IAAF International Association of Athletics Federations
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MEASUREMENT SEMINAR

MONTERREY, MEXICO
November 2 to 4, 2002

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By request from the Mexican Athletic Federation (FMA}, Lenford Levy from the regional IAAF requested to Pete Reigel (Americas measurement Administrator) a measurer that could give a seminar in Mexico. These conversations started on March of 2002; on the dates mentioned above we finally held the seminar on the volunteer measurer was Pedro Zapata (B measurer from Puerto Rico) from here on Pedro. The seminar was organized by Luciano Ramirez which has attended a couple seminars in the past and was appointed by FMA for the overall coordination of the seminar. Twenty participants were gathered representing all regions from Mexico, they were coaches, race directors, accountants, triathletes and well rained people on the athletics environment.

Participants

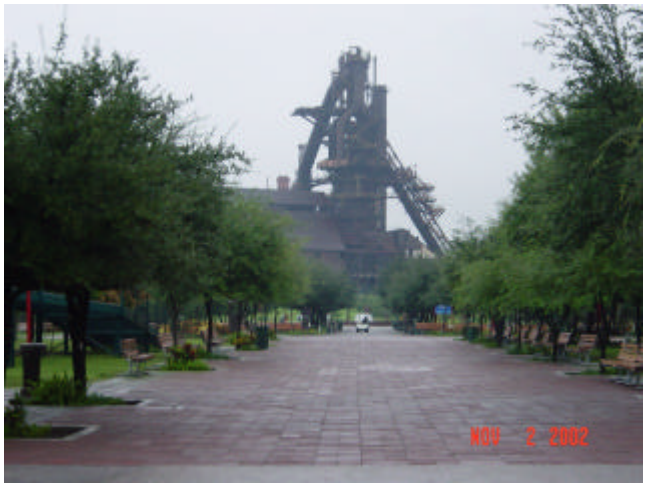
#	*Name*	*City*	*Country*
1	Pedro Zapata **Instructor**	Carolina	Puerto Rico
2	Luciano Mendoza Ramirez **Organizer**	Monterrey	Mexico
3	Jose Guadalupe Lopez Salazar	Cancun	Mexico
4	Rafael Valenzuela Ortega	Xalapa	Mexico
5	Juan Meave Melchor	Saltillo	Mexico
6	Felipe Suarez Arias	Toluca	Mexico
7	Angel Garcia Ramirez	Tampico	Mexico
8	Jose Antonio Baltazar Pallares	Tijuana, B.C.	Mexico
9	Arturo Duran Sanchez	Tlaxcala, Tlax	Mexico
10	Gerardo Cervantes Padilla	Monterrey	Mexico
11	Daniel Pinto Aranda	Merida	Mexico
12	Regulo Barbosa Muniz	Santa Catarina,N.L.	Mexico
13	Javier Noriega Guzman	Chihuahua	Mexico
14	Cecilia Miranda Mijangos	D.F	Mexico
15	Cristina Sliva Martinez	Quintana Roo	Mexico
16	Jose Luis Hernandez Domninguez	Tlaxcala	Mexico
17	Raul Ortega Lopez	JALISCO	Mexico
18	Martin de los Santos Jimenez	JALISCO	Mexico
19	Eliud Azarrel Gutierrez Fuentes	D.F	Mexico
20	Rodrigo Ramirez Puente	N.L.	Mexico
21	GABRIEL JUAREZ GARCIA	SAN LUIS POTOSI	Mexico
22	REGINO GALVAN	NUEVO LEON	Mexico

