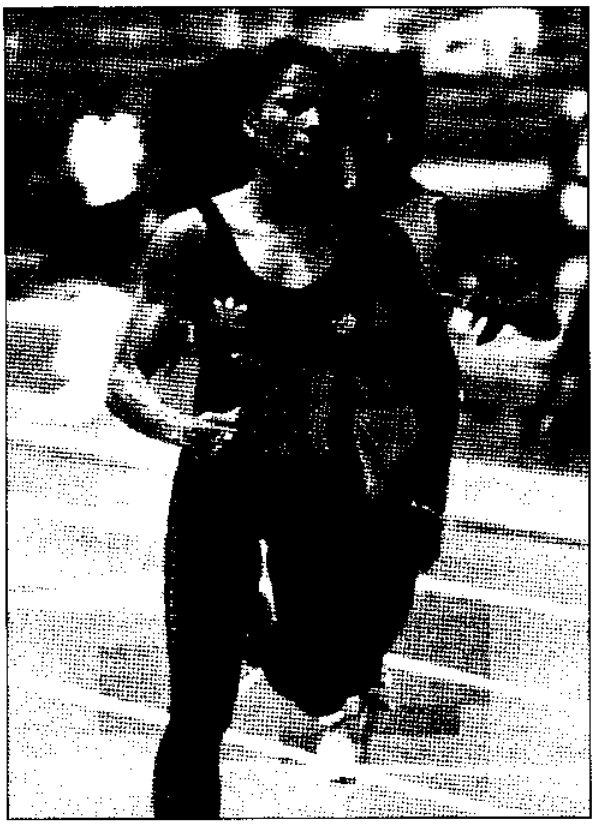
WAS FLOJO'S 100m WORLD RECORD WIND-ASSISTED?

by Nick Linthorne, Australia

The answer is certainly, Yes! I present here compelling evidence that Flojo's 100m world record of 10.49 was assisted by a wind of +5.5 m/s. Such a wind is well above the legal limit of +2.0 m/s and the performance should therefore be removed form the record books. Before discussing the evidence that led to this provocative conclusion, I must first explain why I examined the legality of the mark.



Don McAdam

Florence Griffith Joyner races to a 10.70 clocking in the Olympic Trials semifinal in 1988.

There are some performances that stick in the throat of hard-core track and field statisticians. One such performance is Florence Griffith Joyner's 100m world record which was set at the 1988 U.S. Olympic Trials in Indianapolis.

Flojo created a sensation at the Trials with a previously unimaginable series of fast sprinting. She began with a wind-assisted 10.60 in the heats, then unleashed a mind-boggling 10.49 in the quarterfinals to establish a new world record. The next day she turned in performances of 10.70 in the semifinals and 10.61 in the final.

These last two performances were also under the previous world record of 10.76 which was set by Evelyn Ashford in 1984. The time 10.49 represented such a dramatic leap beyond the old mark that it seemed destined to remain the world record for a long time to come.

However, everything was not quite right at the Trials.

Perhaps as equally stunning as Flojo's sprint times was the official wind reading for her quarterfinal: 0.0. This wind reading was greeted with universal disbelief by those who witnessed the race. On that day the winds in the stadium were very strong. Of the wind readings taken in the men's triple jump, which was conducted at the same time on a runway next to the 100m straight, only three of the 46 measurable jumps were wind-legal.

In this competition Willie Banks rode a hefty +5.2 wind out to 18.20m, the longest jump recorded under any conditions. The triple jump wind-indicator board showed +4.3 for the jump prior to the first of the three 100m quarterfinals.

Yet somehow the official wind reading for quarterfinal I (and Flojo's world record) was a nowhere-near-believable 0.0. Amazingly, quarterfinal II also had an official wind reading of 0.0. It was only in the third quarterfinal that the wind reading appeared believable. The wind reading for this race was +5.0.

Something was definitely wrong with the wind readings for the first two quarterfinals. Bert Nelson, the editor of *Track & Field News*, pointed to the fact that at the conclusion of the Trials, six of the 10 fastest Americans of the season had recorded those performances in the two

quarterfinal races with reported wind readings of 0.0. He also noted that 11 of the athletes in the two quarterfinals advanced to the semifinals, where they ran an average of 0.19 seconds slower (with wind readings of +1.3 and +1.6) than they did in the supposedly windless and less-competitive quarterfinals. Were the wind readings in the first two quarterfinals really 0.0? If not, is it possible to determine the true wind readings for these races?

I have recently developed a method of comparing the relative merit of 100m sprint times recorded under diverse wind conditions. A curve was derived that gives the amount of time assistance or hindrance in a race relative to a performance produced in windless conditions. The curve was deduced from an analysis of performances at recent Olympic Games and World Championships, and of performances by the finalists at the U.S. Olympic Trials and TAC Championships over the last ten years.

I found that the rate of improvement in the race time gradually decreases with increasing wind velocity. The disadvantage of a headwind is therefore greater than the benefit of a tailwind of the same magnitude. Female sprinters experience a slightly greater effect of wind on race times than male sprinters. For international standard female sprinters the benefit of a +2.0 wind is about 0.12 seconds.

The wind assistance curve for women may be used to determine the true wind readings for the quarterfinal races in question. Figure 1 shows the performances by Jennifer Inniss, who was one of the athletes in quarterfinal III. Note that all her performances lie close to the curve indicating the expected adjustment in race time with wind velocity. This means that she gave near-maximal performances in all four races.

