

The Training Program for a 400m-200m Sprinter

In 1996, Michael Johnson became the first man in Olympic history to win both the 200- and 400-meter races. What is it about these two races that makes it seem nearly impossible to be successful in both? If an athlete is willing to work relentlessly hard to develop not only the endurance for the 400m but also is blessed with the power needed for the 200m, I feel that a double in the 400m and 200m is very much in reach. *well stated*

Both of these races are similar in that they are both sprints. But in their own ways the 400m and 200m are entirely different races. The 200-meter race is more of an intense, attacking style of sprinting. With Michael Johnson's new record of 19.32, it is plain to see that the emphasis of this race is very similar to the 100-meter race, pure speed. The tactics are simply to get out of the starting blocks fast, build up as much speed as possible on the curve, and then just give it everything you have until the finish line (5). It is so fast, that there is very little time for lactic acid buildup and the athlete depends almost entirely on his phosphocreatine and anaerobic glycolysis systems. Aerobic metabolism will make some contribution to ATP formation but it is only a very small contribution (approximately 10%)(4).

The 400-meter race is certainly fast but endurance is now very much involved. The 400-meter record was set in 1988 by Butch Reynolds with his 43.29. This race is a specialized event, and few elite 400-meter athletes excel at any other distance (1). Much of the reason behind this specialization is biochemical. Unlike the 200-meter race, the aerobic system is now an important energy system. The ATP-phosphocreatine system and anaerobic glycolysis are still the dominant energy systems but in a 400-meter race lactic acid accumulation is an important limitation. To provide energy without producing lactic acid the athlete may rely on the aerobic system for approximately 25% of the ATP needed for the race (5). Therefore, a 400-meter athlete must delicately integrate all three of these energy systems in his training. To have an aerobic base large enough to survive the 400m, but also have the ATP-phosphocreatine and anaerobic glycolysis systems developed maximally to support the blazing speed, is the dilemma facing the coach of an athlete pursuing a 400-200 double.

This paper will outline four months of the workout routines I made up for one of my athletes (MJ), this year. MJ was a 23 year old, college senior sprinter who had competed in track throughout high school and was now in the fourth and final year of his college eligibility. He had no major injuries previously and was very willing to sacrifice for league's first 400m-200m title. League finals were on May 11 so obviously this was the peak event for our season. His best times had progressed throughout his college career. In the 400m, he had dropped his freshman time of 49.70 sec. to a 48.30 sec., in his junior season. His 200m time had also progressed, from a freshman 22.50 sec. to a junior 21.80 sec.. His goals for his final year were a 47.50 in the 400m and a 21.50 in the 200m.

Starting in October our season began. I split his season into three phases, each lasting approximately two to three months. There was no magical moment that separates these phases but instead there is a shift of training emphasis. Mainly, as the year progressed I decreased the volume of his training while increasing the intensity of his practices. In this paper, I only cover the second two phases of MJ's season. In general, his first phase was done to get MJ to a level of cardiovascular fitness that would allow him to do the upcoming workouts as well as get his legs prepared for the harder running to come. This phase lasted from October to December where I had him run 3-5 miles a day.

The "true" season began once MJ returned from Christmas vacation. I set Monday's and Thursday's as his hard days. For all of these intervals, precision was the key. I discussed the pace for each interval, with MJ, before each workout began. With my watch I would blow a horn at each of the 100m splits times we had previously discussed. On the track, I had placed traffic cones at every 100m mark so that MJ would arrive at the cone as the horn was being blown. Precision was also vital in the amount of rest time or else the desired effect would have been diminished. With this assembly line groove MJ was getting maximal results from his workouts.

With Monday's and Thursday's being our hard, high volume days I set aside Wednesday's and our speed and technique days. With these intervals we were developing MJ's neuromuscular conditioning, for sprinting, as we emphasized precise and proper form while staying relaxed (7). I wanted a quick pace but certainly not so fast that proper technique was compromised. A casual jog back to the start sufficed as a rest interval. MJ had the tendency to tighten up in the face and upper body when he began to really work. In these sessions, I was really trying to get him to relax at these high speeds.

Monday was a very fatiguing day so I had MJ do an easy day of strides on Tuesday. Depending on how tired he was, I would have him casually stride out sprints of approximately 70 meters. Many times he would do these on the grass with his shoes off. With no time rush it was usually a very relaxing day.

Every Friday was set aside as rest day. I encouraged him to stretch and stay limber but this was really his day to physically and emotionally take a break. When racing season came along we might have a short meeting to discuss the upcoming day's goals and strategies. I would let him mull over these plans all evening so that when the race finally did come he had already mentally raced it many times before.

Before racing season Saturday was a good moderate workout. Just enough to make him work a little but nothing terribly straining. On the race days themselves, MJ would always just run the 400m and 200m. The 400m was always the first race and after that was completed I would have him do a very short jog and then sit down in the shade and mentally prepare for the upcoming 200m.

