Where To Draw The Line?

"You say eyether and I say either,
You say runner and I say cursor,
Eyether, either, runner, cursor,
Let's call the whole thing off!" [1]

Introduction

The theme for the UKSRC October 2017 meeting was "Cursors" and it got me thinking. I could not get to the meeting but I came up with some ideas for the discussion. Apparently I have a "love-hate" relationship with cursors and I am bemused why across the "Big Pond[2]" they insist on calling them runners [1]. When it comes to cursors (or runners) I have also discovered an unlikely analogy can be made with recognising excellence in the motion picture industry. Some cursor–related developments deserved an "*Oscar[3]*" whereas others were so ineffective or overstated they should have faded into obscurity shortly after the inventor came up with the idea.

Why have cursors?

All collectors know the resale price/value of almost any slide rule plummets, often unfairly, when its cursor is broken or missing. Especially when using complex scale layouts or some specialist slide rules, a cursor can play a needed role in transposing an interim result from one scale to another scale on the obverse side of the stock or to/from the back of the slide. But the primary and most universal use of any cursor was as an aid to **interpolation accuracy**.


Sad looking cursor

It falls into the category of "nobody really knows" but a strong case can be made that *Sir Isaac Newton* (1643-1727) was the first to come up with the idea of a cursor line. Recorded in *Stone's Mathematical Dictionary* of 1743, Newton suggested using a thread or a human hair as a line-up aid for the set of parallel logarithmic rulers he conceived around 1675 [2]. But even with such esteemed provenance, a cursor hairline was not

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[1] 1937 song by George & Ira Gershwin for the Astaire & Rodgers film: "*Shall We Dance*".
[2] English phrase that refers to the Atlantic Ocean and in essence, the USA.
[3] An annual award presented by the "*Academy of Motion Picture Arts and Sciences*".

always needed. The early classic *SOHO* type of slide rule conceived by *James Watt* (1736-1819) did not have a cursor.
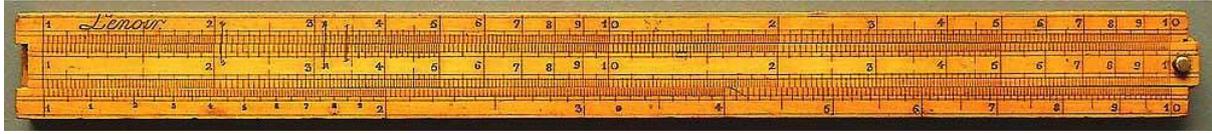
Lenoir boxwood 25 cm cursor-less SOHO type slide rule from 1825-1830

Also the *Coggeshall* and *Everard* types and many of the 19th and early 20th century alcohol-related slide rules for *Ullage & Cask Gauging* never had or needed a cursor. Equally many "modern-day" slide rules from well-known makers such as *Blundell Rules/Harling*, *Thornton, Lawrence Engineering Services/Engineering Instruments Inc., Unique* and *Jorgensen* never had or needed a cursor.
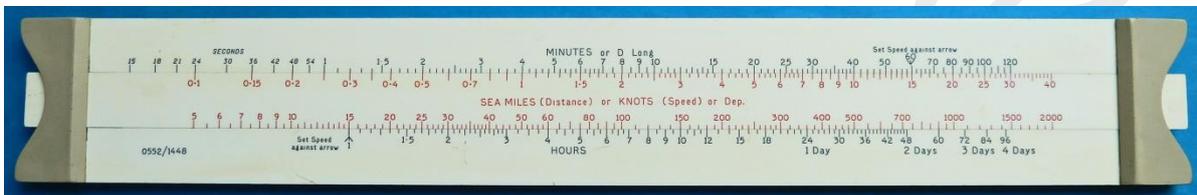

1960s plastic 10 inch cursor-less model 0552/1448 Time-Speed-Distance Calculator by *A.G. Thornton*

Tellingly one of the more obscure colloquial names for a slide rule in my adopted language of Dutch is: "*gokstok*". Translated in terms of a slide rule, it means: "rough estimating stick". The origin is thought to be that for many (but not all) trades and professions a cursor was superfluous as tradesmen only needed an answer accurate to the significant digit – i.e. accuracy to one or more decimal places was unnecessary. Hence working out a reliable but rounded result was often enough and any cursor sometimes seen as an unneeded and fussy calculating gimmick.