Assistant Maximo Del Castillo ytoamax@hotmail.com

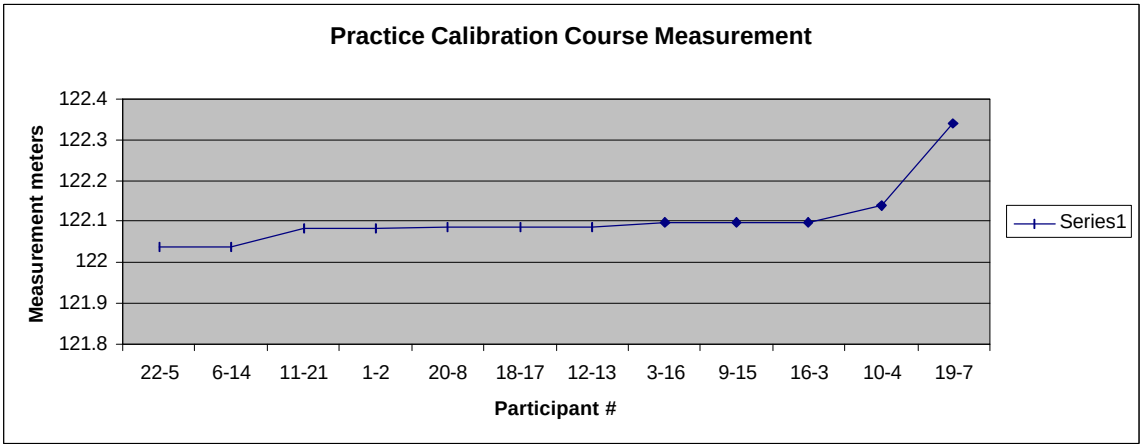
The seminar was held on Monterrey, Mexico on the Hotel Antaris Cintermex. I arrived around 8:00 PM at the airport and Maximo was waiting for me, from the airport we drove about 20 min. to the hotel and met Luciano Ramirez (seminar organizer), at that moment everything seemed wonderful for the seminar, nice hotel, great classroom with the table's chairs and Board already set up. We got together with others participants and enjoy a dinner at the hotel restaurant; all meals were served for all participants in a delicious Mexican traditional cousin in a buffet style, all you can eat. All my plates were in a combination with a lie for drink. (1 pound of tortillas with a diet coke)

Luciano managed to select a perfect setting for a course, the hotel classroom, the coffee Breaks and the hands on training site. On Saturday morning all participants were at 8:00 AM sharp at the classroom, Maximo and Luciano welcome everyone, after my self presentation everyone was ask to present themselves.

Students were first introduced with a little history of how the Calibrated Bicycle Method was developed and the importance of the SPR (shortest possible route). The Jones Counter was illustrated, we went thru all the steps needed for a good measurement of courses and performed various exercises to determine the constants from the calibrations course. A theorical measurement was practiced on the classroom starting on the phylosofy of the calibration course and temperature correction to the steel tapes, proper technique to measure and document the calibration course, exercises on calibrations rides to determine the constants and course theoretical measurement. We discussed the requirements for record quality courses, this topic raised many questions but all students understood why the requirements. The SPR plus SCPF were explained a lot. Around 10:30 AM we walked to the Parque Fundidora, now a park but before a race car course and before, a steel manufacturing industry.



We had rain or mist of rain all the time and we decided that it was too wet to practice the layout of the calibration course in the outdoors. Withing the park an old shed of about 200 meters long was selected but only 120 meters were usable. Teams of two students were form and they practiced the philosophy for a good measuring of the calibration course. Only one measure was done by each student but everyone was able to measure.



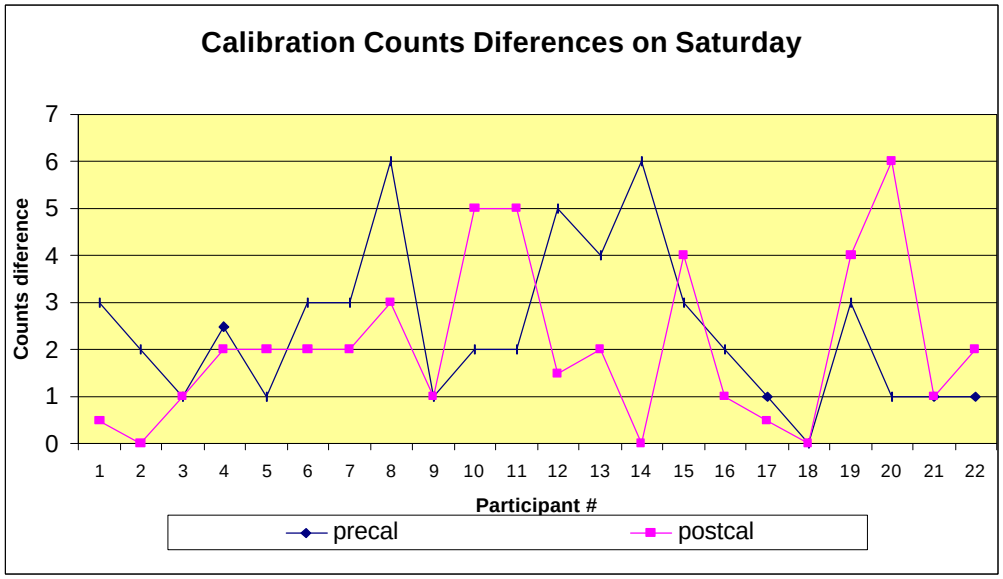
We used 3 steel tapes, one of 50 meters and 2 of 30 meters. One of the 30 mt. was missing the beginning of it and it was hard for group 19/7 to determine the right measurement. Everyone was happy with this lesson.

