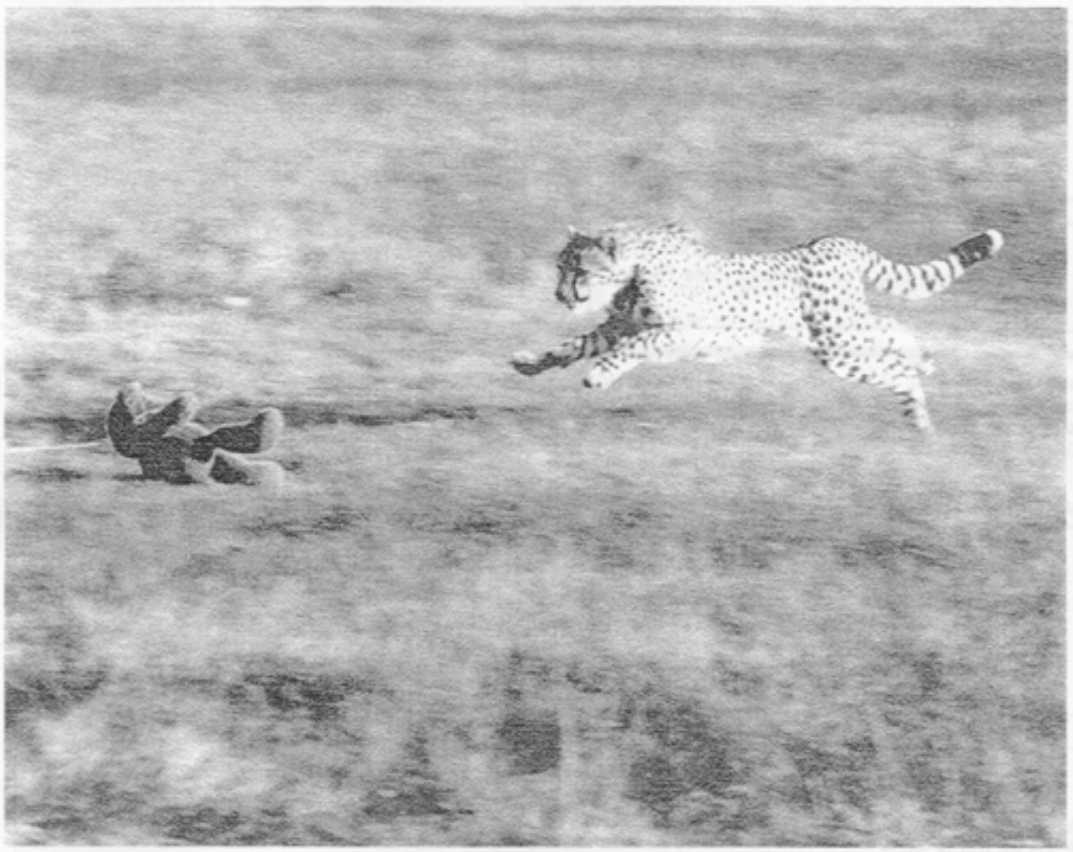
Measurement News

July 2000 Issue #102



Moya is a cheetah, born in South Africa, raised in captivity, and presently resident at the Cincinnati Zoo. He recently set a record for the 100 meters in Kentucky, recording a 6.60, a new record. Here he is shown in pursuit of his teddy bear, in a practice run in which he ran 6:32. The course on which he set the record was USATF certified. See story inside.

MEASUREMENT NEWS
#102 - July 2000

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Chairmans Clatter from Mike Wickiser

Certifiers Warning
Shortly after MN came out in May, I received an empty envelope in the mail. It was from Tom McBrayer and it had contained several certificates for the course list. Tom was able to go back and replace the missing certificates by working backwards from the current listing. I believe the list is accurate but please take a look at the list in this issue and check it over just to be sure.

Drop, Rise, etc.
The issue of negative drop has been the hot topic lately in MNForum. For those who don't get MNF and anyone still willing to listen to this topic, course drop is listed on the certificate for the record keepers and necessary. Negative drop doesn't sound right but the drop section on the certificate needs to indicate a negative value whenever a course rises from start to finish. This information is used by the RRIC to adjust when they compare performances over different course lengths.

Several name changes have been proposed including 'rise' for courses that rise from start to finish. Rise makes sense except that a course with 1 m/km rise would look identical to one with 1m/km drop unless the negative value were kept, and negative rise really sounds wacky. Arising from this discussion, it became clear that drop alone does not give a clear idea of a courses nature. Several courses share a common start and finish but the Hi and Low points vary widely. Others indicate the typical flat, fast contour with little difference in elevations. In an attempt to make some improvement to the course list, all the elevations listed on certificates are now being transcribed onto the 'current' file. The added information makes the list pretty wide. It also requires the conversion of elevations in feet to meters for consistency. Bob Baumel didn't even have to argue for that one! Printing the list in a readable manner with this added information becomes a challenge. Try landscape rather than portrait page set up. It helps keep the print readable. We will continue listing all elevations till the next update as a pilot test. Check it out at **http://members.aol.com:/mikewicksr** and please be vocal in your opinions.

Is this a better way to go?

Is adding this info any good?

Most importantly, should it remain?

NEW LOUISIANA CERTIFIER

Tom McBrayer, Western Vice-Chair, announced that **John Ferguson** will assume the position of Louisiana Certifier. Welcome, John.

KENTUCKY SPEEDWAY CHEETAH DASH

In late May I (Pete Riegel) received an inquiry from Carl Hilker, who wanted to get a course certified and was making preliminary inquiries. His application was a little unusual. He and his wife are involved in an effort to prevent the extinction of wild cheetahs, and the newly-constructed Kentucky Speedway was looking for a stunt to include in their opening ceremonies. Thus was born the "Kentucky Speedway Cheetah Dash." As the course to be certified was only 100 meters, Carl steel-taped it twice, adding the extra 10 cm short course prevention factor, and the course was duly certified as KY 00020 PR. This is the shortest length we have ever certified.

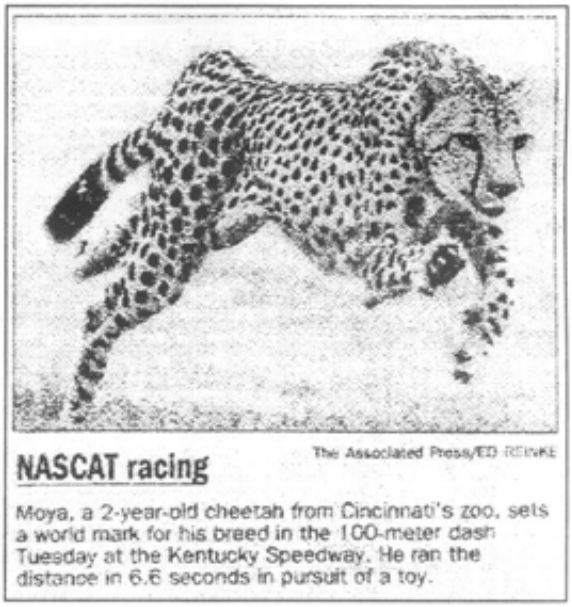
On June 14 a full-dress preliminary trial was held, in front of the invited media. Carl's description of the event follows:

"Weeks (months) of preparation and training paid off, yesterday, June 13th, 2000, when "Moya", a 33 month-old male Cheetah, born in Capetown, South Africa, broke the World Speed Record for the 100 meter Dash for all terrestrial (land) animals and humans, in general, and for Cheetahs, in particular. The event was held at the new Kentucky Speedway in Sparta, Ky. as part of the inaugural festivities celebrating the birth of world-class NASCAR automobile racing in the tri-state area.

