Countdown Toward Timing Perfection Ticks Off

by Bert Nelson

Electronic timing and place picking, the inevitable future of track and field, continues to become more and more a current reality. In the year since *T&FN* last surveyed developments (II Feb. 72), rules have been changed, additional "fully automatic" equipment has become available, and the first hand-held digital timers are on the market.

The IAAF, which makes the rules for international competition, has added the words "fully automatic" before "electrical timing devices" in an attempt at clarification. Unfortunately, "fully automatic" is not defined. There is no completely automatic equipment available to track as there is in swimming where timers are started by the gun and stopped when the swimmer touches out at the finish. Unlike swimmers, trackmen are reluctant to come to a dead stop at the end of 100y. It is presumed, then, that the IAAF means a system which automatically records finishing positions and times subject to human interpretation of the data, which so far is photographic.

The AAU, which has made mandatory 100th second timing in decathlons where electrical timing is in operation, also fails to define electrical timing. It thus leaves open the possibility of confusion and varying interpretations such as in the NCAA decathlon last year. Hand activated electrical watches were used and the games committee ruled it was electrical timing.

Such a ruling was contrary to the spirit and intent of NCAA rules, and now the NCAA has eliminated the confusion. New NCAA rules define at length various categories of timing. It is a big step forward, and one the IAAF and AAU should hasten to follow. Bill McClure of South Carolina, secretary of the NCAA rules committee, prepared the proposal which was adopted by the committee chaired by DeLoss Dodds of Kansas State.

The NCAA rules define four methods of timing: (1) *fully automatic electronic timing,* which is a single electronic timer capable of taking eight or more times started by the gun and stopped automatically by some electronic or optical device (and not by humans); (2) *semi-automatic electronic timing,* employing an electronic timer started automatically and stopped by human action; (3) *manual electronic timing,* which uses a single electronic timer started and stopped by humans; (4) *manual mechanical timing,* which uses individual mechanical or electronic stopwatches, started and stopped by individual timers.

Fully automatic timing is preferred by the NCAA, and when it is available it shall be used not only for timing but for determining the order of finish for races run in lanes. When it is not possible to have fully automatic timing, the official timing method shall be the manual electronic timing system. When electronic timing is used, results shall be recorded in hundredths of a second, a controversial ruling because many hold the opinion hundredths should be used only for fully automatic timing. It is felt humans are not accurate to a tenth, let alone a hundredth.

To the surprise of many IAAF rules makers, the IAAF rejected a proposal to accept records up to and including the 220 only on fully electrical timing. The official IAAF report commented, "In the opinion of most statisticians and athletic (track) experts, there is no more pressing or reasonable proposition than this one, and as a result of this rejection of the Technical Committee's advice, inaccuracy and unfairness will continue in a sport which is otherwise so meticulous in its timing and measuring."

In a related move, the international Association of Track & Field Statisticians has decided to round upwards all times in hundredths not taken by fully automatic electronic devices. This procedure will return consistency to ATFS stats as the rule for all tenth second watches is to round up. Unfortunately, IAAF and AAU rules round down for .01 to .04 and up for .05 to .09, regardless of whether the time was taken fully automatically or by hand. Thus, in four out of nine cases hand times in hundredths will be faster than hand times in tenths.

Two fully automatic systems, as defined by the NCAA, are now available for purchase: the Accutrack, selected for the 73 NCAA championships, and the Omega Photosprint, chosen by the professional ITA.

Accutrack, which tested its first system a year ago, has an improved model, the 102. It includes an "electric eye" just short of the finish line to activate the camera as the runners approach, with an automatic shut-off of the camera after they have gone through the finish, unless another runner is approaching. This makes possible the recording on a standard polaroid black and white print a number of racers strung out over many seconds. Prints are available within 20sec. The Accutrack 102 is priced at about $3000.

The Omega Photosprint produces a 35mm negative up to 150ft long. The development of any one section of film takes 40sec and the negative image is enlarged for easy viewing by use of any one of a variety of projectors. Used for the 1968 Olympics, the Photosprint has gained acceptance in Europe and now is available in the US for about $7000.

Both the Accutrack and Photosprint are operated by one person and compare favorably with the Bulova Phototimer which has been the only fully automatic system available in this country. The one-of-a-kind Bulova unit cost $250,000 and uses a crew of six or more. Both new timers use quartz crystal oscillators for guaranteed accuracy and show times digitally.