Lunch time came along; we all walked back to the hotel to have a taste of the great Mexican cuisine once more. Two PM was the time set for meeting again. After lunch Luciano, Maximo and I headed back to the park and measured twice the official calibration course that we intent to use on the afternoon. With the collaboration of other students we were able to use a plastic tape for the intervals. The course was laid on the straight way of the race track and marked at beginning and finish points.

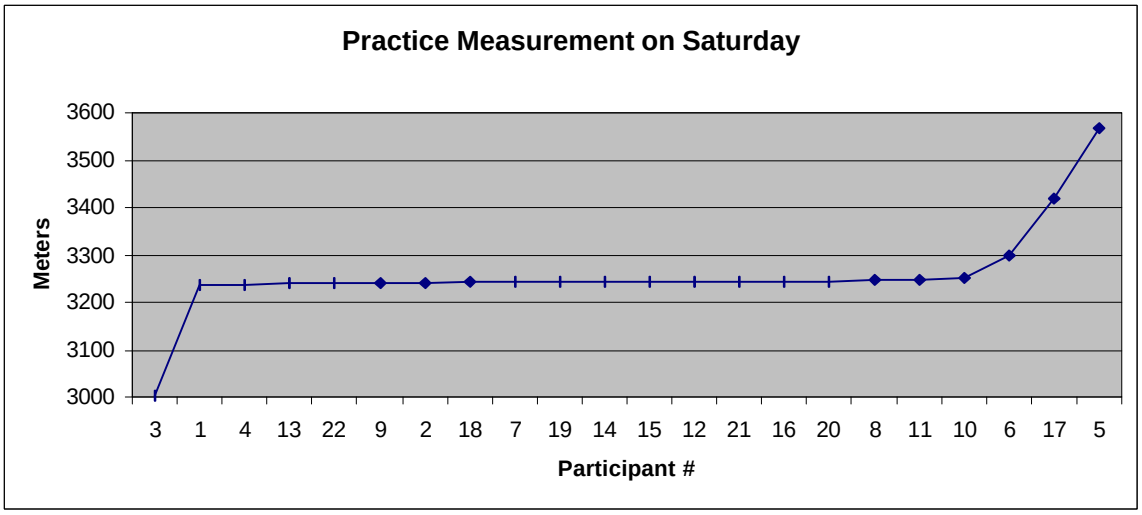
At 2 PM we meet all students back on the hotel lobby were all the bicycle were waiting for us. The bikes were not on 100% shape but they served their purpose. They were loaned by a local repair shop witch had them laying around, my bike and another student bike suffered broken pedals, so long for those two. At the hotel lobby entrance students with the assistance of Luciano and Pedro installed and tested the Jones counters.

We all walked back to the wonderful training site (old race car track) were I was told it was 3,400 meters long. No cars are allowed on the track, just runners and bike riders, it couldn't be better. We reached that starting line of the calibration point witch happened to be the starting line of the practice course for the measurement. We all got in the bikes and made a recognition ride to warm up around the course, it was just beautiful. I noticed great examples of tight cornering from left to right and right to left plus straightway. Pedro explained the technique of riding a bike over the calibration course and here they went, the calibration course was so wide that we manage to fit about 8 students at a time.