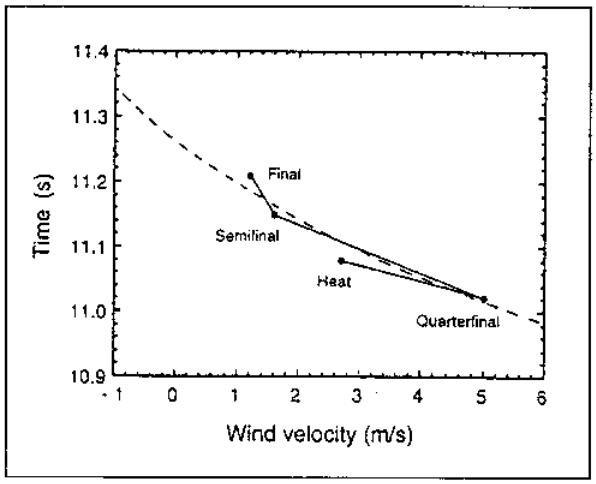


FIGURE 1: JENNIFER INNISS (QUARTERFINAL III)

However this is not always the case. Sprinters sometimes "shut down" before the finish line if they seem assured of advancing to the next round. All the other athletes who ran in quarterfinal III show similar patterns to Inniss, or patterns that are consistent with submaximal efforts in the early rounds. There is no question concerning the wind readings in any of the races for these athletes.

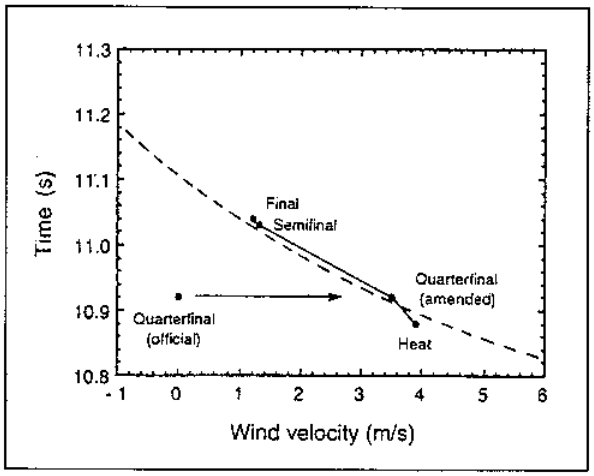


FIGURE 2: ALICE BROWN (QUARTERFINAL II).

Figure 2 shows the performances for Alice Brown, who ran in the supposedly windless second quarterfinal. With the exception of the quarterfinal performance, the pattern is similar to that of Inniss. Clearly the official wind reading for the quarterfinal is incorrect. Amending the wind reading to agree with the wind adjustment curve indicates that the true wind reading for quarterfinal II is +3.5 (±0.5). The wind reading amendments for all the other athletes in the race are consistent with this value.

Similarly, it can be shown that the official wind reading for the first quarterfinal is also incorrect. Figure 3 shows the performances by Florence Griffith Joyner. The wind adjustment curve indicates that the true wind reading for quarterfinal I is +5.5 (±0.5). Again, the performances by all the other athletes in the race agree with this amended wind reading. Flojo's 10.49 world record was definitely wind-assisted!

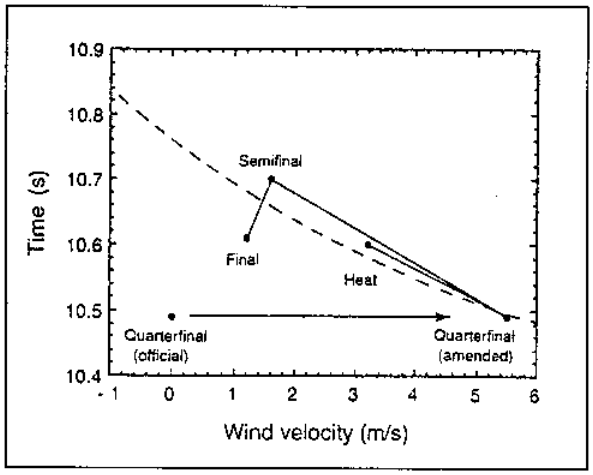


FIGURE 3: FLORENCE GRIFFITH JOYNER (QUARTERFINAL I).

Where did the two consecutive zero wind readings come from? A wind reading of 0.0 is highly suspicious.

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Two consecutive zero wind readings suggest an equipment malfunction or operator error. At Indianapolis, the wind-gauge was linked electronically to the photofinish timing system and did not require an operator as it was started automatically by the starter's gun. To the credit of the meet organisers, the wind-gauge and timing system was thoroughly checked by Omega Timing after the completion of the races. However, it was claimed that there had not been a malfunction.

The most likely explanation for the zero wind readings is that the wind-gauge was temporarily disconnected from the timing system for the two quarterfinals. With no input from the wind-gauge, the wind-indicator board registered 0.0 for these races.

The theory that the wind was swirling, and so averaged out to zero, should be discounted. The race times in quarterfinals I and II show that the athletes were strongly assisted by the wind. The amount of assistance should have been reflected by the official wind reading. An examination of the men's 100m races did not reveal any significant discrepancy between the official wind reading and the wind reading expected from my wind assistance curve.

I have also examined all the 100m races at the Olympic Games and World Championships since 1983 and have not identified a single race with a discrepancy anywhere near as great as those for the two quarterfinal races at the Trials. In most stadiums, the official wind reading is a reasonably accurate indicator of the effective wind experienced by the athlete.

The evidence presented here should end any doubts about the true wind readings in the quarterfinals. Fortunately, the best ever wind-legal performance still belongs to Flojo. The IAAF should replace the women's 100m world record with the 10.61 she recorded in the final at the Trials. A precedent for such action was set with the amendment of the result for the men's long jump at the 1987 World Championships in Rome following a biomechanical analysis of the jumps.

After her races at the Trials, Flojo was quoted by *Track & Field News:* "I don't need the wind; I can run fast." This is true, but to run 10.49, she needed a 5.5 m/s tailwind.

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