorenz	IA 02006 MF
42.2 km	IA 03012 MF	D	Des Moines	2003 Des Moines Marathon	0.1	1	B Lorenz	IA 02005 MF
42.2 km	IA 03013 MF	A	Sioux City	Weekender Lewis&Clark Marathon	-0.1	4	S Uhl	IA 03009 MF
42.2 km	IA 03015 MF	A	Des Molines	2003 Des Molines Marathon	0.1	1	B Lorenz	IA 03012 MF
Cal	IL 03002 KU	A	Rock Island	18th Ave 304.8 meter calibration	0.0	100	K Ungurean	
10 km	IL 03008 KU	A	Rock Island	Nancy M. Kapheim Memorial 10k	0.3	4	K Ungurean	
5 km	IL 03009 KU	A	Rock Island	Nancy M. Kapheim Memorial 5k	-0.6	8	K Ungurean	
42.2 km	IL 03011 KU	A	Moline	Quad Cities Marathon	0.0	0	K Ungurean	IL 02005 KU
21.1 km	IL 03012 KU	A	Rock Island	Quad Cities Half Marathon	0.0	0	K Ungurean	IL 02006 KU
5 km	IL 03076 JW	A	Chicago	La Villata 4k Run	0.0	12	C Hinde	IL 03056 JW
10 km	IL 03077 JW	A	Lake Zurich	Alpine Runs 10k	0.0	1	J Wight	IL 02079 JW
5 km	IL 03078 JW	A	Lake Zurich	Alpine Runs 5k	0.0	1	J Wight	IL 02080 JW
8 km	IL 03079 JW	A	Joliet	Explore Joliet	0.0	1	C Hinde	
42.2 km	IL 03080 JW	A	Chicago	LaSalle Bank Chicago Marathon	0.0	2	J Wight	IL 02088 JW
5 km	IL 03082 JW	A	Chicago	Chicago Distance Classic 5k	0.0	0	J Knoedel	
20 km	IL 03083 JW	A	Chicago	Chicago Distance Classic 20k	0.0	0	J Knoedel	
5 km	IL 03085 JW	A	Chicago	Can You Stand the Heat 5k	0.0	0	C Hinde	
5 km	IL 03086 JW	A	Cicero	Celebrate Fitness 5k	0.0	21	C Hinde	
5 km	IL 03087 JW	A	Chicago	ASI I Care 5k	-0.3	7	C Hinde	
5 km	IL 03088 JW	A	Chicago	Race To Stop Global Warming 5k	0.0	0	J Wight	
8 km	IL 03089 JW	A	Chicago	Race To Stop Global Warming 8k	0.0	0	J Wight	
15 km	IL 03090 JW	A	Chicago	Race To Stop Global Warming 15k	0.0	0	J Wight	
21.1 km	IL 03091 JW	A	St. Charles	Fox River Half Marathon	0.0	0	J Knoedel	
5 km	IL 03092 JW	A	Kankakee	Winterfest 5k	0.0	4	C Hinde	