All students performed their calibration passes and they were enjoining it so much that they performed their each individual calculation of their constant immediately after the run. I saw good rides and no so good rides, one student has not ride a bike in the last 11 years and other admitted that they were shaky sometimes specially on the start.

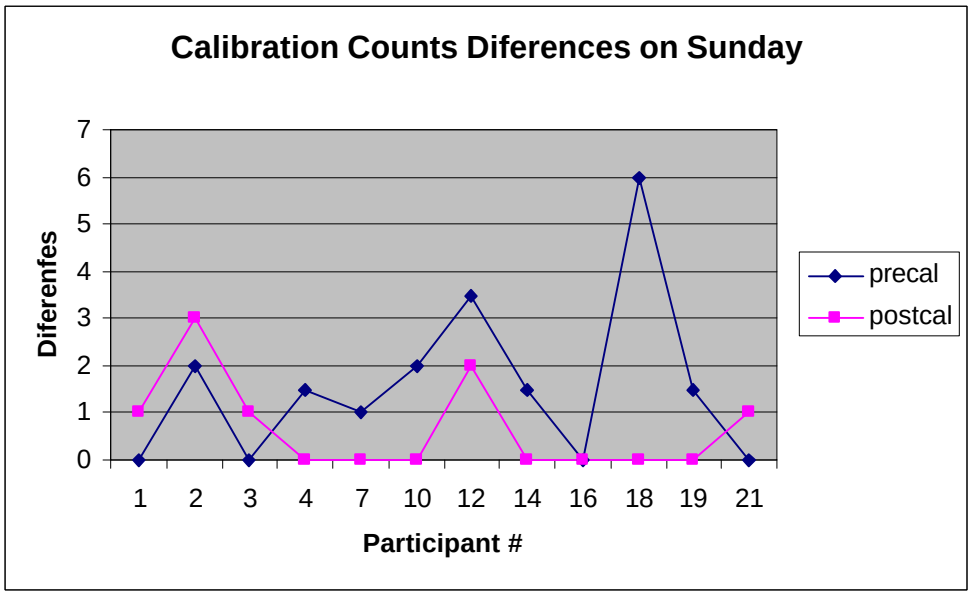


From this point we started measuring the course. Students started between each other with intervals of about 3 min. They were in their own, after every one finished with the measurement we performed the last 4 post-calibration rides. Every one was anxious to see their results, we got back to the training room and I explained the whole process of my calculations in order to obtain the course measurement. All participants performed their respective calculations by hand and Pedro obtained everyone's data into his computer to verify each one figures. Some of the students made mistakes on the constant calculations and other on the multiplication but Pedro was able to catch all of them and explained each one were they have mistaken.

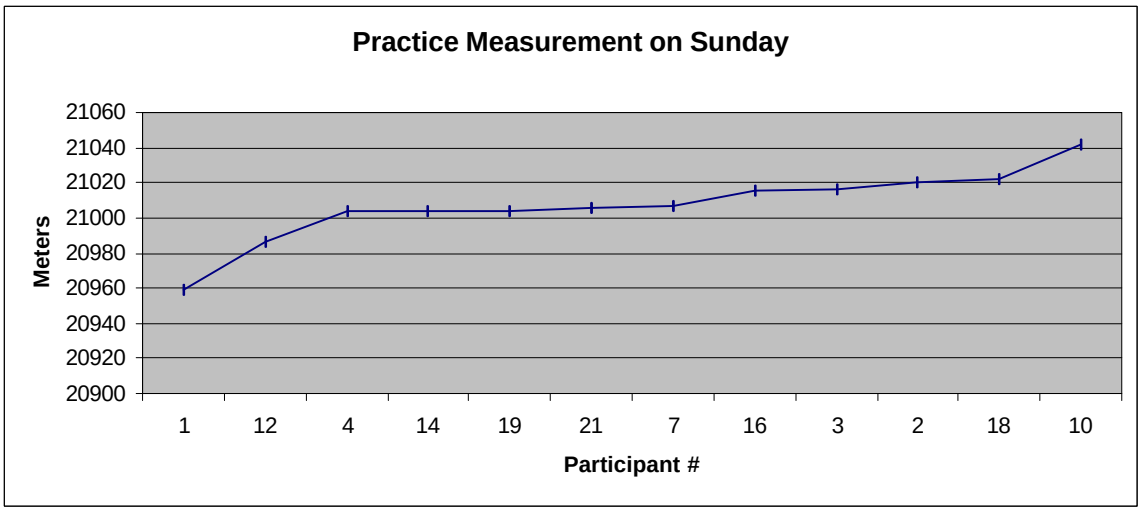


Student number 3 told Pedro that his counter was not working for a while and he noticed the situation and fix it during the ride. Student 5 did not follow the SPR at all. Student 17 did not follow well the course thinking on SPR, he had problems riding the bike.

