



INTERNATIONAL ROAD COURSE MEASUREMENT SEMINAR

---- GRENADA ----

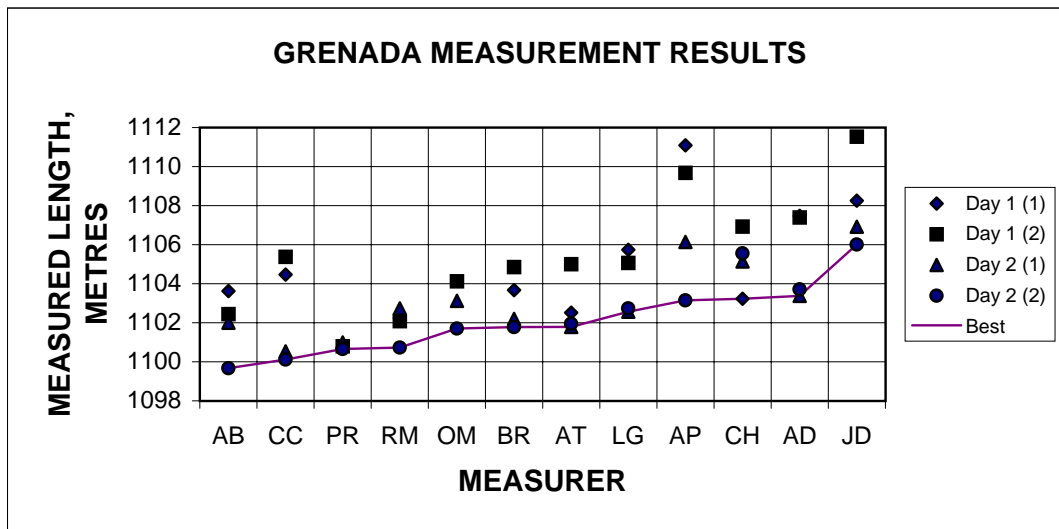
Grenada National Stadium Complex
May 23 & 24, 2003



RESULTS OF ALL MEASUREMENTS OF THE COURSE

Measurement results in metres

		Day 1 (1)	Day 1 (2)	Day 2 (1)	Day 2 (2)	Best
Andre Browne	AB	1103.62	1102.44	1102.00	1099.67	1099.67
Cyril Cox	CC	1104.46	1105.38	1100.53	1100.11	1100.11
Pete Riegel	PR	1100.71	1100.79	1100.99	1100.65	1100.65
Rawlson Morgan	RM	1102.25	1102.08	1102.74	1100.73	1100.73
Orville Maynard	OM	1134.31	1104.12	1103.13	1101.70	1101.70
Benny Rowe	BR	1103.67	1104.85	1102.20	1101.78	1101.78
Angel Tromp	AT	1102.52	1105.00	1101.78	1101.95	1101.78
Leo Garnes	LG	1105.74	1105.07	1102.57	1102.74	1102.57
Abrel J. Patrick	AP	1111.09	1109.68	1106.14	1103.15	1103.15
Cedric J. Harris	CH	1103.23	1106.92	1105.14	1105.56	1103.23
Anthony Davis	AD	1107.48	1107.39	1103.38	1103.71	1103.38
Juan Dake	JD	1108.26	1111.53	1106.91	1106.01	1106.01



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IAAF INTERNATIONAL MEASUREMENT SEMINAR