The name of this race was the "Kentucky Speedway Cheetah Dash". The course was certified by the Road Running Technical Council of USA Track and Field for accuracy, and, since this event was set up as per "Olympic-class human standards", the technical aspects were identical. As Moya rocketed past his cage door, a "wand" triggered a radio-telemetric signal that started the electronic timer which terminated when his body broke a light beam at the finish line. Stopwatches were used only as a back-up system and verification.

The "motivation factor" for Moya's running speed is governed by his intense desire to capture and hug his favorite Teddy Bear, which skims along the ground being retrieved by an electric motor and take-up reel which results in an 80 mph teddy bear, if neccessary! A Cheetah can use bursts of speed in the 60-plus mph area, and during these runs, a Kentucky State Highway Patrolman was trying to capture these peak speeds with radar and laser, but these efforts were inconclusive. (Perhaps he didn't have enough iron in his blood!) The one thing that we do know is that they can accelerate from zero to 35-plus mph in less than one second!

The existing record was set in Capetown, February 25th, 1999 as a preliminary event to a "human 10K" , by Moya's brother, Nyana Spier. His time was 6.80 seconds.



NASCAT racing

The Associated Press/ED REINKE

Moya, a 2-year-old cheetah from Cincinnati's zoo, sets a world mark for his breed in the 100-meter dash Tuesday at the Kentucky Speedway. He ran the distance in 6.6 seconds in pursuit of a toy.

The Cincinnati Inquirer, Wednesday, June 14, 2000

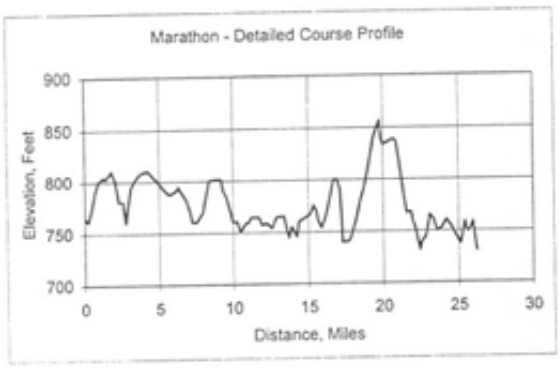
Moya bettered that mark on his first run by 0.11 seconds. His second run, with no appreciable rest in between, was 7.02 seconds. After a thirty minute rest, which included a sponge bath and water stop with lots of TLC by his handlers, he further-reduced the World Mark by another 0.09 seconds with a 6.60 time (with a 10-15 mph headwind!)

The message that Moya is sending out to the world is that Cheetahs in the Wild are in a desperate race to out-run extinction, which is imminent, and only humans can save them."

----- Carl F. Hilker, Jr. Race Director -----

Editor's note: At the time of this writing it is planned to repeat the trial at the opening ceremonies of the Speedway. However, Carl is not sure how Moya will respond when surrounded by a large crowd of noisy people. It may be difficult to keep him focused on the task at hand under these conditions. No matter, the record has been set.

Carl also reports that Moya has run a 6.32 in practice, so there remains room for improvement.



Plotted points = 116
Total Climb = 453 feet
Total Descent = 487 feet

Plotted points = 28
Total Climb = 211 feet
Total Descent = 282 feet

	COLUMBUS	BOSTON	BERLIN	LONDON	ST GEORGE	ATLANTA	CHARLOTTE
Total climb, feet	409.0	577.4	223.4	23.0	330.0	1205.7	950.0
Drop, feet	15.0	446.2	1.6	101.7	2560.0	0.0	10.0
Plotted points	128.0	210.0	165.0	107.0	101.0	338.0	263.0

TOTAL CLIMB CALCULATED FROM DETAILED COURSE PROFILES
Note: These profiles are historical, not current.

	COLUMBUS	BOSTON	BERLIN	LONDON	ST GEORGE	ATLANTA	CHARLOTTE
Start, feet	745.0	462.6	114.8	131.2	5240.0	960.0	760.0
High, feet	850.0	462.6	178.1	164.0	5240.0	1069.9	760.0
Low, feet	730.0	13.1	107.9	3.3	2680.0	790.0	580.0
Finish, feet	760.0	16.4	113.2	29.5	2680.0	960.0	740.0
							0.0
Total Climb, feet	135.0	3.3	68.6	59.1	0.0	279.9	160.0

TOTAL CLIMB CALCULATED FROM START-HIGH-LOW-FINISH

	COLUMBUS	BOSTON	BERLIN	LONDON	ST GEORGE	ATLANTA	CHARLOTTE
Start, feet	745.0	462.6	114.8	131.2	5240.0	960.0	760.0
Low, feet	730.0	13.1	107.9	3.3	2680.0	790.0	580.0
High, feet	850.0	462.6	178.1	164.0	5240.0	1069.9	760.0
Finish, feet	760.0	16.4	113.2	29.5	2680.0	960.0	740.0
							0.0
Total Climb, feet	120.0	449.5	70.2	160.8	2560.0	279.9	180.0

TOTAL CLIMB CALCULATED FROM START-LOW-HIGH-FINISH

RATING COURSE DIFFICULTY - IS "TOTAL CLIMB" USEFUL?

Recent online discussion has focused on the use of "total climb" (sum of all uphill segments of a course) as a barometer of course difficulty. It could be useful, but unless some standardization as to method comes into play, there will be many possible values for the total climb of a course. Broadly speaking, the more points used, the greater the climb.

Above is an example: Total climb is ultimately based on some sort of course profile. It's either an actual, plotted profile or an abbreviated one, based on the elevations of start, finish, high point and low point of a course. One can do a very raw "profile" using these four points, and a calculation of total climb, but a key piece of information is missing. In what order do high and low come? Is it start-high-low-finish? Is it start-low-high-finish? It makes a difference, and without the knowledge of order, the resulting conclusions can be unclear.

For example, the St George Marathon is known for its steep drop But, from examination of only start, finish, high and low, one can come up with a total climb of either zero or 2560 feet for the course. Similarly, Boston could be seen to have a total climb of only 3 feet unless its nature was known.

The best bellwether of course difficulty remains the course profile.