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	m/km DROP	Pct SEP	MEASURER	REPLACES
5 km	IL 03093 JW	A	South Barrington	Strides for Stillman	-0.6	12	C Hinde	IL 03051 JW
21.1 km	IL 03094 JW	A	Chicago	Chicago Half Marathon	0.0	2	J Knoedel	IL 02078 JW
5 km	IL 03095 JW	A	Chicago	Life Without Lupus 5k	0.0	3	C Hinde	
5 km	IL 03096 JW	A	Elmhurst	Breadbasket Classic 5k	0.0	1	C Hinde	IL 00069 JW
5 km	IL 03097 JW	A	Big Rock	Big Rock Plowing Match 5k	0.0	0	C Hinde	
5 km	IL 03098 JW	A	Aurora	S.A.F.E 5k Walk/Run	0.6	4	C Hinde	
10 mi	IL 03099 JW	A	Elk Grove Village	Race For Research	0.0	0	C Hinde	IL 98056 JW
5 km	IL 03100 JW	A	Belvidere	Sprout Sprint	0.0	1	N Yarger	
5 km	IL 03102 JW	A	Channahon	Firefly 5k	0.0	0	C Hinde	
5 km	IL 03103 JW	A	Dixon	Meadows Lark A Run In The Park	5.0	26	D Lindsey	
5 km	IL 03104 JW	A	Chicago	Winnemac Park 5k	0.0	2	C Hinde	
5 km	IL 03105 JW	A	Hinsdale	Rooney Heart 5k	0.0	0	C Hinde	IL 00072 JW
42.2 km	IN 03006 MW	A	French Lick	Germany to France Marathon	0.0	4	J Johnson	
5 km	IN 03007 MW	A	Bloomington	Jill Behrman Run for the End Zone	0.0	3	J Sauer	IN 02012 JG
5 km	KS 03027 BG	A	Shawnee	Hope in Action	0.0	0	L Joline	
5 km	KS 03036 BG	A	Overland Park	Flag Run	0.0	0	J Mulligan	
10 mi	KS 03037 BG	A	Overland Park	Flag Run	0.0	0	J Mulligan	
4 mi	KS 03038 BG	A	Lawrence	Run for Success	0.6	7	S Riley	
5 km	KS 03040 BG	A	Buhler	Mike Williams Memorial	-0.2	1	L Richardson	
5 km	KS 03041 BG	A	Goddard	Goddard 5 km	-0.2	12	L Richardson	
5 km	KS 03043 BG	A	Merriam	Merriam Thriller	0.0	0	L Joline	
10 km	KS 03046 BG	A	Lawrence	Great Pumpkin Pursuit	-0.1	0	S Riley	
Cal	KY 03034 PR	A	Louisville	Greenwood Rd. Park Floodwall	0.0	100	W Kingsbury	
10 km	KY 03035 PR	A	Louisville	Easter Seals 10k	0.0	0	P Mahoney	
10 km	MA 03019 RN	A	Dartmouth	Camp Metacomet 10k Road Race	0.0	4	R Nelson	
5 km	MD 03006 JS	A	Bowie	Rockledge Rampage 5k	0.0	0	P Quinn	
20 mi	MD 03007 JS	A	Cockeysville	Land America Race at the Ridge	0.0	0	W Diegel	
5 km	ME 03004 RF	A	Auburn	YMCA 5k A-L Wellness Weekend	0.6	1	G Roy	
5 km	ME 03005 RF	A	Auburn	L/A Bridge Run	0.0	2	G Roy	ME 00005 WN
5 km	MI 03016 SH	A	Middleville	Thornapple Trail Run	4.4	20	R Dewey	MI 01023 SH
10 km	MI 03017 SH	A	Auburn Hills	Standard Federal	-0.1	1	S Hubbard	MI 02036 SH
5 km	MI 03018 SH	A	Auburn Hills	Standard Federal	-0.2	2	S Hubbard	
42.2 km	MN 03030 RR	A	Walker	North Country	0.0	0	R Recker	MN 83003 TC
5 km	MN 03031 RR	A	St. Paul	State Capitol	0.0	1	D Wright	
5 km	MN 03034 RR	A	St. Paul	Milk Run	0.0	3	R Recker	
5 km	MN 03035 RR	A	St. Paul	Lilydale	0.0	5	R Recker	
8 km	MN 03036 RR	A	St. Paul	Sheppard	0.0	0	R Recker	
5 km	MN 03036 RR	A	St. Paul	Sheppard	0.0	0	R Recker	
5 km	MN 03037 RR	A	St. Paul	Grand	0.0	0	R Recker	
5 km	MN 03038 RR	A	Detroit Lake	Detroit Lake	0.0	6	R Recker	
Cal	MO 03028 BG	A	Kansas City	Airworld 1000 ft.	0.0	100	L Joline	
Cal	MO 03029 BG	A	Kansas City	Liberty Memorial 1000 ft.	0.0	100	L Joline	
5 km	MO 03030 BG	A	Kansas City	Arrowhead	-1.8	2	L Joline	
10 km	MO 03031 BG	A	Kansas City	Arrowhead	-0.9	1	L Joline	
5 km	MO 03032 BG	A	St. Joseph	Moonlight Run	0.0	1	L Joline	
42.2 km	MO 03033 BG	A	St. Charles	Lewis & Clark	0.0	0	D Spetnagel	MO 02025 BG
21.1 km	MO 03034 BG	A	St. Charles	Lewis & Clark	0.0	0	D Spetnagel	MO 02025 BG
5 km	MO 03035 BG	A	Kansas City	Race For the Cure	0.0	6	K Raymer	
5 km	MO 03042 BG	A	Kansas City	Run for a Child	0.0	0	L Joline	
8 km	NC 03001 BS	A	Hendersonville	Apple Festival 8km Road Race	-0.4	1	D White	
10 km	NC 03029 PH	A	Wilmington	Tri Span Race	0.0	4	F Guy	
5 km	NC 03033 PH	A	Spruce Pine	Mineral City 5k	0.7	5	M Studholme	
5 km	NC 03034 PH	A	Wendell	Harvest Festival 5k	0.6	20	P Hronjak	NC 01017 PH
5 km	NC 03035 PH	A	Durham	Fitness World Fall 5k	1.8	8	D Forbis	
5 km	NC 03036 PH	A	Raleigh	Feet for the Fight	-0.1	1	P Hronjak	NC 02038 PH
5 km	NC 03037 PH	A	Raleigh	Memory Run	0.1	3	P Hronjak	
5 km	NC 03038 PH	A	Gastonia	Labor Day 5k	0.0	1	L Davis	
5 km	NC 03039 PH	A	Gates County	Gates County Swamp Fest 5k	0.0	2	P Hronjak	
Cal	NC 03040 PH	A	Wilmington	Navaho Trail 1000 ft. Calibration	0.0	100	F Guy	
5 km	NC 03041 PH	A	Durham	Country Fair 5k	0.0	1	D Forbis	