Spanish writing reference material was given to each student that night. Saturday work section ended about 9:00 PM. Luciano selected a group of 10 riders for what Pedro called the final exam, on Sunday we are to ride a course of aprox. 21k and the other students not riding were to follow on car to oversee the measurement.



Around 8:00 Am on Sunday we were at the calibration course, performed the calibration and headed for the final exam starting line. All students were eager to start; we had the escort from a police car, police bike and two other cars from the participants. Luciano led the group at a considerable speed and Pedro dropped to the back to take advantage from the lead to make the shortest possible route and show it to the students that were following him. This instruction proved to be a success, since the students following Pedro were able to compare the riding thru traffic technique as well as the shortest possible route philosophy.



We performed the final post-calibration runs and headed back to the hotel. The Jones counters were removed from the bikes and each participant kept their own. After a 30 min. shower break and back in the classroom we performed the measurement of the course and discussed the differences between the measurements just made. Pedro explained how to make the adjustments to the course and gave full details on how to prepare and document a course in a map. Certificates of participation were given to all participants.

Items with special emphasis

a. The length of the calibration course, more than 300 meters but 500 mts. as ideal. No more than 2 counts difference for the 300mt. course.
b. SPR Shortest possible route, with the high density of traffic on Mexico extra precautions has to be on place to have a good course measurement. This was clear demonstrated on Sunday's measurement. They have to ride in the shortest possible route no matter what.
c. Nice agreement between each measurement, measure the course at least twice with minimal difference between each measurement.
d. Document your job on a good map.

Conclusion

a. The seminar was well organized and the facilities couldn't be any better
b. The participants demonstrated their interest on the seminar; practice will account for the deviations on the calibration course and math mistakes.
c. Looks like the FMA wants to establish some kind of quality control over the more serious events that are willing to have the course certify, they should work closely with the America's administrator.
d. The shortest possible route has to be in the measurers mind all the time.

Special thanks to Luciano and Maximo for looking to all seminars details and the lunch at El Rey Del Cabrito. Also the Tequila was great.

Calibration course measurement (practice)

Date	Time						
02/11/02	1030am	RAINY					
Temperature = C		20	at start				
Temperature = C		18	at end				
		19	average				
Group	1	2	3	4	5	6	7
Lead Tapeman #	20	18	3	19	10	9	12
Following #	8	17	16	7	4	15	13
Times	6	6	6	5	6	6	6
Meters Used	20	20	20	20.4	20	19	20
Additional	2.09	2.09	2.1	20.34	2.14	8.1	2.09
		2.09					
Total Dist.	122.09	122.09	122.1	122.3	122.1	122.1	122.1
Temperature correction =	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
Corrected length =	122.06	122.06	122.07	122.31	122.11	122.07	122.06
Group	8	9	10	11	12	13	
Lead Tapeman #	22	9	6	16	11	1	
Following #	5	15	14	3	21	2	
Times	6	6	6	6	6	6	
Meters Used	20	20	20	20	20	20	
Additional	2.04	2.1	2.04	2.1	2.085	2.085	
Total Dist.	122.04	122.1	122	122.1	122.1	122.1	
Temperature correction =	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	
Corrected length =	122.01	122.07	122.01	122.07	122.06	122.06	