* * * Grenada * * *

May 23 & 24, 2003

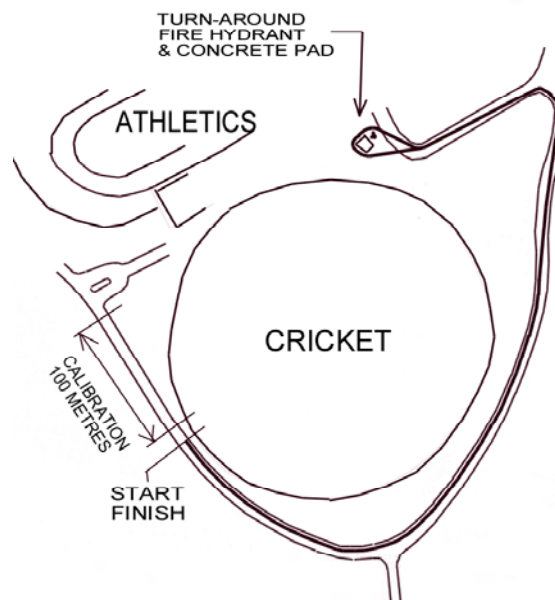
Organization of the Seminar

Early this year I was contacted by Lenford Levy of the IAAF Regional Development Centre, San Juan, Puerto Rico. He asked whether I was free to conduct a measurement seminar in May. I responded with an enthusiastic “yes.” Lenford put me in touch with Conrad Francis, Secretary of the Grenada Athletic Association, who was responsible for the general organization of the seminar. Conrad contacted several Caribbean federations, and 11 participants registered for the seminar. Aruba, Barbados, Dominica, Grenada, St. Kitts and St. Vincent were represented.

The Venue

The seminar was held at the Grenada National Stadium Complex, near St. George’s. Roadways surrounding the athletics and cricket stadiums provided a reasonably secure place for the participants to measure. A nearby gravel-mining operation, and nearby residential neighborhoods, put some traffic on the roads, but it was not heavy.

The course was approximately 1.1 km in length, with a 100 metre straight portion available for the layout of a calibration course. While greater lengths were desirable, the venue represented a safe alternative to more heavily-trafficked areas on the island, and the stadium offered convenient classroom space.



Preliminary Preparation

Before the seminar a general outline of the work and a statement of requirements was sent to Conrad. When I arrived everything was ready. Conrad had arranged for 8 bicycles to be made available for use of the students. He had also purchased a dozen 5-digit Jones/Oerth counters to be distributed to students. I came to Grenada a day early, visited the venue, determined a suitable area for measurement, and prepared a map and data sheet for students to use during the work.

Conduct of the Seminar

Day 1 - Friday, May 23 - Off-island participants assembled at the Grand View Inn, where we were domiciled, and were picked up and taken to the Stadium Complex. Grenada students arrived on their own. I was introduced, made some preliminary remarks, and showed students copies of *Course Measurement Procedures*, the US measurement manual. I explained that we would lay out a calibration course of 100 metres length. I explained that this length was suited to the venue and for instruction, but that 300 metres was the minimum acceptable for real-world measurements.



Taping the calibration course

We left the classroom and went to the road. With the assistance of students, I laid out a calibration course on the stadium side of the road. I deliberately left the length a bit short of 100 metres. When this was done I crossed the road and put down marks that were approximately opposite those previously established. I wanted to have parallel calibration courses so that we would have one-way traffic on each calibration course. I explained that in normal measurement, a single calibration course was generally used.

I then had the students break into two groups, and asked them to measure both courses using steel tapes. The two groups each measured both sides of the road, and each used both tapes during the exercise. The three measurements of each course were averaged, and the necessary correction was added to make each calibration course 100.00 metres in length.

I did not discuss temperature correction, as all participants lived in the tropics, and were quite unlikely to experience problems due to thermal tape contraction. I explained that the temperature correction procedure could be found in the book, and advised them to study it.



Calibrating the bicycles

Once the calibration courses had been marked with a PK survey nail at each end, we returned to the Complex and assembled the Jones/Oerth counters on to the bicycles, and stopped for lunch.



Mounting the counters to the bikes

After lunch we returned to the road, and calibrated the bicycles. I asked the students to follow me, and to observe how I rode on my first measurement of the course. This done, the students were sent off to do their own measuring. Because the test course was not long, students did two measurements of the course, then recalibrated. When all had

completed the riding, we went to the classroom where the measurers did their calculations. I answered questions and generally guided the group through the calculations.

As each measurer completed his work, he was asked to write his result on the bulletin board. As instructor, I had the shortest measurement, and I explained how adherence to the *Shortest Possible Route* was the way to get similar results. I collected all the data sheets for use in preparing this report.

Day 2 – Saturday, May 24 – We again met at the Complex, and I explained that today would be easier, as now we all had experience. I laid two London Marathon t-shirts on the table, and explained that the best ride of the day would have his choice, and second place would have the other. This seemed to provide cheerful motivation. The mood this day was much less nervous than on Friday. The measurers were more sure of themselves, and the measurement results showed a great improvement. The spirit of competitiveness was present, and people appeared to be taking pleasure in the exercise.

With measuring done, we went to the classroom and calculated results. Based on each measurer's calculation, first place winner was Cyril Cox, with Andre Browne second. Subsequent recalculation done in preparation of this report showed that Browne had made a small miscalculation. With correct calculation these two would have exchanged places, with Browne first and Cox second.