DROP AND SEPARATION OF US COURSES

Range of Drop, m/km		Number
-70 to	-65	1
-65 to	-60	0
-60 to	-55	0
-55 to	-50	0
-50 to	-45	0
-45 to	-40	0
-40 to	-35	0
-35 to	-30	0
-30 to	-25	0
-25 to	-20	1
-20 to	-15	1
-15 to	-10	0
-10 to	-5	13
-5 to	-4	9
-4 to	-3	21
-3 to	-2	34
-2 to	-1	154
-1 to	-0.01	851
-0.01 to	0.01	6451
0.01 to	1	1341
1 to	2	203
2 to	3	95
3 to	4	64
4 to	5	43
5 to	10	91
10 to	15	31
15 to	20	14
20 to	25	6
25 to	30	3
30 to	35	2
35 to	40	1
40 to	45	0
45 to	50	0
50 to	55	0
55 to	60	0
60 to	65	0
65 to	70	1

Range of Separation, pct		Number
0 to	10	8535
10 to	20	285
20 to	30	65
30 to	40	71
40 to	50	42
50 to	60	48
60 to	70	63
70 to	80	92
80 to	90	81
90 to	100	149

All active courses (as of February 29, 2000)	10159
Cal courses & tracks	716
NRDC format Drop/Sep	9
Drop/sep not listed	5
Courses available for analysis	9429
Drop less than or equal to 1	8876
Separation less than or equal to 30	8883
Standard Courses (Drop <1, Separation <30)	8573
Standard courses as a percent of total courses	90.9

EXTREMELY DOWNHILL COURSES

DISTANC		COURSE ID		LOCATION	COURSE NAME/RACE	DROP	SEP
8.00	km	UT	94006 FH	Alta	Alta Peruvian Lodge 8k	67	94
1.00	mi	PA	95008 RE	Mercer	Mercer Miracle Mile	37.9	100
Cal		CA	97008 KY	Pacific Grove	Lighthouse Ave 308.226 m	32.5	100
42.20	km	CA	95053 PR	Palm Desert	Pines to Palms Marathon	31.6	59
21.10	km	CA	86022 RS	Fontana	Fontana Days	30.7	99.5
1.00	mi	OH	94001 RE	Youngstown	Peace Race Mile	27.8	95
5.00	km	UT	93003 FH	Cedar City	Utah Summer Games 5k	26	80

EXTREMELY UPHILL COURSES

DISTANC		COURSE ID		LOCATION	COURSE NAME/RACE	DROP	SEP
5.00	mi	CO	92015 DP	Golden	Climb the Mountain	-66	37
10.00	km	CO	93006 DP	Canon City	Royal Gorge 10k Challenge	-24	47
5.00	km	TN	98001 RH	Gatlinburg	Smoky Mountain Lights 5k	-15.3	64
4.44	mi	NH	95015 WN	Moultonborough	Castle in the Clouds	-9.8	17
5.00	km	MO	99010 BG	Kansas City	YMCA Plaza Run	-9	4.9
5.00	km	NY	90001 AM	Ithaca	Skunk Cabbage (5k split)	-8.5	77
10.00	km	PA	90038 RE	Monaca	Monaca 10k Classic	-7.3	23

A COMPARISON OF SOME INTERNATIONAL COURSE MEASUREMENT SCHEMES

	Number of Accurate Courses				
Kilometers	Poland	Canada	SEAA	USA	France
5	5	25	146	5151	14
10	49	36	691	2069	647
15	22	2	9	161	158
20	15	1	11	84	84
Half Marathon	30	3	405	436	709
25	2	0	2	34	32
30	1	1	0	38	1
Marathon	15	10	89	544	240
50	0	1	3	34	4
100	2	0	1	19	71
200	0	0	0	2	1
500	0	0	0	1	0
Miles					
1	0	3	20	236	0
2	0	1	1	136	0
5	0	1	180	439	0
10	0	1	299	181	0
15	0	0	13	2	0
20	0	0	36	4	0
25	0	0	0	2	0
30	0	0	1	0	0
35	0	0	0	0	0
40	0	0	1	0	0
45	0	0	0	0	0
50	0	0	0	34	0
100			0	1	0
Other	5	72	310	1239	1453
Total Courses	146	157	2218	10847	3414

Courses by Year of Measurement				
Year	Canada	SEAA	USA	France
1990	3	211	1148	45
1991	12	230	1220	81
1992	4	198	1203	255
1993	16	194	1165	415
1994	4	197	1053	415
1995	18	184	1148	470
1996	16	168	1115	435
1997	17	152	1219	428
1998	16	153	1168	419
1999	43	145	1184	451

	Typical Course Code
Australia	A 4/91
Canada	BC-2000-012-BDC
SEAA	95135
USA	OH 98076 MW
France	01/02787/98

	Web Page
Canada	www.mbnet.mb.ca/~llacroix/crrcma.html
SEAA	www.seaa.org.uk
USA	www.rrtc.net

Notes:

Thanks to Tadeusz Dziekonski (Poland), Laurent Lacroix (Canada), Mike Sandford (SEAA), Karen Wickiser (USA), Jean-Francois Delasalle (France) for supplying the above data. Data was collected and analyzed over a four month period, so some small error may be expected in the data.

SEAA stands for South of England Athletic Association. Great Britain does not yet have a single unified system of course measurement.

USA and Canada separate the courses from all other aspects of road racing. Records of events are kept by others within the federations.

In Poland, Tadeusz Dziekonski appears to be the data keeper for both courses and records.

In France, a database of events is kept, as well as a course list, by Jean-Francois Delasalle.

EMAIL CORRESPONDENCE WITH DAVE CUNDY:

From: Riegelpete@aol.com <Riegelpete@aol.com>
To: cundysm@ozemail.com.au <cundysm@ozemail.com.au>
Cc: m.sandford@lineone.net <m.sandford@lineone.net>; Aimssec@aol.com <Aimssec@aol.com>
Date: Saturday, 13 May 2000 23:15
Subject: Re: Triathlon Proposal

Dear Dave,

I've read your triathlon proposal with interest. It makes a lot of sense. May I use it in the next issue of Measurement News? You may get some decent feedback.

Subj: Re: Triathlon Proposal
Date: 5/15/00 8:29:52 AM Eastern Daylight Time
From: cundysm@ozemail.com.au (Dave Cundy & Fran Seton)
To: Riegelpete@aol.com

Thanks Pete. You can use my proposal to generate discussion. Please simply include a note in your preamble that I wrote it three years ago and that Triathlon Australia (our governing body) adopted these measurement techniques in the 1999-2000 season. To my knowledge it has not been addressed by the International Triathlon Union.

Also advise that I will be measuring the 40km cycle and 10 km run courses to be used at this year's Olympic Games using the Jones counter. The start point for the cycle leg is the bike mounting mark (Swiss Timing will have a timing mat at this point) and the 40km point is at the bike dismount mark (another timing mat). The run leg starts as they exit the transition area and cross another timing mat. The 10km finishes at the finish line. In this way the time split for the cycle leg is for a measured 40km and the time split for the run leg is a measured 10km.

Conveniently Fran is the Results Manager for Triathlon at the Games so she produces the split times!

Proposal for the introduction of a

TRIATHLON COURSE MEASUREMENT SCHEME

Prepared by: Dave Cundy
Cundy Sports Marketing
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AUSTRALIA
Phone/fax: 02 43427611.
Email: cundysm@ozemail.com.au

11 August 1997

Introduction

The acceptance of triathlon as an Olympic sport highlights a need for consistent course measurement, particularly if qualifying times are to be a key to Olympic participation. To date the sport has no rules governing measurement.

Some parallels can be drawn from road running. The IAAF, which has overall control of road running, has approved just one method of measuring road running courses and this is accepted world-wide.

In any road running event over an established distance (eg. 10k, half marathon, marathon), there is huge interest amongst competitors, administrators, sponsors, media, etc. to compare times. Whilst recognising that all road courses are different in terms of terrain and weather conditions, timing comparisons become far more relevant if performances are set on courses where there is a consistency in the measurement procedures.

The popularity of road running in the 1970s and 1980s led to the development of strict measurement procedures around the world, with the IAAF and other road running organisations approving the calibrated bicycle method as the only acceptable mechanism.