Raw Data for Practice Loop

			377.06	Calibration	Course	Mea.		
	Date		Temp-F					
	nov.2		20	Mist				
Precalibration								
Rider Number	1	2	3	4	5	6	7	
start reading	134194	857620	42770	45460	59898	63980	48940	423(
1st	138674.5	862280	47052	49915.5	64182	68458	53817	465(
2nd	143152	866937	51332	54367	68463	72993	58694	508(
3rd	147631.5	871598	55613	58820	72745	77406	63570	551(
4th	152109	876256	59894	63273	77030	81881	68444	594(
Begin Loop	152109	876300	76050	82110	163340	138410	68700	600(
half	168995	893890	89509	98897			87130	
End Loop	190592	916374	110185	120365	203907	177587	110666	970(
Post-calibration								
Rider Number	1	2	3	4	5	6	7	
start reading	190592	916374	110190	120370	203910	177750	110770	970(
1st	195071	921031	114473	124821	208194	182223	115648	101308
2nd	199549.5	925685.5	118755	129271	212477	186695	120522	1056(
3rd	204030	930348.5	123037	133722	216761	191168	125397	1098(
4th	208508.5	935005.5	127319	138175	221047	195639	130273	114179
Calculated Values								
Rider Number	1	2	3	4	5	6	7	
precal1	4480.5	4660	4282	4455.5	4284	4478	4877	429
precal2	4477.5	4657	4280	4451.5	4281	4535	4877	429
precal3	4479.5	4661	4281	4453	4282	4413	4876	429
precal4	4477.5	4658	4281	4453	4285	4475	4874	429
Average	4478.75	4659	4281	4453.25	4283	4475.25	4876	429
Counts meter	11.87808	12.35612	11.3536	11.8105	11.359	11.8688	12.932	11.382
Counts meter x 1.001	11.88996	12.36848	11.365	11.8223	11.37	11.8807	12.945	11.3941
Variation, counts/4rides	3	2	1	2.5	1	3	3	
postcal1	4479	4657	4283	4451	4284	4473	4878	4288
postcal2	4478.5	4654.5	4282	4449.5	4283	4472	4874	4291
postcal3	4480.5	4663	4282	4451.5	4284	4473	4875	428
postcal4	4478.5	4657	4282	4453	4286	4471	4876	4291
Average	4479.125	4657.875	4282.25	4451.25	4284.3	4472.25	4875.8	4289.87
Counts meter	11.87908	12.35314	11.3569	11.8052	11.362	11.8608	12.931	11.3771
Counts meter x 1.001	11.89096	12.36549	11.3683	11.817	11.374	11.8727	12.944	11.3885
Variation, counts/4rides	0.5	0	1	2	2	2	2	
Average constant	11.89046	12.36699	11.3666	11.8196	11.372	11.8767	12.944	11.3913
Counts obtained	38483	40074	34135	38255	40567	39177	41966	3699
Course length	3236.46	3240.401	3003.09	3236.57	3567.3	3298.65	3242.1	3247.37

Raw Data for Practice Loop

377.06 Calibration course measurement

Precalibration

Rider Number	9	10	11	12	13	14	15	16
start reading	45330	59519	44940	59810	63240	44500	51024	44200
1st	49810	63986	49449	64281	67728	48943	55980	48742
2nd	54293	68447	53954	68748	72213	53383	60931	53285
3rd	58773	72913	58459	73216	76697	57824	65881	57827
4th	63252	77378	62966	77682	81181	62261	70834	62371
Begin Loop	81420	77653	63219	77820	137920	80250	71261	102678
half	98336	94598	80287	94712	154856	97035	90004	119861
End Loop	119947	116187	102081	116279	176497	118471	113896	141804

Post-calibration

Rider Number	9	10	11	12	13	14	15	16
start reading	119950	116188	102146	116280	176590	118500	113896	141810
1st	124429	120655	106658	120747	181079	122939	118849	146352
2nd	128908	125116	111167	125212	185565	127378	123800	150898
3rd	133388	129579	115673	129679	190054	131817	128755	155440
4th	137868	134041	120180	134144	194541	136256	133704	159981