All but one showed significant improvement of the first day's measurement, indicating that they had a better understanding of how to follow the *Shortest Possible Route*.

After lunch we enjoyed free-flowing discussions of various measurement topics, followed by a closing ceremony and presentation of certificates attesting that the participants had earned IAAF "C" level measurement status.

Discussion of Results

Results of the measurements are presented in this report. Included are:

- 1) List of measurers
- 2) Measurement of the calibration course
- 3) Measurement results from day 1
- 4) Measurement results from day 2

On return home, I used the data provided by each measurer to correctly calculate the course length, using a computer. Sometimes the computer value does not agree with the length calculated by the measurer. In these cases, either the student or I made a mistake. Each student's data sheet will be included with this report so that they may see their mistake or inform me of mine. Some common mistakes were:

- Loose riding – failure to follow the *Shortest Possible Route*
- Transposing numbers or incorrect reporting
- Rounding off calibration figures prematurely
- Incorrect calculation of calibration figures
- Incorrect calculation of distances

Each student should study his numbers, and compare them with the computer calculations. Where there is a difference, checking will discover the reason.

What was the length of the course? – No one can say with certainty, but my estimate is about 1100 metres. There is no clearly-defined way to calculate course length when many measurements exist. One method is to throw away the obvious outliers and use the median measurement of the rest. This is generally reliable. Other methods have been proposed, but ultimately some judgement must be used.

Most of the measurers had numbers in reasonable agreement with the above. The rest will improve with more practice. **In only one day we saw an enormous improvement – more riding practice will certainly improve each measurer's riding.**

The test course was almost entirely curved, with one tricky spot where the road took an s-bend. As a result, measurements had more variation than would be the case if there had been more straight parts. The students did well to get their results.



S-curve in the course

All students have now learned the most important part of course measurement – the riding of a tight, correct line, following the *Shortest Possible Route*. All the calculation in the world cannot correct the results of a bad ride. The students are ready for more measurement work. And all are now officially proclaimed as IAAF Measurers, grade “C.”

Upgrading from “C” to “B”

Six measurers (one from each country) were given copies of *Course Measurement Procedures*. The others will receive their copy with this report. In this book are instructions and forms. Students are encouraged to submit measurements to me using these forms and procedures. When all is correct, I will issue a USA Track & Field Certificate of Accuracy for the course. After a student has successfully applied for and been granted 4 or 5 USATF certificates, I will recommend them for upgrading to “B” level.

A Personal Note

I had a wonderful time conducting this seminar. All of the students were enthusiastic and eager to learn, and many perceptive questions were asked. This is a good sign – an inquiring mind will learn quickly. The improvement between day 1 and day 2 was impressive. I was very happy to see it. I am confident that as the measurers work in their countries they will improve. In several cases, little improvement is possible, as results showed they are already well along.

My thanks to Lenford Levy and Conrad Francis, without whose work this seminar would not have happened. I would have hated to miss it.



Peter S. Riegel
IAAF “A” Measurer
IAAF Measurement Instructor
May 29, 2003

Copies of this report sent to:
All Seminar Participants
Lenford Levy, IAAF RDC, San Juan
Conrad Francis, Grenada Athletic Association
Pierre Weiss, IAAF
IAAF Measurement Administrators
Bernie Conway
Dave Cundy
Jean-Francois Delasalle
John Disley
Hugh Jones – AIMS Secretary

Grenada National Stadium Complex

Layout of parallel calibration courses

Two calibration courses were laid out on the peripheral road of the complex. One was on the stadium side of the road, and the other was on the opposite side. Pete Riegel, as head tapeman, laid out a length which he measured at 3 x 30 metres plus 9.858 metres, on the stadium side of the road. Total length 99.858 metres. Pete then placed pieces of masking tape approximately opposite, on the water side, and marked them.

The group was divided into two teams, each using one of Pete's 30 metre steel tapes. One tape was divided into millimetres. The other was divided to centimetres. Each team measured the marks. They then traded places and tapes and each checked the other side of the road. Measurements were as follows:

Stadium Side	99.88	Opposite Side	99.467
	99.856		99.493
	99.88		99.464
Average	99.872	Average	99.47467

An amount was added to each course to bring it to an even 100.00 metres, as follows:

Stadium Side	0.128	Opposite Side	0.525
Final Length	100.000 metres		100.000 metres

No temperature adjustment was made, as temperatures in the area almost always exceed 20C, and Pete felt it would only add confusion at this early stage of learning. In general, in the tropics, temperature adjustments may safely be ignored.