Broadly, this method involves calibrating a bicycle on an accurately measured calibration course of between 500 metres and one kilometre using a device known as a Jones counter. Following calibration, the measurer rides the run course taking the shortest possible route. After riding the run course, the measurer re-calibrates the bicycle on the calibration course, then makes any final adjustments necessary because of temperature changes, etc.

In Australia I have been responsible for the uniform adoption of the IAAF rules after submitting in 1990 that Athletics Australia adopt my proposal for an Athletics Australia Course Measurement Scheme. Features of this scheme, which I continue to administer, include:

- the training to international standards of course measurers throughout Australia with the successful ones becoming AA approved course measurers;
- the maintenance of a list of approved course measurers;
- the use of a special AA Certified

Accurate Course logo for courses accurately measured by an AA approved measurer;

- the maintenance of a register of all AA Certified Accurate Courses;
- publicity of the scheme to improve the standard of Australian road races.

In recognition of my work in this area, in 1996 I was appointed to the position of IAAF course measurement area representative for Asia and Oceania, giving me course measurement responsibilities throughout these regions. A long-term objective is to establish similar schemes in each of the countries in Asia and Oceania.

Objective

The objective of this proposal is to recommend the introduction of a course measurement scheme for triathlons, in the first instance for Australia but with a view to the scheme being adopted by the ITU before the 2000 Olympics.

Issues

First, there must be agreement on the measurement techniques to be used for each of the disciplines in triathlon. The run leg is relatively simple; I recommend the adoption of the IAAF measurement rules. I understand that the ICU has no fixed rules on measurement techniques for cycle road races but the road running measurement rules can be used successfully. The swim leg is more complex with my research indicating that no uniform measurement techniques are currently in use. I am researching various options and will make further recommendations shortly.

It is interesting to note the 'record' performances by Grant Robinson and Shelley Taylor-Smith in the 25k swim at the current Pan Pac Championships in Japan. They have improved previous records by over 20 minutes. I will seek details of how this course has been measured but course measurement will always be questioned when such massive improvements are made.

In the history of the marathon, where times have had dramatic improvements in a particular race, re-measurement of the course has proved it to be short.

Second, there must be agreement on what is to be measured. Focusing on the Olympic triathlon distances, I recommend that participants actually cover the advertised distances; that is, swim 1500 metres, cycle 40 kilometres, and run 10 kilometres, all excluding distance covered in the transition area. If this is adopted, the following sectors of the triathlon make up the transition areas:

- water exit to cycle start point (outside the transition area)
- cycle finish (outside transition area) to run start (outside transition area).

This approach seems logical but raises more issues. Extra split timing would need to be done - on exit from the water, at the start of the cycle leg, at the finish of the cycle leg; and at the start of the run; plus, of course, the start and finish. It is my understanding that most triathlons currently provide split times at only two points:

- some non-specified point after exiting the water; and
- some non-specified point after completing the cycle.

It must be accepted that all courses are different, as is the case with marathon courses, but participants, administrators, sponsors, media, etc. will, nevertheless, always be fascinated with time comparisons.

In marathoning, organisers all over the world seek out the perfect marathon course, within certain tolerances. There is no tolerance in respect of the distance; if the course is shorter than the advertised distance, times are void. There are other rules, though, concerning terrain. These rules are still the subject of debate but road courses, particularly in the USA, are not considered legal if they have a net fall of more than one metre per kilometre and a separation (as the crow flies) between the start and finish lines of more than 30 per cent of the race distance. That is, in a 10k race, the start and finish line must not be further than 3k apart as the crow flies. These rules are to outlaw excessively downhill courses and point-to-point courses that may enjoy the assistance of a following wind.

These terrain issues will not impact on triathlons where the start and finish of each leg is at the same point. However, I highlight them to demonstrate the attention given to fast courses.

Given the above rules, competition will develop amongst triathlon organisers to find fast courses. And a key will become fast and efficient transition areas because each course will have an accurately measured 1500m swim, 40k cycle and 10k run. Other factors that will make courses fast are the swim conditions and degree of difficulty of the cycle and run legs.

It will never be possible to eliminate these variances, but this has not proved to be a problem with road running where times are legitimately compared because of the standardisation of measurement.

A third issue concerns the difficulty of laying out accurate courses. To make a course accurate, we must have a flexible start line, flexible finish line or an out-and-back section where the turnaround point can be adjusted. The need for a transition area, and the limits on where these areas can be located, will generally leave little flexibility for the location of start and finish lines (with the exception of the run finish)

This means that courses may need turnaround points. This is not such a problem for the run but is a little more difficult for cycle courses, particularly if the turnaround is in a narrow street.

Of course, the organiser who designs a course that is accurate and manages to eliminate as many sharp turns, etc. as possible will have potentially a fast course. But this is no different to the organiser who designs a course free of steep hills, etc.

Recommendations

I recommend that Triathlon Australia endorse a course measurement scheme with the following features:

- swim, ride and run courses to be accurately measured with the distances to exclude any part of the transition area (with the transition area to start immediately on exit from the water after the swim leg)
- the cycle and run legs to be measured along the shortest possible route using the established calibrated bicycle method
- the swim leg to be measured using one standardised method which will be agreed upon after further examination of the options.

I also recommend that Triathlon Australia test these measurement techniques at the World Cup in Sydney on 26 October 1997, the World Championships in Perth on 16 November 1997, and the 1997-98 St George series.

Following the St George series, I recommend a review of the techniques with a view to making any necessary modifications before submitting adoption of the techniques by the ITU.

Planning & Resourcing A Measurement Assignment

Having recently been involved in much debate concerning the cost of course measurement services, I decided to attempt to used my experience as a Project Planner to evaluate the role we perform.

The attached Gantt Chart is a subjective analysis of the tasks required to measure a marathon course to AIMS standards.

It was originally planned to be a rigorous examination of the sequence of tasks required, giving a clear indication of the critical path though the project, as measurers we have to manage. However, it is not as easy as this, and although the sequence of operations is largely set there is some degree of flexibility.

The programme was prepared using Suretrak 3.0 Project Management software, and what appeared to be a modest planning task proved to be rather onerous. The software uses a minimum time unit of one hour, and many of the activities listed should be completed within minutes. To overcome this problem, and still produce a meaningful programme some of the tasks have been given Start to Start links which in practise is not possible.

Another major problem was that the activities obviously peaked on the day of the measurement, and during the early hours of the day when the traffic is light and a police escort is more likely to be provided. To facilitate this programming, a variable timescale facilitate was used, with a unit of one hour being displayed for the day of the measurement, namely 2nd April in the example illustrated. In addition, a separate calendar was set up to cover this period. Whilst the standard or default calendar showed a standard 12 hours of working time being available from 8am - 8pm, the additional calendar was established to assign to the tasks on the day of the measurement which commenced at 3am and finished at 5pm.

