

# KLM-GOMS operators Cheat Sheet

<b>Operator</b>	<b>Explanation / detail</b>	<b>Time Interval (sec)</b>
K (Keystroke)	This operator is pressing a key or button on the keyboard. Pressing the SHIFT or CONTROL key counts as a separate keystroke	Different experience levels have different times for the K operator:  Expert typist (90 wpm): .12 sec Average skilled typist (55 wpm): .20 sec Average nonsecretarial typist (40 wpm): .28 sec Worst typist (unfamiliar with keyboard): 1.2 sec  The average non-professional typist (.28 sec) is a good design point for characterizing the typical computer user
P - Point with mouse to a target on the display	This operator represents the action of moving the mouse to point the cursor to a desired place on the screen. The actual time required could also be determined from Fitt's law. For typical situations, it ranges from .8 to 1.5 sec, with an average of 1.1 sec. If great accuracy is not required, or the movement distances or target sizes are not unusual, this average can be used instead of more precise times.	1.1 sec
B - Press or release mouse button	This is a highly practiced, very rapid movement.	.1 sec
BB - Click mouse button	Pushing and releasing the mouse button rapidly, as in a selection click, counts as two B operators, for a total of .2 sec	.2 sec
H – “Homing” Move hands to keyboard or mouse		(.4 sec)

<b>Operator</b>	<b>Explanation / detail</b>	<b>Time Interval (sec)</b>
M - Mental act of routine thinking or perception	<p>Of course, how long it takes to perform a mental act depends on what cognitive processes are involved and is highly variable from situation to situation or person to person. This operator is based on the fact that when reasonably experienced users are engaged in routine operation of a computer, there are pauses in the stream of actions that are about a second long and that are associated with routine acts such as remembering a filename or finding something on the screen. The M operator is intended to represent this routine thinking, not complex, lengthy, problem-solving, racking the brain, or creative meditations. In a variety of routine computer usage tasks such as word processing and spreadsheet usage, these routine pauses are fairly uniform in length, justifying the simplifying assumption that all Ms take the same amount of time, around one sec.</p> <p>Based on the available results (Olson &amp; Olson, 1989), a good overall estimate for the duration of an M is 1.2 sec. Choosing how many Ms are involved, and where they appear, is the hardest part of using the KLM.</p>	(.6 - 1.35 sec; mean 1.2 sec)
W(t) - Waiting for the system to respond	<p>This is the time that the user must wait on the system before he or she can proceed.</p> <p>Notice that it is not necessarily the same as the time required by the system, because the user may be able to overlap other activities while the system is working.</p>	Must be determined

#### **Touch Level operators (for touch interfaces)**

<b>Operator</b>	<b>Explanation / detail</b>	<b>Time Interval (sec)</b>
T (Tap)	Touching the screen briefly (e.g. to perform an action)	0.1
S (Swipe)	Swipe on the screen (usually horizontally or vertically)	0.07
P (Pinch / expand)	Applies to two finger “pinch” or “spread” gestures, often associated with zooming in or out	0.2