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	m/km DROP	Pct SEP	MEASURER	REPLACES
42.2 km	NE 03013 KU	A	Omaha	2003 Omaha Marathon	-0.5	2	G Meyer	
21.1 km	NE 03014 KU	A	Omaha	2003 Omaha Half Marathon	-1.0	3	G Meyer	
10 km	NE 03015 KU	A	Omaha	2003 Omaha 10k	2.1	8	G Meyer	
5 mi	NH 03008 RF	A	Warner	Warned Fall Foliage Festival 5 mile	0.0	0	R Fitzpatrick	
5 km	NH 03009 RF	A	Nottingham	Children's Miracle Network 5k	0.0	6	K Traynor	
10 km	NJ 03001 WB	A	Camden	Ben Franklin Bridge Challenge	0.3	0	B Belleville	NJ 98001 WB
5 km	NJ 03019 LMB	A	East Amwell	East Amwell 5k Harvest Run	0.0	0	L Baldasari	
21.1 km	NJ 03020 LMB	A	Hamilton	Hamilton Half Marathon	0.4	2	L Baldasari	
5 km	NJ 03021 LMB	A	Gloucester City	Heroes to Heroe 5k Run	0.6	81	L Baldasari	
5 km	NJ 03022 LMB	A	Cranbury	Cranbury 5k	0.6	6	P Hess	
5 km	NJ 03023 LMB	A	Edison	Lightning 5k 2003	0.0	0	P Hess	
5 km	NJ 03025 LMB	A	New Egypt	New Egypt Fall Festival 5k	0.0	4	L Baldasari	
5 km	NV 03005 BC	A	Reno	Northern NV Race for the Cure	0.0	0	D Thurston	NV 02006 BC
5 km	NV 03006 BC	A	Las Vegas	LVTC - Sunset 5k Course	0.0	4	T Kelly	
Cal	NV 03007 BC	A	Reno	Trademark Dr. 1000 ft. calibration	0.0	100	D Thurston	
5 km	NV 03008 BC	A	Las Vegas	Mountain Crest 5k	0.0	2	B Callanan	
10 km	NV 03009 BC	A	Las Vegas	Mountain Crest 10k	0.0	0	B Callanan	
5 km	NV 03011 BC	A	Reno	Run Reno 5k	0.0	0	D Thurston	
42.2 km	NY 03036 PR	A	Potsdam	Potsdam Marathon	0.0	1	M Tessier	
Cal	NY 03037 PR	A	Potsdam	Pine St. Arena 1000.01 ft.	0.0	100	M Tessier	
8 km	NY 03038 AM	A	Walden	Walden 8k	1.1	5	B Cavanagh	
5 km	NY 03039 AM	A	Callicoon	Delaware Youth Center 5k	0.0	0	B Cavanagh	
5 km	NY 03040 AM	A	Ballston Spa	Jailhouse Rock 5k	2.4	10	J Gilmer	
8 km	NY 03041 AM	A	Montgomery	Montgomery 8k	0.0	1	P Hess	
10 km	NY 03042 AM	A	Jamesport	Sound to Bay Fireman's 10k	0.0	64	G Westerfield	
10 km	NY 03043 AM	A	Ancram	The Simon's General Store 10k	0.5	5	W Graustein	
5 km	NY 03044 AM	A	Shortsville	Twin Cities Lighthouse 5	1.2	9	G Tillson	
42.2 km	OH 03009 MW	A	Akron	Akron Road Runner Marathon	0.7	16	M Wickiser	OH 03007 MW
5 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	3.2	58	M Wickiser	OH 03002 MW
25 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	3.6	53	M Wickiser	OH 03002 MW
