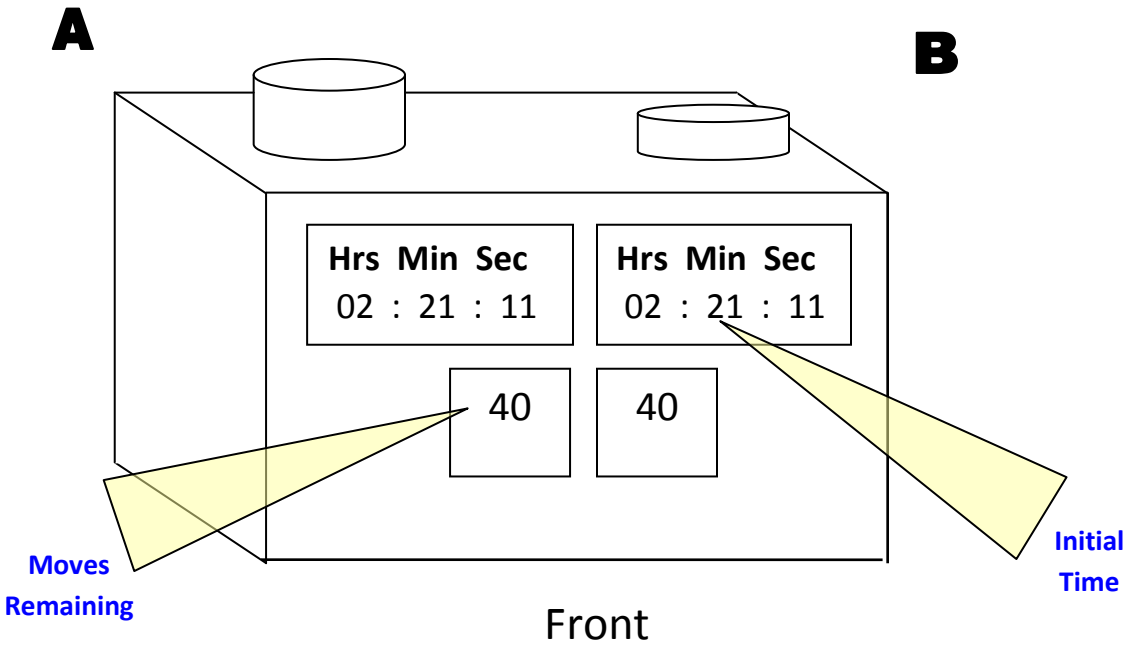
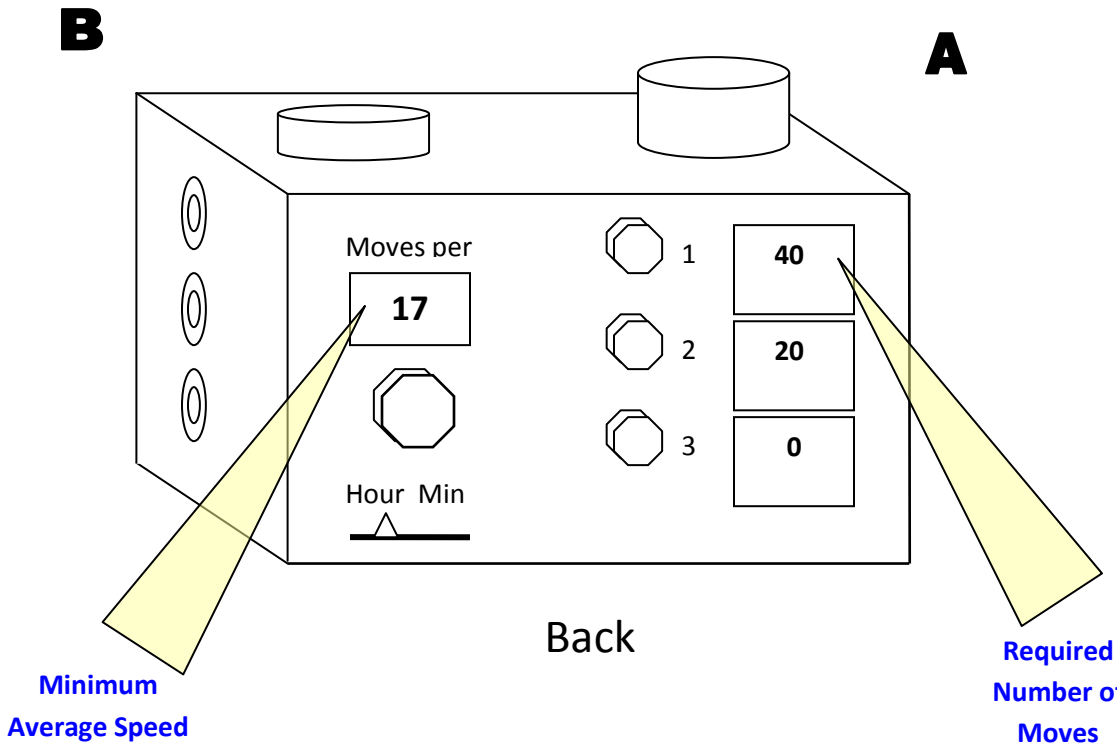
The Minimum-Speed Game Timer

U.S. Patent 7,887,232

Handles virtually any time control with ease





Advantages of the Minimum-Speed Game Timer

The MSGT is intended primarily as a chess clock. It is based on a simple idea that has important consequences. With a conventional chess clock one sets the initial time T and the required number of moves M in a time control. The playing speed can then be inferred as $S = M/T$. For example, the playing speed for the traditional time control of 40 moves in two hours is 20 moves per hour. With the MSGT the playing speed is an input, and the initial time is the dependent variable: $T = M/S$. Thus, with 40 moves in the time control at a playing speed of 20 moves per hour, the initial time is two hours. This configuration of variables has subtle advantages.