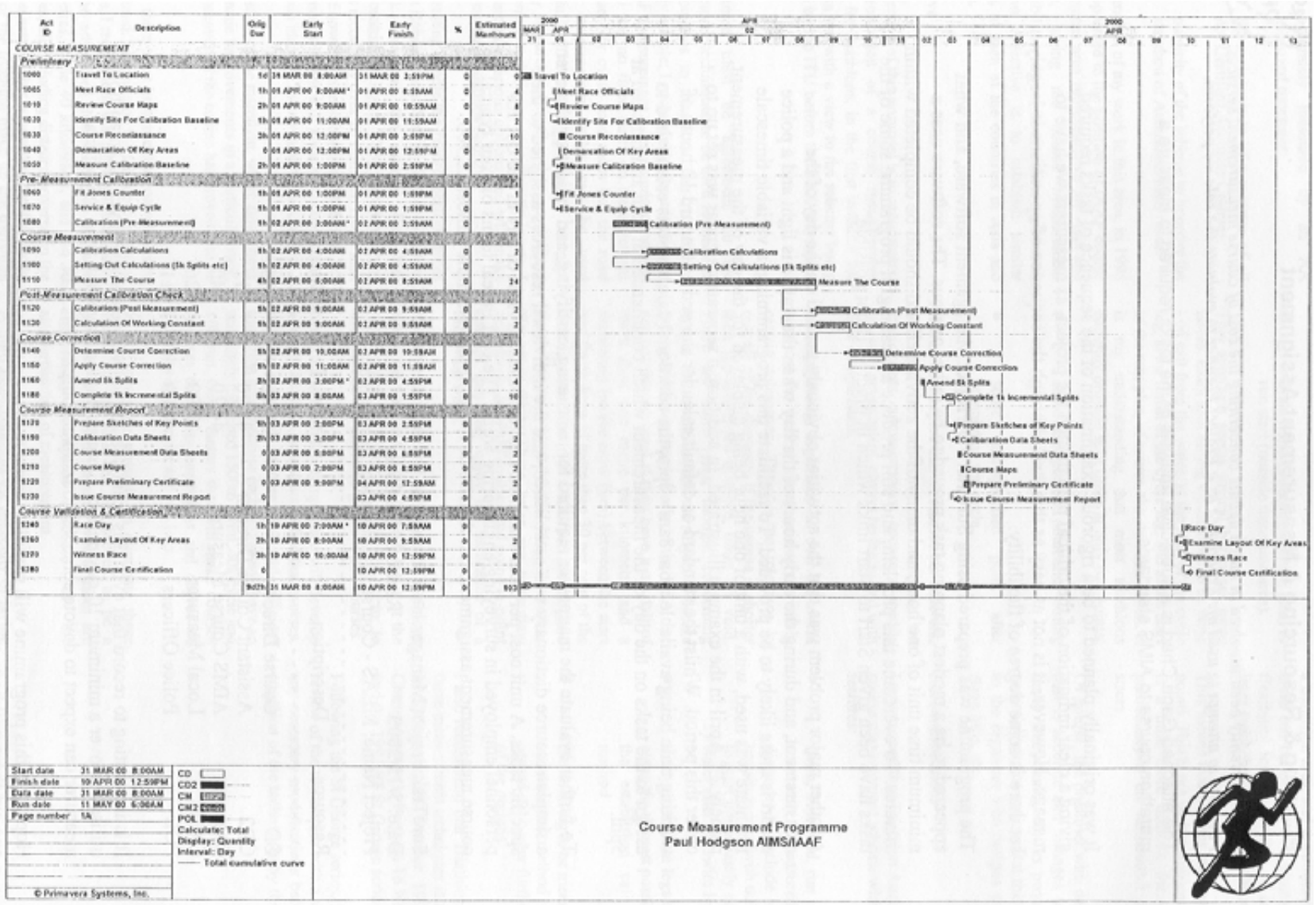
To further evaluate the manpower required for measuring, certifying, and validating the event a simple resource dictionary was established, and the individual resources assigned to their specific tasks. A unit cost per hour was then applied based on rates of pay in the UK for personnel employed in surveying/engineering work. The cost in real terms of your typical course measurement assignment can then be deduced, in this example almost £2,900.

SureTrak Project Manager
Date: 5/15/2000 Resource Dictionary
Project Name: MEAS - Course Measurement Programme Version 1

Resource	Description	Cost (£)	Manhours
CD	Course Director	50.80	15
CD2	Assistant Course Director	44.20	12
CM	AIMS Course Measurer	44.20	40
CM2	Local Measurer	17.00	26
POL	Police Officers	40.00	11

It is interesting to record that even this scant subjective overview shows over 100 man-hours utilisation over a minimum 10-day period. Even excluding travelling time the official measurer can expect to devote some 40 hours to accomplish his task.

Hopefully this programme will stimulate some debate on the subject, and I'm sure that some one out there will have a more analytical approach than I.


Act ID
Description
Orig Dur
Early Start
Early Finish
%
Estimated Manhours
COURSE MEASUREMENT
Preliminary
1000 Travel To Location 1d 31 MAR 00 8:00AM 31 MAR 00 3:59PM 0 0
1005 Meet Race Officials 1h 01 APR 00 8:00AM* 01 APR 00 8:59AM 0 4
1010 Review Course Maps 2h 01 APR 00 9:00AM 01 APR 00 10:59AM 0 8
1020 Identify Site For Calibration Baseline 1h 01 APR 00 11:00AM 01 APR 00 11:59AM 0 2
1030 Course Reconnaissance 2h 01 APR 00 12:00PM 01 APR 00 3:59PM 0 10
1040 Demarcation Of Key Areas 0 01 APR 00 12:00PM 01 APR 00 12:59PM 0 3
1050 Measure Calibration Baseline 2h 01 APR 00 1:00PM 01 APR 00 2:59PM 0 2
Pre- Measurement Calibration
1060 Fit Jones Counter 1h 01 APR 00 1:00PM 01 APR 00 1:59PM 0 1
1070 Service & Equip Cycle 1h 01 APR 00 1:00PM 01 APR 00 1:59PM 0 1
1080 Calibration (Pre-Measurement) 1h 02 APR 00 3:00AM* 02 APR 00 3:59AM 0 2
Course Measurement
1090 Calibration Calculations 1h 02 APR 00 4:00AM 02 APR 00 4:59AM 0 2
1100 Setting Out Calculations (5k Splits etc) 1h 02 APR 00 4:00AM 02 APR 00 4:59AM 0 2
1110 Measure The Course 4h 02 APR 00 5:00AM 02 APR 00 8:59AM 0 24
Post-Measurement Calibration Check
1120 Calibration (Post Measurement) 1h 02 APR 00 9:00AM 02 APR 00 9:59AM 0 2
1130 Calculation Of Working Constant 1h 02 APR 00 9:00AM 02 APR 00 9:59AM 0 2
Course Correction
1140 Determine Course Correction 1h 02 APR 00 10:00AM 02 APR 00 10:59AM 0 3
1150 Apply Course Correction 1h 02 APR 00 11:00AM 02 APR 00 11:59AM 0 3
1160 Amend 5k Splits 3h 02 APR 00 3:00PM* 02 APR 00 4:59PM 0 4
1180 Complete 1k Incremental Splits 5h 03 APR 00 8:00AM 03 APR 00 1:59PM 0 10
Course Measurement Report
1170 Prepare Sketches of Key Points 1h 03 APR 00 2:00PM 03 APR 00 2:59PM 0 1
1190 Calibration Data Sheets 2h 03 APR 00 3:00PM 03 APR 00 4:59PM 0 2
1200 Course Measurement Data Sheets 0 03 APR 00 5:00PM 03 APR 00 5:59PM 0 2
1210 Course Maps 0 03 APR 00 7:00PM 03 APR 00 8:59PM 0 2
1220 Prepare Preliminary Certificate 0 03 APR 00 9:00PM 04 APR 00 12:59AM 0 2
1230 Issue Course Measurement Report 0 03 APR 00 4:59PM 0 0
Course Validation & Certification
1240 Race Day 1h 10 APR 00 7:00AM* 10 APR 00 7:59AM 0 1
1250 Examine Layout Of Key Areas 2h 10 APR 00 8:00AM 10 APR 00 9:59AM 0 2
1270 Witness Race 3h 10 APR 00 10:00AM 10 APR 00 12:59PM 0 6
1280 Final Course Certification 0 10 APR 00 12:59PM 0 0
9d2h 31 MAR 00 8:00AM 10 APR 00 12:59PM 0 803
2000 APR 02
2000 APR 09
Travel To Location
Meet Race Officials
Review Course Maps
Identify Site For Calibration Baseline
Course Reconnaissance
Demarcation Of Key Areas
Measure Calibration Baseline
Fit Jones Counter
Service & Equip Cycle
Calibration (Pre-Measurement)
Calibration Calculations
Setting Out Calculations (5k Splits etc)
Measure The Course
Calibration (Post Measurement)
Calculation Of Working Constant
Determine Course Correction
Apply Course Correction
Amend 5k Splits
Complete 1k Incremental Splits
Prepare Sketches of Key Points
Calibration Data Sheets
Course Measurement Data Sheets
Course Maps
Prepare Preliminary Certificate
Issue Course Measurement Report
Race Day
Examine Layout Of Key Areas
Witness Race
Final Course Certification
Start date 31 MAR 00 8:00AM
Finish date 10 APR 00 12:59PM
Data date 31 MAR 00 8:00AM
Run date 11 MAY 00 6:06AM
Page number 1A
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CD
CD2
CM
CM2
POL
Calculate: Total
Display: Quantity
Interval: Day
Total cumulative curve
Course Measurement Programme
Paul Hodgson AIMS/IAAF