30 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	0.9	51	M Wickiser	OH 03002 MW
20 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	3.7	46	M Wickiser	OH 03002 MW
15 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	-0.3	37	M Wickiser	OH 03002 MW
10 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	-0.7	35	M Wickiser	OH 03002 MW
35 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	0.2	34	M Wickiser	OH 03002 MW
40 km	OH 03010 MW	A	Akron	Akron Marathon Certified split	0.6	21	M Wickiser	OH 03002 MW
5 km	OH 03011 MW	A	Cleveland	Cleveland Race for the Cure	1.3	6	M Wickiser	OH 02011 MW
5 km	OH 03038 PR	A	Lancaster	Lancaster Pacesetter 5k	0.0	1	J Glaze	
5 km	OH 03039 PR	A	Cincinnati	Redlegs Run for Home	-0.1	4	K Weissmann	
100 mi	OH 03040 PR	A	Sylvania	TRRC 100 Mile Championship	0.0	0	D Standish	OH 00040 PR
50 km	OH 03041 PR	A	Sylvania	Olander Park 50 km	0.0	1	D Standish	
50 mi	OH 03042 PR	A	Sylvania	Olander Park 50 Mile	0.0	1	D Standish	
100 km	OH 03043 PR	A	Sylvania	Olander Park 100 km	0.0	0	D Standish	
2 mi	OH 03045 PR	A	Canton	Kempthorn Charity Chase 2 Mile	0.0	1	J Wilhelm	
5 mi	OH 03046 PR	A	Canton	Kempthorn Charity Chase 5 Mile	0.0	0	J Wilhelm	
5 km	OK 03017 BB	A	Stillwater	In Like A Lion	-0.8	4	J Smith	
5 km	OK 03018 BB	A	Oklahoma City	First Half of Redbud Classic	-1.6	40	J Smith	
42.2 km	OK 03019 BB	A	Oklahoma City	OKC Memorial Marathon 2003	0.0	1	G Lafarlette	
5 km	OK 03020 BB	A	Edmond	Greek Stampede - Out and Back	0.0	0	J Smith	
5 km	OK 03021 BB	A	Oklahoma City	Gusher Gallop	0.0	1	J Smith	
5 km	OK 03022 BB	A	Oklahoma City	Kirkland Klassic	0.0	1	D Garrett	
5 km	OK 03023 BB	A	Edmond	Greek Stampede Run - Loop	-0.2	6	J Smith	
8 mi	OK 03024 BB	A	Stroud	Greatest Athlete - Jim Thorpe Run	-0.1	1	G Lafarlette	
5 km	OK 03025 BB	A	Tulsa	Brady District Land Run	0.0	0	G Lafarlette	
5 km	OK 03026 BB	A	Norman	The Ike Hike	0.0	0	J Smith	
5 km	OK 03027 BB	A	Oklahoma City	Run With the Bulls	0.0	1	J Smith	
5 km	OK 03028 BB	A	Tecumseh	Doc Rowntree Run	0.6	9	J Smith	
10 km	OR 03005 LB	A	Bend	Bigfoot Run 10k	14.1	89	R Daniels	
5 km	PA 03023 WB	A	Philadelphia	PDR Classic - 2003	0.0	0	B Belleville	
10 km	PUR 03044 PR	A	San Juan	Carrera Familiar 10k El Nuevo Dia	0.3	4	P Zapata	
5 km	RI 03004 RN	A	Providence	CVS pharmacy Downtown 5k	0.0	0	R Nelson	RI 02007 RN