First, the crucial variable, playing speed, is a direct input. A serious chess player considering participation in a tournament is most concerned about the required speed of play. Inferring the playing speed for a conventional chess clock is usually simple enough, but what if an uncommon time control, like 20 moves in 25 minutes, were advertised? The player would be hard pressed to recognize the playing speed as 48 moves per hour, and setting a conventional chess clock for such a time control would be cumbersome at best. A competent tournament director would naturally avoid such a time control, but with the MSGT there would be no need to. The time control could be advertised as 20 moves at 48 moves per hour, making the playing speed explicit. The MSGT would automatically set the initial time at 25 minutes, and initial times for subsequent time controls would also be calculated automatically. The result is total flexibility in the choice of time controls.

Second, the MSGT facilitates the setting of a succession of time controls. With a conventional chess clock a primary time control of 40 moves in two hours might be followed by a secondary time control of 20 moves in one hour. The playing speed is the same, but more rigorously enforced. A tertiary time control may also be used, perhaps 10 moves in 30 minutes, again enforcing the same playing speed. The tertiary time control may be eliminated by repeating the secondary time control throughout, and the secondary time control may similarly be eliminated by repeating the primary time control. With the MSGT the input playing speed applies to all of the time controls. Only the required number of moves in each time control need be set. The initial time allotted for each time control is calculated automatically. The computer simulation separately available from the inventor of the MSGT illustrates a succession of primary, secondary, and tertiary time controls, with the option of repeating time controls.

Third, the flexibility of the MSGT offers an interesting possibility. Consider a primary time control requiring only a single move, which repeats itself over the course of a game. The time allotted for a subsequent time control is added to time remaining from the previous time control. By playing more rapidly than the required playing speed, a player may accumulate considerable time on his/her clock. This essentially describes the chess clock patented by the late Bobby Fischer. The Fischer Clock features the setting of an arbitrary initial time and, consequently, does not allow overall playing speed to be inferred. The MSGT, with M = 1, emulates the Fischer Clock with the notable improvement that minimum average playing speed can be explicitly set.

Fourth, the theory of the MSGT establishes the principle that if a player forfeits on time, then his/her actual playing speed over the course of the game is less than the minimum average playing speed as established by input. A mathematical demonstration clinches the point. Suppose that a player forfeits on time in the first time control, completing only N of the required M moves. The average speed of the forfeiting player is the number of completed moves divided by the elapsed time:

$$N/T \quad = \quad N \div M/S \quad = \quad N \times S/M \quad = \quad S \times N/M,$$

which is clearly less than the minimum average speed, S. The argument is easily extended to the case of multiple time controls.

As a practical matter the MSGT uses integer arithmetic, which creates a problem for its theory. As may be seen in the source code for the inventor's simulation, the MSGT uses ceiling values (rounded to the next higher integer) to calculate the period of time T in a time control. By short division, T in seconds is calculated as

$$ceiling(T) \; = \; (M \times 3600 - 1) \setminus S + 1,$$

where minimum average speed S is in moves per hour, or

$$ceiling(T) \; = \; (M \times 60 - 1) \setminus S + 1,$$

where S is in moves per minute.

Ceiling(T) is greater than or equal to the exact value of T as calculated by long division. Therefore, the actual speed of play,

$$S \; = \; M \; / \; ceiling(T),$$

is no greater than its theoretical value, which in turn is less than the minimum average speed. The basic principle of the MSGT, that the playing speed of the forfeiting player is less than the minimum average, is thus seen to be true *a fortiori* for integer arithmetic.

Fifth and finally, the MSGT is adaptable to familiar time controls. The traditional time control of 40 moves in two hours, followed by a secondary time control of 20 in one hour, is equivalent to MSGT settings of 40 moves, followed by 20 moves, at 20 moves per hour. Similarly, the once popular time control of 40 moves in 5 minutes for speed chess would be 40 moves at 12 moves per minute for the MSGT. The MSGT can be modified to include the popular sudden death time control, as illustrated by the separately available computer simulation. This is especially useful for emulating time controls used by the Fisher Clock, which typically include a sudden death component. A Fischer time control with an initial time of one hour and a bonus increment of two minutes would be represented by the MSGT with a speed setting of 30 moves per hour and a sudden death setting of one hour. The MSGT representation highlights the playing speed associated with the Fischer time control. In this case the playing speed is not the minimum average required to avoid a time forfeit, but the speed required to maintain the time initially allotted.

The Minimum-Speed Game Timer, in conclusion, is extremely flexible, theoretically sound, and adaptable to time controls in current use. One could hardly ask more of a chess clock.

Author's note: As the inventor of the MSGT, I am currently seeking a business arrangement for manufacture and/or distribution. If interested, you may contact me at royjones3@cox.net for more information.