Hand-held individual electronic timers were just a dream a year ago. For some would-be producers they still are a dream, as at least four companies have failed to follow-up on advertised timers.

The Heuer Microsplit is advertised at $325 but is not believed to be available as at least one regional distributor has not yet received watches to sell. The Cox Minitimer comes in three models, ranging from $149.95 to $275. The Harper Accusplit I, with functions similar to the top-of-the-line Minitimer, sells for $145.

The digital display, the lighted numbers that indicate the time to hundredths of a second, is a key factor in these timers and each of the companies uses a different type. The initial watches, including Heuer's, featured LED (light emitting diode) displays but LED is difficult or impossible to read in bright light. Liquid crystal, as used by Cox, is the answer by some but it cannot be read in low light conditions, such as at night or on overcast days. Harper uses a gas discharge display, easily read in all conditions.

Longine offers a timer at $900. Seiko says it has a watch but that it is not available for sale. Electrodata Concepts, Microdyne Electronics, and Presyz Precision Instruments have advertised electronic timers but apparently are not in production.□

An Open Letter to NCAA re Timing

Congratulations, gentlemen, on the revision of your timing rules to include definitions of and procedures for electronic timing. You are the first rules making body in the world to tackle this new problem, making your rules superior to those of the IAAF and AAU.

But as good as they are, your rules are neither perfect nor complete and I invite your consideration of these factors:

1. Article 1 of Section 9, Rule 5, says "when electronic timing is used, results shall be recorded in 1/100 second." This is fine for fully automatic timing, as you define it, but improper for all methods of timing depending on human reactions. First, the human factor in timing is so significant as to make meaningless a distinction as fine as 1/100th of a second. Second, when hundredths are converted to tenths, as for records and lists, you give an advantage to four out of nine athletes timed in 100ths. With mechanical watches, the slightest reading beyond a tenth second mark advances the time to the next tenth, but your conversion tables say that times from .01 to .04 should be rounded down. All times so rounded will be a tenth second faster than the exact same time taken on a tenth second mechanical watch. This is unfair to the athletes timed in tenths and confusing to all. Third, from a practical standpoint, when you record in hundredths, you are fostering a belief that such timing is super accurate and also making more difficult the comparison of times, either from recorded records or from memory.

2. There is confusion on which method of timing takes preference. In Article 2, the "order of preference" is given as fully automatic electronic, semi-automatic electronic, manual electronic, and manual mechanical. Yet in Article 1, it is stated that fully automatic timing is most desirable but if it is not available then manual electronic shall be used, with manual mechanical next in line. Semi-automatic electronic, which is given second preference in Article 2, is not mentioned in Article 1.

3. When fully automatic electronic timing is used, the time shall be used as a means of determing the order of finish in any race run in lanes. Why not use it for non-lane races, too? If the fully automatic system has the capability, which all do, to handle non-lane finishes in the same manner as lane finishes, then the races should be under the same rule.

4. Manual mechanical timing is defined as involving individual mechanical or electronic stop watches "which display elapsed time information in an analog manner [as reading the hands] on the face of the watch." But all individual electronic stop watches to date display time digitally. Thus, they are not included in any of the four defined timing methods.

5. Except for the reference to timing in 100ths with electronic timing, there is no requirement for the units of measurement. Does this mean that the NCAA now goes along with the IAAF in using tenths through one mile and fifths over one mile?

6. Article 4 provides a chart for converting 1/100th timing to 1/10th timing "for American and world record applications".

Since the collegiate records are not mentioned, does this mean that collegiate records will be accepted in hundredths? If so, the point raised in No. 1 becomes urgent, for it could mean that a record holder who was timed in tenths can lose his record to a runner timed in 100ths even though the latter runner may actually have been a few hundredths slower.

And the chart is inadequate for American and world records as it does not indicate how 100th second electronic times shall be converted to fifths for records at distances longer than one mile.

7. The rules state that when two of three watches agree that shall be the official time, but don't state what happens when all three disagree.

With Best Wishes, Bert Nelson, Editor, *Track & Field News*

Of People & Things

by Bert Nelson

Montreal says it is going to stage the 1976 Olympics for $310 million. That is half the Munich figure, but it should be remembered that this Munich total was arrived at just two months before the Games whereas the Montreal estimate is for an event 41 months away. Munich's first budget, seven years before the Games, was about one-fourth of the final expenditure.