SureTrak Project Manager
Course Measurement Programme

Act ID	Activity Description	Early Start	Early Finish	Resource Manhours	Budgeted Cost	Cost at Completion
Course Director						
1005	Meet Race Officials	01 APR 00	01 APR 00	1	51	51
1010	Review Course Maps	01 APR 00	01 APR 00	2	102	102
1030	Course Reconiassance	01 APR 00	01 APR 00	3	152	152
1040	Demarcation Of Key Areas	01 APR 00	01 APR 00	1	51	51
1110	Measure The Course	02 APR 00	02 APR 00	4	203	203
1140	Determine Course Correction	02 APR 00	02 APR 00	1	51	51
1150	Apply Course Correction	02 APR 00	02 APR 00	1	51	51
1240	Race Day	05 APR 00	05 APR 00	1	51	51
		01 APR 00	05 APR 00	14	711	711
Assistant Course Director						
1005	Meet Race Officials	01 APR 00	01 APR 00	1	44	44
1010	Review Course Maps	01 APR 00	01 APR 00	2	88	88
1110	Measure The Course	02 APR 00	02 APR 00	4	177	177
1180	Complete 1k Incremental Splits	03 APR 00	03 APR 00	5	221	221
		01 APR 00	03 APR 00	12	530	530
AIMS Course Measurer						
1005	Meet Race Officials	01 APR 00	01 APR 00	1	44	44
1010	Review Course Maps	01 APR 00	01 APR 00	2	88	88
1020	Identify Site For Calibration Baseline	01 APR 00	01 APR 00	1	44	44
1030	Course Reconiassance	01 APR 00	01 APR 00	4	177	177
1040	Demarcation Of Key Areas	01 APR 00	01 APR 00	1	44	44
1050	Measure Calibration Baseline	01 APR 00	01 APR 00	2	88	88
1060	Fit Jones Counter	01 APR 00	01 APR 00	1	44	44
1070	Service & Equip Cycle	01 APR 00	01 APR 00	1	44	44
1080	Calibration (Pre-Measurement)	02 APR 00	02 APR 00	1	44	44
1090	Calibration Calculations	02 APR 00	02 APR 00	1	44	44
1100	Setting Out Calculations (5k Splits etc)	02 APR 00	02 APR 00	1	44	44
1110	Measure The Course	02 APR 00	02 APR 00	4	177	177
1120	Calibration (Post Measurement)	02 APR 00	02 APR 00	1	44	44
1130	Calculation Of Working Constant	02 APR 00	02 APR 00	1	44	44
1140	Determine Course Correction	02 APR 00	02 APR 00	1	44	44
1150	Apply Course Correction	02 APR 00	02 APR 00	1	44	44
1160	Amend 5k Splits	02 APR 00	02 APR 00	2	88	88
1170	Prepare Sketches of Key Points	03 APR 00	03 APR 00	1	44	44
1190	Calibaration Data Sheets	03 APR 00	03 APR 00	2	88	88
1200	Course Measurement Data Sheets	03 APR 00	03 APR 00	2	88	88
1210	Course Maps	03 APR 00	03 APR 00	2	88	88
1220	Prepare Preliminary Certificate	03 APR 00	04 APR 00	2	88	88
1260	Examine Layout Of Key Areas	05 APR 00	05 APR 00	2	88	88
1270	Witness Race	05 APR 00	05 APR 00	3	133	133
		01 APR 00	05 APR 00	40	1,768	1,768
Local Measurer						
1005	Meet Race Officials	01 APR 00	01 APR 00	1	17	17
1010	Review Course Maps	01 APR 00	01 APR 00	2	34	34
1020	Identify Site For Calibration Baseline	01 APR 00	01 APR 00	1	17	17
1030	Course Reconiassance	01 APR 00	01 APR 00	3	51	51
1040	Demarcation Of Key Areas	01 APR 00	01 APR 00	1	17	17
1080	Calibration (Pre-Measurement)	02 APR 00	02 APR 00	1	17	17

△ Early start point
▽ Early finish point
Early bar
▼ Total float point
Total float bar
Progress bar
Critical bar
Summary bar
▲ Progress point
▲ Critical point
Summary point
◇ Start milestone point
◇ Finish milestone point

Data date	31 MAR 00 8:00AM
Start date	31 MAR 00 8:00AM
Finish date	05 APR 00 2:59PM
Must finish date	
Target finish date	