DISTANCE	COURSE ID	ST	LOCATION	COURSE NAME/RACE	m/km DROP	Pct SEP	MEASURER	REPLACES
5 km	SC 03019 BS	A	Prosperity	Prosperity Lakefest 5k	0.0	1	S Blake	
5 km	SC 03020 BS	A	Columbia	Boys and Girls Club 5k	0.6	2	D White	
Cal	SD 03048 PR	A	Rapid City	W. Main St. (Camp Rapid) 1000 ft.	0.0	100	E Egbert	
42.2 km	SD 03049 PR	A	Rapid City	Mt. Rushmore Int'l Marathon	16.1	54	E Egbert	SD 96035 BB
1 mi	TN 03004 DJR	A	Gray	Toys-for-Tots 1 Miler	3.4	20	D Rogers	
5 km	TN 03005 DJR	A	Gray	Toys-for-Tots 5k	1.1	6	D Rogers	
10 km	TX 03015 JF	A	Austin	IBM Uptown Classic 10k	0.0	2	J Ferguson	TX 02013 JF
42.2 km	TX 03017 JF	A	Marathon	Marathon 2 Marathon	3.0	100	J Ferguson	
10 km	TX 03018 JF	A	Marathon	M2M 10k	0.0	0	J Ferguson	
5 km	TX 03019 JF	A	Austin	Keep Austin Weird 5k	0.0	0	J Ferguson	
10 mi	TX 03020 JF	A	Austin	Pervasive Power Charge 10 Mile	0.0	0	J Ferguson	
21.1 km	TX 03021 JF	A	Austin	3M Half Marathon	6.1	84	J Ferguson	TX 02024 JF
21.1 km	TX 03070 ETM	A	San Antonio	Army Dillo Half Marathon	0.0	0	M Johnson	
42.2 km	TX 03070 ETM	A	San Antonio	Army Dillo Marathon	0.0	0	M Johnson	
4 mi	TX 03071 ETM	D	Grapevine	F4M, Fellowship Church 4 Mile	0.0	1	C Clines	TX 02079 ETM
5 km	TX 03072 ETM	A	Houston	Houston Press/Metro 5k	0.0	3	E McBrayer	
21.1 km	TX 03073 ETM	A	Houston	Halliburton International HMAR	0.0	1	E McBrayer	TX 02110 ETM
5 km	TX 03074 ETM	A	Dallas	South Dallas Stroll	0.0	3	K Ashby	
1 mi	TX 03074 ETM	A	Dallas	South Dallas Stroll	0.0	0	K Ashby	
5 km	TX 03075 ETM	A	Sugar Land	Carol Williams 5k	0.0	5	B Mixon	
5 km	TX 03076 ETM	A	Fort Worth	Protectors of Freedom 5k	0.0	0	C Clines	TX 02076 ETM
20 km	TX 03077 ETM	A	Houston	Koala Centers & Luke's Locker 20k	-0.1	1	E McBrayer	TX 02084 ETM
5 km	TX 03078 ETM	A	Lubbock	LubbockRace for the Cure	0.0	8	B Binning	
5 km	TX 03079 ETM	A	Fort Worth	Jingle Bell Run for Arthritis	0.0	4	C Clines	TX 02103 ETM
4 mi	TX 03080 ETM	A	Grapevine	F4M, Fellowship Church 4 Mile	0.0	1	C Clines	TX 03071 ETM
5 km	TX 03081 ETM	A	Fort Worth	Panther Prowl 5k	0.0	8	M Polansky	
1 km	TX 03082 ETM	A	Dallas	Greek Festival Run	0.0	3	K Ashby	
1 mi	TX 03082 ETM	A	Dallas	Greek Festival Run	0.0	2	K Ashby	
5 km	TX 03082 ETM	A	Dallas	Greek Festival Run	0.0	1	K Ashby	
15 km	TX 03083 ETM	A	Dallas	Autumn Equinox 2003 15k	0.0	0	K Ashby	TX 01042 ETM
25 km	TX 03085 ETM	A	Houston	KRTS Classical 25k	0.0	0	E McBrayer	TX 93064 ETM
1 mi	TX 03090 ETM	A	Dallas	Victory Over Cancer Run	-1.9	6	K Ashby	
5 km	TX 03090 ETM	A	Dallas	Victory Over Cancer Run	0.0	1	K Ashby	
5 km	TX 03091 ETM	A	Dallas	Helping Hands 5k Run	0.0	0	K Ashby	
Cal	TX 03092 ETM	A	Amarillo	Route 66 Historical 800 meter	0.0	100	D Lard	
5 km	TX 03093 ETM	A	Irving	Pumpkin Dash 5k	-0.4	12	M Polansky	
5 km	UT 03004 DP	A	Salt Lake City	Sugarhouse	1.6	6	L Smithee	
5 km	VT 03003 RF	A	Essex Junction	IBM 5k	0.0	0	S Eustis	
21.1 km	WA 03006 BL	A	Richland	Indian Summer Half Marathon	0.0	0	A Dausman	
5 km	WA 03007 BL	A	Richland	Indian Summer 5k	0.0	0	A Dausman	
5 km	WI 03081 JW	A	Milwaukee	Grape Stomp	0.0	0	K Gilgenbach	WI 98006 WG
5 km	WI 03084 JW	A	Milwaukee	Hank Aaron State Trail 5k	1.2	6	K Gilgenbach	
5 km	WI 03106 JW	A	Shorewood	Run/Walk for Fitness	0.0	2	D Weyer	
10 km	WI 03107 JW	A	Beaver Dam	Run for Knowledge 10k	0.0	1	T Aten	