But does it actually cost $621 million to run an Olympics? Not really. The accounting systems used wouldn't be accepted in a junior high business class, the most glaring fault being the inclusion of every imaginable construction cost as an expense of holding the Games. The Munich figures, for instance, includes arenas and buildings that will have lasting use and would have been constructed anyway. And much of the construction will be sold off, such as the Olympic Villages for athletes and the press. The budget also included millions for the construction of subways, highways and other permanent improvements to Munich.

The actual organization cost of the Games was "only" $166 million as opposed to $455 million in construction.

Sources of income reveal that the Munich Olympics were more than self-supporting. It took $216 million in federal, state and city grants to balance the budget but that is less than half the construction costs. The operating expenses were more than covered by revenue generated by the Games themselves.

Souvenir coins brought in $201 million (Canada is relying on coin sales for the bulk of its income). A lottery produced $78 million and sale of admission tickets, television rights and the Games' symbol yielded $110 million.

Munich, then, received $425 million worth of permanent construction, plus many millions in business income from visitors. And what did the city of Munich contribute to the Games? Just $54 million. Not a bad bargain, and perhaps some of the reasons cities are so eager for the monumental task.

OF PEOPLE AND THINGS

• You will not be surprised, I'm sure, to know that of all types of athletes, the trackman is most apt to be in the best shape physically. An extensive study by Dr. Lawrence Golding of Kent State revealed that after trackmen the most fit are swimmers, cross country skiers, soccer players, ice hockey players, basketballers, footballers, tennis players, baseball players, and golfers. I'd like to see the comparison by degree of fitness, for runners, swimmers and cross country skiers undoubtedly are far ahead of the others with baseball players and golfers totally out of it.

• The official NCAA list of champions does not include a 1970 440 relay winner. According to the NCAA, the title was "vacated", meaning that it was taken away from Cal Berkeley when Isaac Curtis belatedly was declared ineligible. Cal also won the meet and had the team championship taken away. Now the records list Oregon, Kansas and Brigham Young, the second place finishers, as champions. Why isn't the Southern California 440 relay team, which also finished second to a later deposed Cal team, listed as champion?

• In swimming meets, a horn often is used instead of a starting gun. It gives a sharp blast and swimmers are said to like it. But it would be a mistake to introduce it into track even when automatic timing is universal. Without smoke to signal when to start their stopwatches, fans would miss out on the pleasures of timing and coaches couldn't get accurate splits.

• The only real Olympic problem concerning nationalism is political officiating, which reared its ugly head too often in the Munich Games, in basketball, diving and wrestling for instance. Perhaps the answer is to do away with international officials and make the host country responsible for all officiating. With the burden of fairness squarely on Canada, for instance, the native officials would lean over backwards to eliminate all possible causes for complaint.

• I find hard to believe the inclusion of the following in the pre-Olympic instructions to American athletes: "Athletes are not to permit themselves to be interviewed by news media representatives without (1) having the approval of their team leader who shall be either the coach or the manager; (2) having arranged the interview through our press steward who is available daily at team headquarters in the Olympic Village to set up approved appointments with the press, radio and TV in rooms provided for this purpose." Perhaps this is the ultimate answer to the age old question, "How ridiculous can you get?"

• What makes better javelin throwers? According to coach Joe Haines of David Lipscomb college, as revealed in *Scholastic Coach*, they are older, taller, heavier, more apt to have thrown in high school, have more experience, are faster, and stronger. He divided national class throwers into three groups by best distance, averages for the groups being 273, 251 and 233. Average ages for the three groups were 26.3, 23.9 and 21.8; height, 6-1, 6-½, 6-0; weight, 201lb, 197lb, 189lb; threw in high school, 13 athletes, 9, 9; years experience, 10.2, 6.8, 6.1; best 100 time, 10.4, 10.8, 10.7; maximum bench press, 280lb, 258lb, 255lb; number of years peak effort followed start of javelin throwing, 7.5, 6.0, 5.6.□