Date	Revision	Checked	Approved

SureTrak Project Manager
Course Measurement Programme

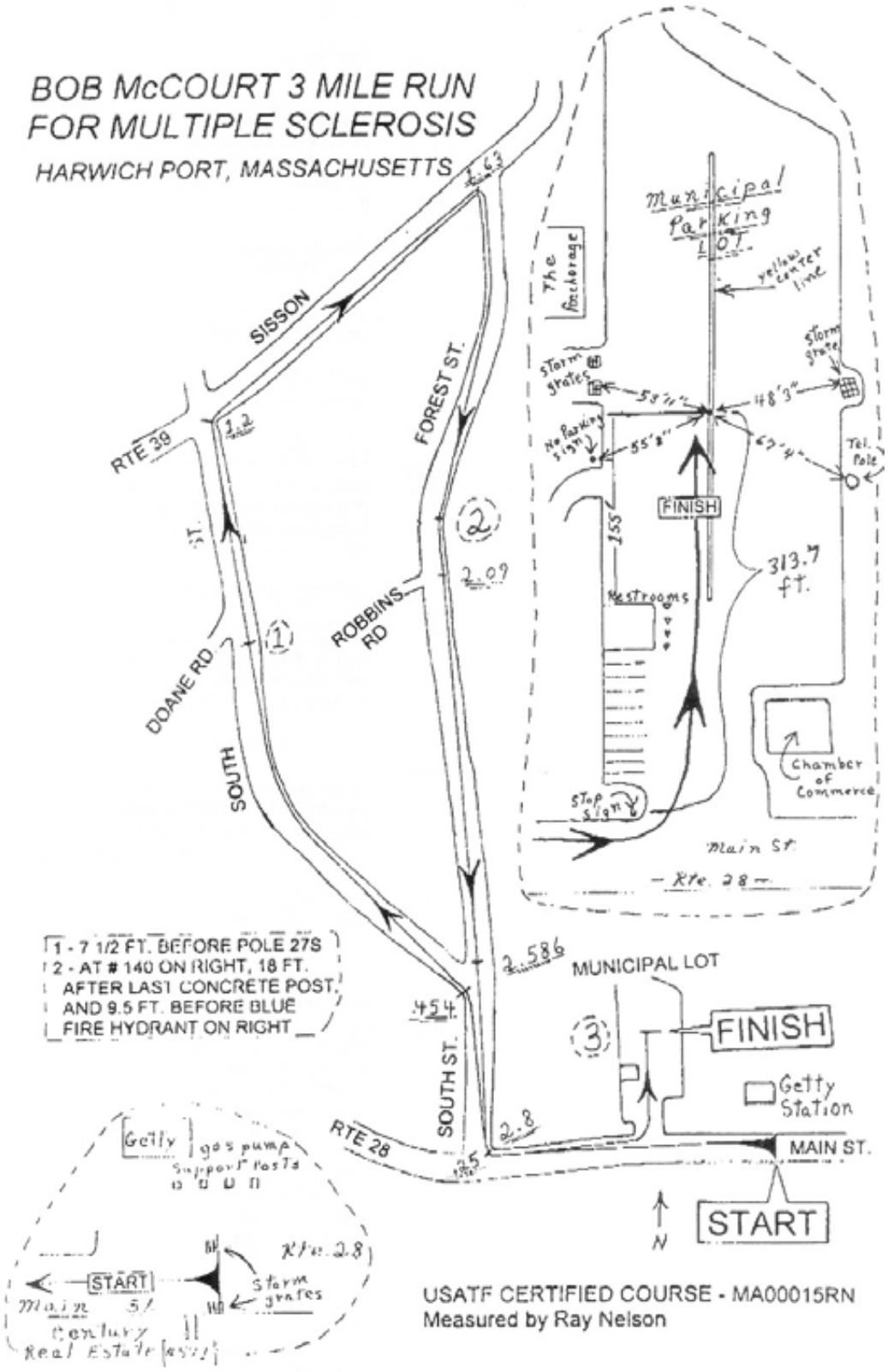
Act ID	Activity Description	Early Start	Early Finish	Resource Manhours	Budgeted Cost	Cost at Completion
1090	Calibration Calculations	02 APR 00	02 APR 00	1	17	17
1100	Setting Out Calculations (5k Splits etc)	02 APR 00	02 APR 00	1	17	17
1110	Measure The Course	02 APR 00	02 APR 00	4	68	68
1120	Calibration (Post Measurement)	02 APR 00	02 APR 00	1	17	17
1130	Calculation Of Working Constant	02 APR 00	02 APR 00	1	17	17
1140	Determine Course Correction	02 APR 00	02 APR 00	1	17	17
1150	Apply Course Correction	02 APR 00	02 APR 00	1	17	17
1160	Amend 5k Splits	02 APR 00	02 APR 00	2	34	34
1180	Complete 1k Incremental Splits	03 APR 00	03 APR 00	5	85	85
		01 APR 00	03 APR 00	26	442	442
Police Officers						
1110	Measure The Course	02 APR 00	02 APR 00	8	320	320
1270	Witness Race	05 APR 00	05 APR 00	3	120	120
		02 APR 00	05 APR 00	11	440	440
1000	Travel To Location	31 MAR 00	31 MAR 00	0	0	0
1230	Issue Course Measurement Report		03 APR 00	0	0	0
1280	Final Course Certification		05 APR 00	0	0	0
		31 MAR 00	05 APR 00	0	0	0

△ Early start point
▽ Early finish point
Early bar
▼ Total float point
Total float bar
Progress bar
Critical bar
Summary bar
▲ Progress point
▲ Critical point
▽ Summary point
○ Start milestone point
◇ Finish milestone point

Data date	31 MAR 00 8:00AM
Start date	31 MAR 00 8:00AM
Finish date	05 APR 00 2:59PM
Must finish date	
Target finish date	

Date	Revision	Checked	Approved

MAP OF THE MONTH



ADJUSTING SPLITS - A STRING FROM MNFORUM

MNF#0618 16June2000

Adjusting Splits

A few weeks ago I measured a 5km course that came out 250 ft. short. The organizers have finally decided to add on distance at the finish by entering the parking lot from a second entrance, and then tack on any remaining shortfall at the start. By my guesstimation they will get maybe 200 ft. at the finish and have to move the start back 50 ft.

My question is how to adjust the intermediate splits, which include all miles & kms. My gut feeling says move them all up 200 ft, but then in the back of my head is the feeling that there should be a proportional increase in the distance they are moved.

Jim Gerweck
zgerweck@aol.com

MNF#0619 16June2000A

Jim, Where did you measure the intermediate splits from, Start or Finish? If the splits are all laid out from the tentative Start, then they should all move the 50 feet the new Start gets moved. If you measured from a tentative Finish then the adjustment would the amount added to the new Finish, about 200 feet.

Best,

Mike
mikewicksr@aol.com

I'll give a shot at answering your query about how to move splits on the 5k found 250' short.
If you measured from start to finish, you'd move the marks back 50'. If you measured from finish to start, you'd move the marks back 200'.
Or another way to get at it; let's say the start is west and finish is east. If you measured from start to finish, you'd move the marks west 50'. If you measured from finish to start, you'd move the marks east 200'. This assumes you're adding 50' to the start and 200' to the finish.
I think...Knowing myself, since it was only 5k, I'd probably just ride over the whole thing and plot new marks. Then I'd tell myself I was right about my guessing all along.

Best, Scott Hubbard
RUNNINGSHORTS@aol.com

It depends on how you set the points. You measured a 5000 m course that is about 4925 meters. The race directors want to add about 60 meters at the finish and about 15 meters at the start. If you measured the course from the finish, then (as an example) the 4km point is 1000 meters from the finish so it's actually 3925 meters from the start. If you add 15 meters to the start, then the 4km point is 3940 meters from the start, so you need to move it 60 meters toward the finish.

On the other hand, if you measured the course from the start, the 4km mark is 4000 meters from the start. When you move the start 15 m back, you need to move the 4km mark 15 meters toward the start.

Since you are adding the distance at the start and finish, the same applies to all intermediate split points, both imperial and metric.

The only time I move splits proportionately is if I have to lengthen a course due to the second ride being significantly shorter than the first (within accepted tolerance, of course).