Calculated Values

Rider Number	9	10	11	12	13	14	15	16
precal1	4480	4467	4509	4471	4488	4443	4956	4542
precal2	4483	4461	4505	4467	4485	4440	4951	4543
precal3	4480	4466	4505	4468	4484	4441	4949.5	4542
precal4	4479	4465	4507	4466	4484	4437	4953	4544
Average	4480.5	4464.75	4506.5	4468	4485.3	4440.25	4952.4	4542.75
Counts meter	11.88272	11.84095	11.9517	11.8496	11.895	11.776	13.134	12.04782
Counts meter x 1.001	11.89461	11.85279	11.9636	11.8614	11.907	11.7878	13.147	12.05987
Variation, counts/4rides	1	2	2	5	4	6	3	2
postcal1	4479	4467	4512	4467	4489	4439	4953	4542
postcal2	4479	4461	4509	4465	4486	4439	4950.5	4546
postcal3	4480	4463	4506	4466.5	4489	4439	4955.5	4542
postcal4	4480	4462	4507	4465.5	4487	4439	4949	4541
Average	4479.5	4463.25	4508.5	4466	4487.8	4439	4952	4542.75
Counts meter	11.88007	11.83698	11.957	11.8443	11.902	11.7727	13.133	12.04782
Counts meter x 1.001	11.89195	11.84881	11.9689	11.8561	11.914	11.7844	13.146	12.05987
Variation, counts/4rides	1	5	5	1.5	2	0	4	1
Average constant	11.89328	11.8508	11.9663	11.8588	11.911	11.7861	13.147	12.05987
Counts obtained	38527	38534	38862	38459	38577	38221	42635	39126
Course length	3239.392	3251.594	3247.62	3243.09	3238.9	3242.89	3243	3244.315

Raw Data for Practice Loop

377.06 Calibration course measurement

Precalibration

Rider Number	17	18	19	20	21	22
start reading	62470	41090	43430	43330	44700	41590
1st	66918.5	45310	47794	47737	49285	45877
2nd	71366	49529	52155	52144	53871	50163
3rd	75813.5	53748	56518	56551	58459	54449
4th		57968	60879	60959	63044	58735
Begin Loop	127985	58100	61110	61030	63110	58735
half	145911	74051	77590.5	77702	80454	74923
End Loop	168323.5	94410	98646.5	98980	102606	95596

Post-calibration

Rider Number	17	18	19	20	21	22
start reading	168330	94410	98650	98980	102610	95596
1st	172775.5	98628	103008	103387	107197	99882
2nd	177220	102845	107366	107790	111783	104170
3rd	181664	107064	111728	112194	116370	
4th	186109	111282	116082	116595	120956	

Calculated Values

Rider Number	17	18	19	20	21	22
precal1	4448.5	4220	4364	4407	4584.5	4287
precal2	4447.5	4219	4361	4407	4586.5	4286
precal3	4447.5	4219	4363	4407	4587.5	4286
precal4		4220	4361	4408	4585.5	4286
Average	4447.833	4219.5	4362.25	4407.25	4586	4286.25
Counts meter	11.79609	11.19053	11.5691	11.6885	12.163	11.3676
Counts meter x 1.001	11.80789	11.20172	11.5807	11.7001	12.175	11.3789
Variation, counts/4rides	1	0	3	1	1	1
postcal1	4445.5	4218	4358	4407	4587	4286
postcal2	4444.5	4217	4358	4403	4585.5	4288
postcal3	4444	4219	4362	4404	4587	
postcal4	4445	4218	4354	4401	4586	0
Average	4444.75	4218	4358	4403.75	4586.4	4287
Counts meter	11.78791	11.18655	11.5578	11.6792	12.164	11.3695
Counts meter x 1.001	11.7997	11.19774	11.5694	11.6909	12.176	11.3809
Variation, counts/4rides	0.5	0	4	6	1	2
Average constant	11.80379	11.19973	11.575	11.6955	12.175	11.3799
Counts obtained	40338.5	36310	37536.5	37950	39496	36861
Course length	3417.419	3242.044	3242.88	3244.84	3244	3239.13

Data for Sunday Practice

Precalibration

Rider Number	7	12	3	4	19	14
start reading	212010	222860	229880	141280	141280	141280
1st	216480	227328.5	234161	145730.5	145730.5	145730.5
2nd	220950	231794	238441	150180.5	150180.5	150180.5
3rd	225420	236261.5	242722	154632	154632	154632
4th	229889	240726.5	247003	159081	159081	159081
Begin Loop	234910	245640	268490	164300	164300	164300
End Loop	484130	494462	507357	412466	412466	412466