Sunday was an active "unwind" day. Early on, I had MJ do controlled sprints up a hill of about 10% grade. This hill running was beneficial in helping get more muscle recruitment compared to regular sprints (5). Later in the season I had MJ progress into some acceleration sprints. With these I just wanted him to practice a gradual acceleration so that by the time he hit the 50-60m mark he was at top speed. These were nice gradual sprints that would get him used to his top speed, for a second, and then he would stop so that this maximal effort did not need to be maintained. I had him also do some easy distance to help him loosen up from his race day on Saturday (6).

I scheduled weight training after every workout on Wednesday and Sunday. I felt that weights were very important for an athlete, such as MJ, determined to be successful in the 400-200m double. Not only does he need to have incredible sprint stamina to survive the many hard races but he needed to do everything possible to prevent injury. As the season progressed the premium quickly became durability rather than just pure speed. I felt this durability was enhanced through weight training (3).

The organization of the lifting sessions themselves was left up to the strength coach to decide. The intensity and quantity of the lifts was much like the running program with the intensity increasing and the quantity decreasing throughout the season. I recommended that squats and power cleans be the focus of the lifting programs. This was because the squat and power clean are able to utilize three times the muscle mass of any other single leg weight training exercise. Also, the exercise movements are very similar to the movements used in the sprint stride (2).

Before every workout a set warm-up routine must be emphasized. It is important to warm-up the entire body musculature and cardiovascular system in preparation for the stress it will undergo during the workout. This routine should include 5 minutes of jogging, 10 minutes of stretching, and 10 minutes of drills such as hopping, bounding, and high-knee stepping (anywhere from 50 to 100 meters) (5).

THE SEASON:

After getting back from vacation I had to ease MJ back into it. Therefore, the first week was relatively easy. Besides this first week the Monday and Thursday workouts, during January and February, were dominated by long intervals. The emphasis of these long intervals was to develop the lactate tolerance needed especially for MJ's 400m event. Through January the total distance of the hard workout ranged somewhere from 1500m to 2000 meters. The intensity was moderate but the rest times were very short so that MJ would quickly be a high lactate zone. I liked to put the higher volume intervals on Monday since it was the first "big" workout of the week. With all of MJ's track work racing spikes were worn.

During these four months, I included four microcycles each lasting four weeks. On week's ^{good} 5, 9, 13, and 17 the mileage was reduced significantly. I was trying to get MJ to progress for three weeks and then let his body recuperate for a week before we began another progression. Ultimately, MJ was progressing toward perfection but little breaks were necessary so that we would not have to deal with overtraining.

During February, the mileage ranges from 900m to 1800 meters. A small decrease from February but not much. The intensities too were increasing ever so slightly. His lactate tolerance was really starting to increase dramatically. His first race day was at the very end of February but we were honestly training right through it. I felt that it was a nice reward after two months of these difficult workouts to finally be in competition. He was very slow but strong and that was what we expected since we hadn't even trained his speed yet.

During March the competition season began. I begin to start cranking up the intensity and again decrease the distance to compensate. With the competition phase specificity becomes very important. Every Wednesday is now dedicated toward practicing his start. Because both of his ^{OK} races start from the curve I had him always start from the curve. MJ used a tape measure to make sure that his starting blocks were at the same optimal length every time. I also made him run from various lanes just in case he gets a bad draw and has to be in lane 8 on the day of the race. ^{or lane 1} Since there is no substitute for real competition I had other competitors, of about equal talent, come in and run at the same time. Start commands and procedures were done as if it were race day.

Coming into April we were at the heart of the competition phase. By the end of April everything was done at race pace or even a bit faster. Rest times were increased dramatically so that he was fresh for every one of his "races". Total distances have also dropped significantly. During the 200m race of week 14, MJ falsestarted twice and was disqualified. Therefore, I increased his start workout a little bit. His speed was really starting to pick up by this time. On week 13 he ran a 47.65 in the 400m. and a 21.70 in the 200m. The 200m time is still a little slow but with all the speed training upcoming we were not worried.

As May began the goal was finally in sight. Every interval is now a maximal effort with ^{too little} lots of time to recover. Mileage has dropped down to about 750 meters a workout. Entering week 19 MJ was really running well. I tapered him off that final week by having slower 150's on Monday and then really taking the rest of the week off, except to practice his starts. On the day of the big race he broke both of his goals by running a 47.45 in the 400m and a 21.48 in the 200. These times were just good enough to get first place in both events and therefore giving him the first 400m-200m double in league history.