Jay Wight
jaywight@earthlink.net

Thanks for the suggestions from all. I went to the course this evening and we brought the finish into the parking lot via the second entrance. This added the whole 257 ft. necessary PLUS an additional 83 ft. So we moved the start, but forward, rather than back, as planned.

Since the splits were laid out on a S to F ride, they'll need to be moved forward that same 83 ft. at each point.

I guess I should have figured that out, but it's hot and I've been working late, and my brain is tired.

Jim Gerweck
zgerweck@aol.com

PS - Pulled out a map for another 5km course that was run last night, and I have to admit I did myself proud in terms of splits. Besides the 3 mile points, I had figured all kilometers (which will make Bob Baumel happy), plus 500m, 2.5km (halfway) and 500m to go. So a chronograph-happy racers could punch his watch buttons 10 times (11 if you count the finish).

MNF#0620 17June2000

The answer to Jim's original problem, adding 200 ft at the end and 50 ft at the beginning, is that the adjustments should be proportional. Assuming the original measurement was made start to finish, the adjustments may be figured using the equation:

$$Y = 0.05 X - 50$$

where we have some mixed units. X is the desired split location inmeters and Y is the adjustment from the original location in feet. For example, to find the new 3K point, X is 3000 and Y is calculated as 100 ft, to be added to the old split point.

Bill Glauz
wglauz@kcnet.com

Wait - are these splits ones that you laid down during the measurement which found the course 250ft short? Or did they exist on the course before you measured it up as short?

If they are yours, then they all have to be moved back (towards the adjusted start) by 50ft, except the finish which has the extra 200ft you think can be added in there. It may be that the three mile split is also affected by the finish adjustment, as it is only 172m before the finish line.

I hate feet, yards, etc - and can only just abide miles. To me, a mile isn't 5280 feet or 1760 yards, it's 1609.344m. I list the mile points in a marathon, if the race director requests these, alongside the metric distance rounded up to the next 0.1m - e.g.: 6 miles (9656.1m)

That said, my likely next measurement will be the Flora Light Women's Challenge (organised by the London Marathon) where the 3 mile course is marked off in half-mile splits (that's 804.67m intervals to me). They are going to claim it as an 'inaugural' world best (RRIC have no mark listed for 3 miles). Tegla, Joyce and

Malgorzata Sobanska will run, but the best woman for the task (Sonia O'Sullivan, coached by the race director, Alan Storey) will not be there.

Regards,

Hugh
aimssec@aol.com

Hugh, I agree. I figure all my courses, metric or Imperial, in terms of meters, and indeed, find it hard to think directly in the latter much anymore. That said, I still tend to convert to Imperial when talking to the "common folk."

Jim Gerweck
zgerweck@aol.com

MNF#0621 18June2000

Here's how I do it. First I get the course all measured, and I wind up with values for all intervals from start to finish. For a 5 km course, the intervals may look like this:

	Interval Meters
Start	
1 km	990
2 km	1002
3 km	975
4 km	1010
5 km	1001

Total = 4978 meters. To be added: 22 meters The race director decides that he'd like to add 15 meters to the finish and 7 meters to the start.

This makes the above intervals become:

	Interval Meters
Start	
1 km	997
2 km	1002
3 km	975
4 km	1010
5 km	1016

Now I make a column of actual cumulative meters and desired cumulative meters, and compare them, as below. The needed adjustments jump right out at you:

	Original Interval Meters	Adjusted Interval Meters	Cumulative Meters	Desired Meters	Adjustment Meters
Start			0	0	
1 km	990	997	997	1000	+3
2 km	1002	1002	1999	2000	+1
3 km	975	975	2974	3000	+26
4 km	1010	1010	3984	4000	+16
5 km	1001	1016	5000	5000	0

This may seem like bashing out a lot of numbers, but when I am done I have confidence that I got it right.

Pete Riegel
riegelpete@aol.com

I don't think I'm in agreement with Bill's advice regarding the adjustments on Jim's short course. If one assumes that all of the split points are the proper distance apart except the one on the end that came up short, then they should be adjusted in a way that ensures they are all the same distance from each other. Spreading the adjustment out over all of the splits makes them all different distances when (if they're kilometers) they should all be the same. Please let me know if I have misinterpreted this.

I'll voice my agreement with Hugh on the Imperial/metric issue. It's interesting to work in the real estate (or is that property) and construction (or is that works) industry in the UK, where people still tend to think in terms of feet and inches, but the plans and materials are in metric units. When I first measured the Valley Fox Trot 5K in February, 1995 I purchased a metric engineer's scale (there is no metric architect's scale since the reason you have an architect's scale is that they use fractions of inches to depict feet on drawings, and, of course, such foolishness is unnecessary in the metric system) at the surveyor's store when I bought my 60 meter steel tape. I never used it until I started going to the UK, but since then it has come in quite handy. Now if I can just convince the woman who handles the AutoCad that 1:100 is a legitimate scale...

I encourage my measurers to work in meters- with varying levels of compliance. "4999 meters" tells me much more about a the measurement of a 5K course than "3.10623459 miles".
I do, however, prefer imperial pints over half liters. Especially at pubs.

Jay Wight
jaywight@earthlink.net

The Valley Fox Trot was the first metric course I ran that was marked w/ metric splits (we happened to be in Illinois on vacation). The experience convinced me foreverof the wisdom of this procedure, and I now do it on all metric courses I measure.

Jim Gerweck
zgerweck@aol.com

NF#0622 20June2000

Adjusting splits

Backing up each split 50 ft is so simple that I didn't think that was the problem. I assumed that a systematic error of some sort had caused cumulative measurement error all along the course. For example, a math error could be made in calculating the working constant, which was only discovered after doing the post calibration rides. My solution would then be appropriate instead of repeating the entire measurement.

Bill Glauz
wglauz@kcnet.com

PUZZLE OF THE MONTH

All those jokes about times being taken with the school alarm clock, or the local sundial, seem pretty tame compared to this one.

The Stockholm Olympic Marathon was on a STRICT out-and-back course from the stadium track through Stocksund and Tureberg to the turnaround at Sollentuna. The OR states that "Stocksund [was] about 3 miles (circa 5 kilometres) from the start, and ... Tureberg, 9 miles (15 kilometres) from the Stadium." It also says that the race began at 1:48 pm, and I've collected all the useful split times (pm!) and finish times (elapsed!):

	Stocksund	Tureberg	Sollentuna	Tureberg	Stocksund	Finish
1st	2:17:26	2:42:32	3:01:15	3:22:41	4:02:20	2:36:54.8
2nd	2:17:26	2:42:32	3:00:40*	3:22:40*	4:02:20*	2:37:52
6th	2:18:10	2:44:03		3:26:10		2:43:24.9
13th	2:17:26	2:44:28		3:29:40		2:51:06.6
21st	2:17:39	2:43:10	3:02:30	3:26:24		3:01:39.2

For the record, those are indeed the places they finished, and the asterisks just indicate who was leading, so ignore them too. Also, until the IAAF set the distance at 42.195 km in 1921, a typical Scandinavian marathon was 40.2 km, but again this is no big deal. If necessary redefine them so the course IS 40.2 km, as long as the turn, at Sollentuna, is indeed half way, 20.1 km! Puzzle: How is this mess reconciled? (When did it really start?!)

Malcolm Heyworth

Editor's note:

I have the answer (or at least Malcolm's answer), and my own attempt at reconciling this was pretty feeble. Think, then think again.