Post-calibration

Rider Number	7	12	3	4	19	14
start reading	487320	497630	508770	414300	414300	414300
1st	491789	502096.5	513052	418752	418752	418752
2nd	496257	506562.5	517334	423003	423003	423003
3rd	500724	511028	521615	427652	427652	427652
4th	505193	515492.5	525898	432104	432104	432104

Calculated Values

Rider Number	7	12	11	4	19	14
precal1	4470	4468.5	4281	4450.5	4450.5	4450.5
precal2	4470	4465.5	4280	4450	4450	4450
precal3	4470	4467.5	4281	4451.5	4451.5	4451.5
precal4	4469	4465	4281	4449	4449	4449
Average	4469.75	4466.625	4280.75	4450.25	4450.25	4450.25
Counts meter	11.8542	11.84593	11.35297	11.8025	11.8025	11.8025
Counts meter x 1.001	11.8661	11.85777	11.36432	11.8143	11.8143	11.8143
Variation, counts/4rides	1	3.5	0	1.5	1.5	1.5
postcal1	4469	4466.5	4282	4452	4452	4452
postcal2	4468	4466	4282	4251	4251	4251
postcal3	4467	4465.5	4281	4649	4649	4649
postcal4	4469	4464.5	4283	4452	4452	4452
Average	4468.25	4465.625	4282	4451	4451	4451
Counts meter	11.8502	11.84327	11.35628	11.80449	11.80449	11.80449
Counts meter x 1.001	11.8621	11.85512	11.36764	11.81629	11.81629	11.81629
Variation, counts/4rides	0	2	1	0	0	0
Average constant	11.8641	11.85644	11.36598	11.8153	11.8153	11.8153
Counts obtained	249220	248822	238867	248166	248166	248166
Course length	21006.3	20986.22	21015.96	21003.79	21003.79	21003.79

Data for Sunday Practice

Precalibration

Rider Number	10	18	21	16	2	1
start reading	143584	120460	133810	197181	987026	128790
1st	148052	124670	138094.5	201639	991683	133228
2nd	152513	128896	142378.5	206097	996340	137667
3rd	156979	133113	146663.5	210556	1000996	142104
4th	161445	137329	150948	215014	1005651	146542
Begin Loop	166941	142260	156320	220760	11460	151560
End Loop	416303	377610	395309	469465	271273	398477

Post-calibration

Rider Number	10	18	21	16	2	1
start reading	423437	380560	398472	472875	274653	402250
1st	427900	384777	402759	477333	279307	406687
2nd	432362	388994	407045.5	481789	283961	411122
3rd	436825	393210	411333	486246	288618	415561
4th	441288	397427	415619	490704	293275	419999

Calculated Values

Rider Number	10	18	21	16	2	1
precal1	4468	4210	4284.5	4458	4657	4438
precal2	4461	4226	4284	4458	4657	4439
precal3	4466	4217	4285	4459	4656	4437
precal4	4466	4216	4284.5	4458	4655	4438
Average	4465.25	4217.25	4284.5	4458.25	4656.25	4438
Counts meter	11.8423	11.18456	11.36291	11.82372	12.34883	11.77001
Counts meter x 1.001	11.8541	11.19574	11.37428	11.83554	12.36118	11.78178
Variation, counts/4rides	2	6	0	0	2	0
postcal1	4463	4217	4287	4458	4654	4437
postcal2	4462	4217	4286.5	4456	4654	4435
postcal3	4463	4216	4287.5	4457	4657	4439
postcal4	4463	4217	4286	4458	4657	4438
Average	4462.75	4216.75	4286.75	4457.25	4655.5	4437.25
Counts meter	11.8356	11.18323	11.36888	11.82106	12.34684	11.76802
Counts meter x 1.001	11.8475	11.19442	11.38025	11.83288	12.35919	11.77979
Variation, counts/4rides	0	0	1	0	3	1
Average constant	11.8508	11.19508	11.37726	11.83421	12.36018	11.78078
Counts obtained	249362	235350	238989	248705	259813	246917
Course length	21041.8	21022.63	21005.84	21015.76	21020.16	20959.3