

# Mach Sprint Drills

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I am going to try to lend a bit of a historical perspective. I must emphasize that this is my perspective and opinion based on discussion, observation as well as my coaching experience. I was first introduced to the Mach drills in 1975 by a group of Canadian athletes training in Santa Barbara Calif. They showed me the drills and gave me an article on the drills written by the originator of the drills, Gerard Mach who was the National Sprint & Hurdle coach of Canada. I was immediately attracted to the drills because I could see logic and a system to their application. (This logic and systematic approach to their application has been lost over the years, even in Canada). They did not appear that different from the drills that Bud Winter (Coach at San Jose State University and the coach of Tommy Smith, Lee Evans et al) had taught for years, but after reading Mach's article there was a logical sequence that was not there with the Winter drills. I began to use the drill with good results, but I felt that I needed to find more about the drills and how they fit into the whole system of sprint development. In 1976 the Canadians had a training camp in Southern California where I was able to see Mach coach first hand for several days. This gave me a better depth of understanding of the drills and their application. I also saw how they were applied in hamstring rehab when I watched Coach Mach work with a 400 Meter runner who had pulled his hamstring three days previously. In 1977 I met Dr. Al Bianciani, who at the time was the Coach at Cal State University Stanislaus, he had apprenticed under Mach. Al was very generous to share his knowledge of the Mach system and his interpretation with me. This was a tremendous help in understanding correct technique on the drills, coaching cues as well as their place in the whole system. In January 1978 I was able to attend a presentation by Gerard Mach where he spend three hours detailing the development of the Mach Polish Sprint School from his experimentation as an athlete to the application with athletes like Andzej Badenski and Irena Szewinska. It was an epiphany. It was an incredible system, as I look back he was far ahead of his time. The system and concepts that he had articulated in the 1950's are those concepts that every good sprint coach uses today. A cornerstone of his system was the A B & C drill series. The drills were also designed to enable the sprinter to get the repetition of work necessary to prepare to actually sprint in the adverse weather conditions that occurred inn the winter in Poland. In presentations he always pointed out that he did not have the good weather that the American sprint coaches in the west and south enjoyed, so he had to come up with alternatives.

Mach broke the stride into its components parts, knee lift, foreleg action and the push off through the drills. The "A" Drills were designed to work the knee lift component. The "B" Drills were designed to work on foreleg reach or pawing action. According to Mach "All exercises with leg extension and active down are

special exercises to strengthen the hamstrings.” (Page 6, Sprinting & Hurdling School by Gerard Mach, CTFA 1977) “The marching and skipping exercises were designed to develop the technique required for body lean, arm action, high knee lift, leg extension, and keeping the center of gravity high, but did not emphasize the strong driving forward or push forward action.” (Page 6, Sprinting & Hurdling School by Gerard Mach, CTFA 1977) The “C” Drills were designed to work on push off and extension.

My interpretation, from discussions with Gerard Mach and Biancani, as well as my extensive use of these drills over the years is that their primary benefit is not as technique drills. They are drills that specifically strengthen the muscles in postures and actions that are similar to those that occur during the sprint action. It is through strengthening in the specific positions that technique is improved. I consider them posture drills, specific strength drills and functional flexibility drills. The technical benefit is ancillary. These drills do have a place in a sprint training program if they are properly taught and constantly coached. Incorrect execution and repetition can ingrain bad habits. One of the biggest faults on the “A” series of exercises is the emphasis on knee lift at the expense of impulse off the ground. The knee lift occurs as a result of what happens on the ground. On the drills the knee should not be pulled off the ground, but driven down to create a quick strike on the ground, which will result in knee lift. Another fault that I see in execution of the drills is the rate of execution. Mach emphasized that the drill should be executed at “three steps per meter.” He also emphasized the necessity of correct arm action on the drills. Too many times I see athletes doing the drills with very passive arm action, which is incorrect.

Each drill is sub divided into a march action, a skip action and a run action. This was designated by the subscript as follows:

A<sub>1</sub> = Marching  
A<sub>2</sub> = Skipping  
A<sub>3</sub> = Running

B<sub>1</sub> = Marching  
B<sub>2</sub> = Skipping  
B<sub>3</sub> = Running

The progression was from marching to skipping to running. The drills were used daily as part of warm-up. They were actually used a workouts to emphasize either power speed or strength endurance. They were also used for rehab after hamstring pulls. For workouts the drills could be done at less than ten repetitions, less that ten meters, less than ten seconds, this was termed “Power Speed.” Mach would also add resistance to the drills in the form of a sandbag or a weight vest. If this was the case then the drills were designated as “Power Speed Mixed.” If the drills were done longer that 20 meters, more than tens reps and more than ten seconds in duration they were designated as “Strength Endurance.” If resistance was added to this then it was termed as “Strength

Endurance Mixed.” Irena Szewinska was reported to have executed series of 200 Meter  $A_2$ 's. I personally have used  $A_2$  and  $A_3$  for 4 –6 x 50 meters with a weight vest (10 % body weight) with developmental athletes.

The drills are a great lead in to teaching hurdles. The lead leg action is actually a “B” action, the trail leg is a “C” action closely coupled with an “A” action. Another aspect of the drills that picked up from Mach that I do not see applied very often is to link the drills to acceleration. For example execute an  $A_3$  for 10 Meter and change it over to an acceleration of 30 Meters. The goal here is to work a particular component of the stride and to immediately place it into the context of the whole the whole action.

In summary I feel Mach was a genius. His work has stood the test of time. If we understand that the drills are part of a complex used to develop the sprinter, hurdler, jumper then they do have a place in the daily preparation of the athlete. As a side comment it is interesting to note that Tom Tellez, coach of Carl Lewis and Leroy Burrell, did not believe in the use of drills. The bottom line is that that there are many roads to Rome!