Renewed

5 km	KS 92008 BG	A03	Rose Hill	Rose Hill 5k	0.0	0	L Richardson	
2 mi	KS 92024 BG	A03	Conway Springs	Conway Springs	-0.1	8	L Richardson	
10 km	KS 92025 BG	A03	Conway Springs	Conway Springs	0.0	3	L Richardson	
Cal	VA 92020 RT	A03	Virginia Beach	Mount Trashmore 1/2 mile	0.0	100	M Robinson	
5 km	VA 93007 RT	A03	Appalachia	Railroad Days 5k	0.0	0	B Chaney	
Cal	ME 91001 GN	A	Norridge	Norridgewock Calibration 2640 ft.	0.0	100	V Pinney	

Copies of these certificates available from:
Mike Wickiser - Course Registrar
2939 Vincent Road
Silver Lake, OH 44224-2916
Phone 330-929-1605
FAX 509-351-5383
Mikewickiser@neo.rr.com

Each certificate includes a course map.

A complete listing of USATF Certified courses is available at:
www.rrtc.net

PHOTOS FROM THE ARCHIVES

Pete Riegel (L) and John Disley (R) take a photo break between teaching sessions at the IAAF measurement seminar held in Jakarta, Indonesia in March 1989

John Disley (foot on tape) giving calibration course measurement guidance to students

PUBLICATIONS AVAILABLE FROM RRTC

Printed Course Lists - A list of certified courses for any state is $2.00. (Free to RRTC certifiers). You will receive a list that is current as of the last published Measurement News. Courses can be sorted in a special way; otherwise it will be sorted by distance as it appears in MN. Other specially-sorted lists can be done - for instance, you might want to have all the 5k's in IL, IN, and MO. If you are online, lists can be sent that way. Contact Mike Wickiser at MikeWickiser@neo.rr.com

Web Page Access to Course Lists:The complete list can be downloaded from the RRTC website at **www.rrtc.net/download/** Also, try the new USATF Search Engine linked from **www.rrtc.net** or directly at **www.usatf.org/events/courses/search/**

Individual Certificates - These may be obtained by sending the course number and $2.00 per course desired. **SEND THE COMPLETE ID, INCLUDING PREFIX AND SUFFIX LETTERS**, i.e: CA 92057 RS. Send course name, length and location as well. If you are thinking of hiring a measurer, this is an excellent way to see the sort of work you can expect. In addition, you may wish to check out a course you intend to run. Bring the map to the course and see if the race director got it right!