January

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<u>WEEK 1</u> (1/3-1/6) Precompetition			Weights	6 mile run Easy	Rest	Controlled 6 x 200m.	1) 5 x100m. on a hill 2) 4 mile easy 3) Weights
<u>WEEK 2</u> (1/7-1/13) Precompetition	3 x 600m. @ 92 sec. w/ 3 min. T=1800m.	Strides	1) Controlled 4 x 200m. 2) Weights	4 x 350m. @ 49 sec. w/ 1:40 min. T=1500m.	Rest	4 miles @ 6min/mile	1) 5 x100m. on a hill 2) 4 mile easy 3) Weights
<u>WEEK 3</u> (1/14-1/20) Precompetition	4 x 500m. @ 76 sec. w/ 2:30 min. T=2000m.	Strides	1) Controlled 4 x 200m. 2) Weights	2 x 300m. @ 42 sec/ 1:30 2 x 250m. @ 33 s./ 65 s. 2 x 200m. @ 26 s/ 55 s. T=1500m.	Rest	4 miles @ 6 min/mile	1) 5 x100m. on a hill 2) 4 mile easy. 3) Weights
<u>WEEK 4</u> (1/21-1/27) Precompetition	4 x 500m. @ 75 sec. w/ 2:30 min. T=2000m.	Strides	1) Controlled 4 x 200m. 2) Weights	5 x 300m. @ 42 sec. w/ 1:45 min. T=1500m.	Rest	4 miles @ 6 min/mile	1) 5 x100m. on a hill 2) 4 mile easy 3) Weights

February

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<u>WEEK 5</u> (1/28 - 2/3) Precompetition	1 x 600 @ 91sec. w/ 3:00 min. 1 x 300 @ 42 sec/ T=900m.	Strides	1) Controlled 4 x 200m. 2) Weights	2 x 350m. @ 48 sec. w/ 2:00 min. 1 x 200m. @ 26 sec. T=900m.	Rest	4 miles @ 5:45 min/mile	1) 5 x 100m. on a hill 2) 3 mile easy 3) Weights
<u>WEEK 6</u> (2/4 - 2/10) Precompetition	2 x 600 @ 89 sec. w/ 3:00 min. 2 x 300 @ 40 sec. w/ 1:45 min. T=1800m.	Strides	1) Controlled 5 x 150 2) Weights	3 x 350m. @ 47 sec. w/ 2:00 min. 1 x 200m. @ 26 sec. T=1250m.	Rest	4 miles @ 5:45 min/mile	1) 5 x 100m. on a hill 2) 3 mile easy 3) Weights
<u>WEEK 7</u> (2/11 - 2/17) Precompetition	3 x 500 @ 75 sec. w/ 2:30 min. T=1500m.	Strides	1) Controlled 5 x 150m. 2) Weights	5 x 250m. @ 32 sec. w/ 1:45 min. T=1250m.	Rest	4 miles @ 5:45 min/mile	1) 5x 100m. on a hill 2) 3 mile easy. 3) Weights
<u>WEEK 8</u> (2/18 - 2/24) Precompetition	500 @ 74 s. w/ 2:30 min. 350 @ 48 s. w/ 2:00 min. 250 @ 33 s. w/ 1:40 min. 200 26s./1:20 T=1300m.	Strides	1) Controlled 6 x 100m. 2) Weights	2 x 350m. @ 47 sec. w/ 2:00 min. 2 x 250m. @ 33 sec. w/ 1:45 min. T=1200m.	Rest	Race	1) 5 x 100m. on a hill 2) 3 mile easy 3) Weights

March

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<u>WEEK 9</u> (2/25 - 3/2) Precompetition	500m. @ 73 s. w/ 1:30 min. 250m. @ 31 s. w/ 1:20 min. 300m. @ 38 s. T=1050m.	Strides	1) Controlled 6 x 100m. 2) Weights	3 x 300m. @ 38 sec. w/ 3 min. T=900m.	Rest	3 miles @ 5:30 min/mile	1) 5 x 100m. on a hill 2) 3 mile easy 3) Weights
<u>WEEK 10</u> (3/3 - 3/9) Competition	2 x 350 @ 45 s. w/ 3:00 min. 3 x 200 @ 24 s w/ 2:00min. T=1300m.	Strides	1) Starts 8 x 30m. 2) Weights	2 x 350m. @ 45 sec. w/ 3:00 min. 2 x 200m. @ 24 sec. w/ 2:00 min. T=1100	Rest	Race	1) 5 x 60 Acceleration 2) 2 mile easy 3) Weights
<u>WEEK 11</u> (3/10 - 3/16) Competition	300m. @ 36 s. w/ 3:00 min. 2 x 150m. @ 28 s/ 2:00m 2 x 250m. @ 29s/ 3:00 m T=1250m.	Strides	1) Starts 8 x 30m. 2) Weights	7 x 150 @ 18 sec. w/ 3:00 min. T=1050m.	Rest	3 miles @ 5:30 min/mile	1) 5 x 60 Acceleration 2) 2 mile easy. 3) Weights
<u>WEEK 12</u> (3/17 - 3/23) Competition	2 x 500m. @ 67 sec. w/ 5:00 min. 1 x 300m. @ 36 sec w/ 3:00min. T=1300m.	Strides	1) Starts 8 x 30m. 2) Weights	5 x 200m. @ 24 sec. w/ 3:30 min. T=1000m.	Rest	Race	1) 5 x 60 Acceleration 2) 2 mile easy 3) Weights