Manual Vs. Electronic Timing

by R. L. Quercetani

The vexed question of manual timing vs. electronic timing has been one of Track Town's favorite topics in recent years. As everybody knows, the former system usually yields faster clockings—to what extent is a matter of controversy. The latest and perhaps most authoritative information on the subject comes from an investigation which was conducted at the University of Giessen, the results of which were reported in the West German weekly *Leichtathletik*. A crew of qualified manual timers cooperated with a group of technicians from Junghans (the firm that provided electronic timing at the Munich Olympics) in conducting a series of 1100 tests. Aim of the investigation was to establish, as accurately as possible, the average time differential between an "electrostart" (ES), one in which a fully automatic electronic timer begins to operate at the firing of the starter's pistol, and a "manual start" (MS), one in which a stopwatch is activated by a human timer at the flash of the starter's pistol. This differential, so felt the Giessen group, would ultimately reflect the difference in time at the end of the race. While ES is by its very mechanical nature a constant, MS is more variable, due to the influence of a factor commonly called human reaction time. The latter also varies slightly according to the distance separating the two human operators (starter and timer) when the race is started. Accordingly, the findings of the Giessen investigators come under three different categories:

Group 1: Minimum distance (races started from the finish line: 400, 800, 10,000, 400 hurdles, 400 and 1600 relays)—average differential: 0.18 (lowest differential: 0.13).

Group 2: Medium distance (races started at the other end of the homestretch: 100, 110 hurdles)—average differential: 0.24 (lowest: 0.16).

Group 3: Maximum distance (races started at the opposite end of the field, i.e. from the backstretch: 200, 5000, steeplechase)—average differential: 0.26 (lowest differential: 0.18).

These results, said to be strikingly similar to those of an investigation conducted in the United States several years ago, certainly prove—if need be—how ill-advised the Congress of the IAAF turned out to be, when at the Munich Convention they rejected a recommendation put forward by the Technical Committee that "performances up to and including 220y can only be recognized as world records if a fully electrical timing apparatus has been used." The IAAF motivated its decision on the grounds that relatively few countries seem to have access to the kind of costly electronic apparatus that is required. While admitting that the coexistence of manual and electronic timing would anyhow be inevitable for some years to come, we do not see how the IAAF could refuse to draw a line in the all important matter of world records. Such a deceptively "humanitarian" decision was apparently disputed even within the international body itself: the latest bulletin of the IAAF, edited by executive director John Holt, comments: "As a result of this rejection, inaccuracy and unfairness will continue in a sport which is otherwise so meticulous in its timing and measuring of performances".

The present IAAF list of world records includes some gross inconsistencies. Only one of the five men who currently hold the 110 hurdles record (13.2) was actually timed by an electronic device: Rod Milburn in the Munich Olympic final (13.24). When Martin Lauer got his famous, and manual, 13.2 at Zurich in 1959, an electrical timer used as an alternate showed no better than 13.56. As irony would have it, Lauer directed the Junghans "electronic" team at the Munich Olympics 13 years later, thereby acting as an unwilling safeguard of his own record. When Earl McCullouch got his 13.2 at Minneapolis in 1967, an electrical device caught him in 13.43.

The IAAF list also shows six 9.9s, returned by five men, as the world mark for 100m. All of these but one (Jim Hines' time at Mexico City in 1968) were recorded either by manual timers (Hines, Charlie Greene and Ronnie Ray Smith at Sacramento in 68) or by Data Timer (Eddie Hart and Rey Robinson at Eugene in 72), which is operated in such a way as to make it far more similar to hand timing than to electronic timing. Who ran the fastest metric century of all time? That would be a meaty question for our friend Don Potts to answer. Among those most likely to qualify for the honor I would see, of course, the three latest Olympic champions: Bob Hayes, whose 10.0 in Tokyo in 64, practically at sea level, had the benefit of an 0.05 adjustment (under IAAF rule No. 9 the electrical device was then started 0.05 after the firing of the gun "so as to coincide approximately to the moment after firing when the runners move") and of a 2.31mph wind; Jim Hines, whose 9.90 in Mexico City in 68 also had the benefit of a 0.05 adjustment, plus high altitude and a negligible wind of 0.67mph; and Valeriy Borzov, whose 10.07 at Munich in 72 (quarter-final) came with no "bonus"—since abolished by a new IAAF ruling—and no wind either, at a moderate altitude of 500. Our guess is that, all factors considered, the three would come out fairly even.

The world steeplechase record (8:20.8) also features an odd coexistence. Since Ben Jipcho's time was an electronic 8:20.69 and Anders Garderud's was a manual 8:20.7, the application of the Giessen differential (Group 3) would indicate a probable advantage of nearly 0.3 (0.26) in favor of the Kenyan, and certainly no less than a fifth.□