GRENADA MEASUREMENT SEMINAR - DAY 1 ACTIVITY - MAY 23, 2003

Grenada National Stadium Complex

Calibration course = 100.00 metres

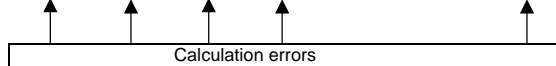
Participants rode the course, obtaining the following counter readings:

RAW MEASUREMENT COUNTS FOR ALL PARTICIPANTS

Measurer	CH	AP	JD	LG	RM	OM	AD	BR	AB	AT	CC	PR
Bike No	8		2	4	5	6	3	4	2	7	1	6
Precal 1	1163	1203	1100	1184	1194	1191	1181	1184	1102	1188	1201	1189.5
Precal 2	1162	1199	1099	1182	1196	1190	1179	1184	1100	1187.5	1204	1188.5
Precal 3	1163	1200	1100	1182	1195	1193	1179	1183	1101	1187	1203	1189
Precal 4	1163	1198	1099	1181	1195	1188	1180	1184	1100	1187.5	1202	1189
S/F (1)	24704	74580	25457	15850	27547	66285	26575	50169	81533	25075	26000	17170
S/F (2)	37546	87907	37642	28944	40721	79811	39648	63244	93685	38186	39300	30265
S/F (3)	50431	101217	49863	42030	53893	92977	52720	63322	105824	51326.5	52611	32700
S/F (4)								76411				45796
Postcal 1	1169	1196	1097	1185	1192	1192	1178	1184	1099	1189	1206	1188
Postcal 2	1157	1198	1097	1182	1193	1191	1180	1183	1100	1188	1202	1188
Postcal 3	1163	1196	1097	1184	1193	1192	1178	1183	1098	1189	1204	1188
Postcal 4	1163	1196	1098	1184	1194	1193	1179	1183	1100	1188	1202	1188
Reported Length (1), metres	1103.23	1111.14	1108.3	1102.36	1102.25	1134.32	1107.5	1103.67	1103.62	1102.52	1104.46	1100.71
Reported Length (2), metres	1106.67	1109.64	1111.6	1104.05	1102.08	1104.13	1107.42	1104.85	1102.44	1105.01	1105.38	1100.79

RESULTS AS CALCULATED BY PETE RIEGEL FOR THIS REPORT

Measurer	CH	AP	JD	LG	RM	OM	AD	BR	AB	AT	CC	PR
Precal 4-ride average, counts	1162.75	1200	1099.5	1182.25	1195	1190.5	1179.75	1183.75	1100.75	1187.5	1202.5	1189
Postcal 4-ride average, counts	1163	1196.5	1097.3	1183.75	1193	1192	1178.75	1183.25	1099.25	1188.5	1203.5	1188
Precal constant, counts per metre	11.6391	12.012	11.006	11.8343	11.962	11.9169	11.8093	11.8493	11.0185	11.8869	12.037	11.9019
Postcal constant, counts per metre	11.6416	11.977	10.983	11.8493	11.9419	11.9319	11.7993	11.8443	11.0035	11.8969	12.047	11.8919
Day's constant (average) counts per metre	11.6404	11.9945	10.995	11.8418	11.9519	11.9244	11.8043	11.8468	11.011	11.8919	12.042	11.8969
Precal 4-ride variation, counts	1	5	1	3	2	5	2	1	2	1	3	1
Postcal 4-ride variation, counts	12	2	1	3	2	2	2	1	2	1	4	0
Course length (1), counts	12842	13327	12185	13094	13174	13526	13073	13075	12152	13111	13300	13095
Course length (2), counts	12885	13310	12221	13086	13172	13166	13072	13089	12139	13140.5	13311	13096
Course length (1), metres	1103.23	1111.09	1108.3	1105.74	1102.25	1134.31	1107.48	1103.67	1103.62	1102.52	1104.46	1100.71
Course Length (2), metres	1106.92	1109.68	1111.5	1105.07	1102.08	1104.12	1107.39	1104.85	1102.44	1105	1105.38	1100.79
Reported (1) - Calculated (1)	0.00	0.05	0.04	-3.38	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00
Reported (2) - Calculated (2)	-0.25	-0.04	0.07	-1.02	0.00	0.01	0.03	0.00	0.00	0.01	0.00	0.00