April

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<u>WEEK 13</u> (3/24 - 3/30) Competition	3 x 300m. @ 35 sec. w/ 5 min. T=900m.	Strides	1) Starts 5 x 50m. 2) Weights	2 x 200m. @ 23 sec. w/ 5:00min. 3 x 150m. @ 17 sec. w/ 4:00 min. T=850m.	Rest	Race	1) 5 x 60 Acceleration 2) 2 mile easy 3) Weights
<u>WEEK 14</u> (3/31 - 4/6) Competition	500m. @ 65 s. w/ 8 min. 350m. @ 42 s. w/ 7min. 300m. @ 35 s. T=1150m.	Strides	1) Starts 5 x 50m. 2) Weights	2 x 300m. @ 34 sec. w/ 7:00 min. 2 x 150m. @ 17 sec. w/ 6:00 min. T=900m.	Rest	Race	1) 5 x 60 Acceleration 2) 2 mile easy 3) Weights
<u>WEEK 15</u> (4/7 -4/13) Competition	2 x 200m @ 23 sec. w/ 5 min. 500m. @ 64 sec. T=1100m.	Strides	1) Starts 8 x 50m. 2) Weights	4 x 200m. @ 23 sec. w/ 7:00 min. T=900m.	Rest	3 miles @ 5:30 min/mile	1) 5 x 50 Acceleration 2) 1 mile easy. 3) Weights
<u>WEEK 16</u> (4/14 - 4/20) Competition	2 x 300m. @ 34.5 sec. w/ 7 min. 2 x 200m. @ 22 sec. w/ 7 min. T=1000m.	Strides	1) Starts 8 x 50m. 2) Weights	5 x 150m. @ 16.5 sec. w/ 7:00 min. T=750m.	Rest	Race	1) 5 x 50 Acceleration 2) 1 mile easy 3) Weights

May

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<u>WEEK 17</u> (4/21 - 4/27) Competition	3 x 250m. @ 28 sec. w/ 10 min. T=750m.	Strides	1) Starts 8 x 50m. 2) Weights	4 x 200m. @ 22 sec. w/ 10 min. T=800m	Rest	Race	1) 4 x 50 Acceleration 2) 1 mile easy 3) Weights
<u>WEEK 18</u> (4/28 - 5/4) Competition	4 x 200m. @ 21.8 sec. w/ 10 min. T=800m.	Strides	1) Starts 8 x 50m. 2) Weights	5 x 150m. @ 16.2 sec. w/ 10:00 min. T=750m.	Rest	3 miles @ 5:45 min/mile	1) 4 x 50 Acceleration 2) 1 mile easy 3) Weights
<u>WEEK 19</u> (5/5 - 5/11) Competition	3 x 150 @ 18 sec. w/ 10 min. T=450m.	Starts 5 x 50m.	Starts 5 x 50m.	Strides	Rest	THE BIG DAY !!	

REFERENCES

1. Bell, S. Training Patterns and Racing Tactics --400m. *Track & Field Quarterly Review* 91(1): 16-17.
2. Durck, C. Squat and Power Clean Relationships to Sprint Training. *Track & Field Quarterly Review* 91(1): 47-48.
3. Lemaire, E. Power in Sprinting. *Track & Field Quarterly Review* 91(1): 34.
4. Newsholme, E., Leech, T., and Duester, G. Keep On Running. New York: Wiley & Sons, 1994. pp. 101-102, 180, 189, 300-313.
5. Richburg, O.: Maximizing Workouts for Sprinters. *Track & Field Quarterly Review* ✓ 91(1): 10-11. 1991.
6. Tellez, T., Baughman, M., Takaha, M. University of Houston Sprint Training -- Including Strength Training. *Track & Field Quarterly Review* 91(1): 6-8.
7. Upperman, R. Training for the Sprints. *Track & Field Quarterly Review* 91(1): 13-14. 1991.

Rob,

This is an excellent program and hopefully I gave you sufficient feedback in class. See my comments on the paper itself.

My major suggestion would be:

- 1) I think the volume of training may need to be increased 50%.
Hope however, it would be at somewhat lower intensity
- 2) As mentioned, I think the paper contains too little endurance and LT.

In general, great program

Grade 92