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

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

Electronic Certificate Templates (available to Certifiers only), in Adobe Acrobat forma. Requires Acrobat or Acrobat Reader 4.0 or greater (Current Acrobat Reader may be downloaded for free from **www.adobe.com**). The template allows you to fill in certificates on the computer and print them. Available in both FS and non-FS version. Distributed by Bob Baumel by email or diskette [same addresses as for Measurement software]. Bob can customize the template with certifier's personal info at the bottom to avoid re-typing it every time (Be sure to specify exact ID text desired when requesting a template).

Online course measurement book, edited by Bob Baumel. It's a revision of the one you can buy from USATF, but the basic procedures have not changed. Available at: **www.rrtc.net**

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

Course Measurement Video - a concise 17 minute introduction to course measurement, intended as a supplement to Course Measurement Procedures. See how it's done! Version 2 sells for $10 but there are still a few copies of the original version available for $7.50. Send to: Tom McBrayer - 4021 Montrose - Houston, TX 77006-4956.

Historical/Technical Material Available on CD

Measurement News Archive - Every issue of Measurement News from #1 (1982) to #115 (2002). Full of material describing measurement techniques, technical articles, and history, written by numerous people worldwide. Set of 2 CD's in pdf (Adobe Acrobat 5.0) format. Cost $10.00, postpaid.

Historical Archive - A collection of technical articles, measurement reports, seminars spanning the period 1963 to present. Includes detailed full reports of several group rides of Olympic Marathon courses. All on one CD in pdf format. Cost $5.00, postpaid.

The above two items are available from:
Pete Riegel, 3354 Kirkham Road, Columbus, OH 43221
email: riegelpete@aol.com

OTHER PUBLICATIONS AND EQUIPMENT

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

Jones/Oerth Counters - Paul Oerth - 2455 Union St - Apt 412 - San Francisco, CA 94123. Phone: 415-346-4165 Fax 415 346 0621. Email: Poerth@aol.com. US Price is $70 for the 5 digit model, $80 for the 6 digit model, postpaid. Foreign price is $75/$85 plus postage. Foreign orders shipped by airmail. Visa, MasterCard, American Express cards accepted. Advance payment is required.

RunScore - The flagship of IBM-style finish line programs. For information contact: Alan Jones - 3717 Wildwood Dr - Endwell, NY 13760. Online at: **www.runscore.com**

Apple Raceberry JaM - Race management software for Macintosh and Windows. Online at **www.raceberryjam.com** or call Jack Moran at (952) 920-0558.

TOPOGRAPHIC MAPS

USA topographic maps are available from:

U. S. Geological Survey 303-202-4200
USGS Map Sales
PO Box 25286, Bldg 810
Denver Federal Center
Denver, CO 80225
Delivery will be made in approx. 4 weeks. Ask for latest price.
Maps can be located and ordered online at: **www.usgs.gov**
Maps can be obtained in just a few days from:
Map Express – PO Box 280445 – Lakewood, CO 80228-0445
1-800-MAP-00EX (1-800-627-0039)
Maps can be located and ordered online at: **www.mapexp.com**

Topo Maps on CD-ROM - 3-D TopoQuads includes authentic USGS 7.5-minute quadrangle maps, assembled into one seamless database
See an interactive online demo at **www.delorme.com**
Also - check out Street Atlas USA from the above – it's a seamless street map of the whole USA at a decent price.

USGS TOPOGRAPHIC MAPS ONLINE - FREE
Maps.Com has a section where you can click on to all USGS maps, free. This can be very handy for obtaining accurate elevation information.
Check out: **www.maps.com**

ROAD RUNNING TECHNICAL COUNCIL

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