GRENADA MEASUREMENT SEMINAR - DAY 2 ACTIVITY - MAY 24, 2003

Grenada National Stadium Complex

Calibration course = 100.00 metres

Participants rode the course, obtaining the following counter readings:

RAW MEASUREMENT COUNTS FOR ALL PARTICIPANTS

Measurer	CH	AP	JD	LG	RM	OM	AD	BR	AB	AT	CC	PR
Bike No	4	8	2	8	5	6	3	4	1	7	1	6
Precal 1	1183	1171	1100	1163	1193	1193	1180	1185	1202	1188.5	1205	1189
Precal 2	1184	1168	1099	1163	1193	1191	1181	1185	1200	1189.5	1204	1190
Precal 3	1182	1167	1096	1161	1193	1190	1180	1185	1203	1189.5	1203	1188.5
Precal 4	1185	1165	1099	1160	1194	1190	1180	1184	1202	1189.5	1203	1189.5
S/F (1)	31358	18283	20096	80587	16479	7706	68612	80490	74632	66798	14550	48300
S/F (2)	44449	31217	32269	93413	29663	20856	81649	93560	87883	79912	27815	61408
S/F (3)	57545	44116	44432	106241	42823	33989	94690	106625	101106	56	41075	74512
S/F (4)										13172		
Postcal 1	1183	1168	1099	1162	1193	1191	1180	1184	1200	1189	1205	1190.5
Postcal 2	1184	1170	1099	1163	1204	1192	1181	1184	1201	1188.5	1205	1189
Postcal 3	1182	1167	1099	1161	1199	1190	1180	1184	1200	1189	1203	1189
Postcal 4	1184	1169	1098	1164	1186	1190	1181	1186	1202	1189	1205	1189.5
Reported Length (1), metres	1105.14	1106.14	1106.91	1102.57	1102.74	1103.01	1102.82	1102.2	1103.1	1101.78	1100.53	1100.99
Reported Length (2), metres	1105.56	1103.15	1106.01	1102.74	1100.73	1101.59	1103.16	1101.78	1100.77	1101.87	1100.12	1100.65

RESULTS AS CALCULATED BY PETE RIEGEL FOR THIS REPORT

Measurer	CH	AP	JD	LG	RM	OM	AD	BR	AB	AT	CC	PR
Precal 4-ride average, counts	1183.5	1167.75	1098.5	1161.75	1193.25	1191	1180.25	1184.75	1201.75	1189.25	1203.75	1189.25
Postcal 4-ride average, counts	1183.25	1168.5	1098.75	1162.5	1195.5	1190.75	1180.5	1184.5	1200.75	1188.875	1204.5	1189.5
Precal constant, counts per metre	11.8468	11.6892	10.9960	11.6291	11.9444	11.9219	11.8143	11.8593	12.0295	11.9044	12.0495	11.9044
Postcal constant, counts per metre	11.8443	11.6967	10.9985	11.6366	11.9670	11.9194	11.8168	11.8568	12.0195	11.9006	12.0570	11.9069
Day's constant (average) counts per metre	11.8456	11.6929	10.9972	11.6329	11.9557	11.9207	11.8156	11.8581	12.0245	11.9025	12.0533	11.9056
Precal 4-ride variation, counts	3	6	4	3	1	3	1	1	3	1	2	1.5
Postcal 4-ride variation, counts	2	3	1	3	18	2	1	2	2	0.5	2	1.5
Course length (1), counts	13091	12934	12173	12826	13184	13150	13037	13070	13251	13114	13265	13108
Course length (2), counts	13096	12899	12163	12828	13160	13133	13041	13065	13223	13116	13260	13104
Course length (1), metres	1105.14	1106.14	1106.91	1102.57	1102.74	1103.13	1103.38	1102.20	1102.00	1101.78	1100.53	1100.99
Course Length (2), metres	1105.56	1103.15	1106.01	1102.74	1100.73	1101.70	1103.71	1101.78	1099.67	1101.95	1100.11	1100.65
Reported (1) - Calculated (1)	0.00	0.00	0.00	0.00	0.00	-0.12	-0.56	0.00	1.10	0.00	0.00	0.00
Reported (2) - Calculated (2)	0.00	0.00	0.00	0.00	0.00	-0.11	-0.55	0.00	1.10	-0.08	0.01	0.00