"I hope I didn't put the decimal point in the wrong place again!"

Was there a standard cursor?

Given that for most models a cursor is synonymous with a slide rule, surely some form of standardisation existed. After Newton lead the way with a hairline two centuries before, it is surprising that the style of the cursors prevalent at the end of the 19th century were knife-edge/wedge designs. Most were made from brass and were often nickel-plated or blackened. They all had tell-tale and encroaching flange edges instead of a hairline [3].
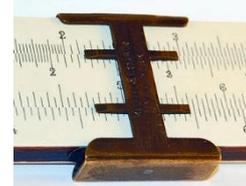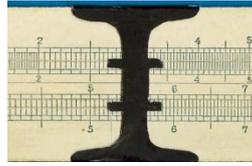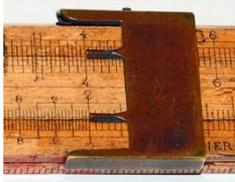
Late 19th and early 20th century knife-edge/wedge cursors from respectfully makers *Tavernier-Gravet, Gebr. Wichmann* and *Keuffel & Esser*

Fortunately steel frames and glass cursor windows with an etched hairline soon followed. Around 1920 plastic started being used instead of glass, the hairline was often a coloured in line and the frame was sometimes chrome plated or the cursor window just part of an all-in-one plastic moulding. Also from the way most cursors were now sprung to easily and smoothly slide along the stock, they were sometimes called "Sliders" [2]. However, this is a misnomer as some slide rules had a fixed cursor that was never meant to slide.
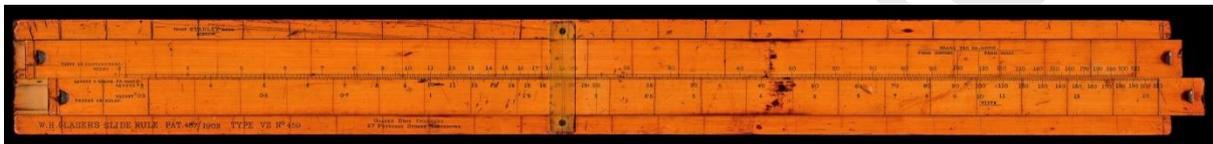

***Stanley (GB)* boxwood 25 inch desktop W.H. Glaser Textile Conversion poly-slide (2) model from ca. 1900 with a central fixed plastic cursor**

Clearly many cursor variations evolved - from fixed to sliding, from glass to plastic, from framed to free-view, from simplex to duplex, etc. However, there was surprisingly never a "standard cursor" and the ubiquitous hairline(s) was possibly the **only** consistent feature.

Cursor enrichments

The leading slide rule makers fell into one of two distinct camps when it came to enriching their cursors. Some opted to add helpful constants[4] as gauge marks or peripheral hairlines to the cursor window and/or the cursor frame - e.g. *Nestler*, *Faber-Castell* [4] and *Graphoplex*. Whereas other makers mainly favoured leaving the cursor window and frame largely plain and instead added such constants as gauge marks and/or extra line up points to a relevant scale - e.g. *Thornton* and *LOGA*. I prefer having such constants aligned to a suitable scale. Then when armed with Pano's "*Pocketbook of the Gauge Marks*" [5] I have half-a-chance of working out what the function of the gauge mark or line–up point is and how it should be used!

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[4] Handy fixed values or conversion factors - e.g. for calculating the area of a circle.
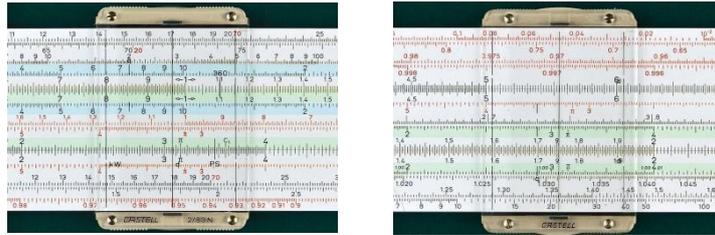
Another notable divergence among slide rule makers were the small rear-view cursor window enrichments sometimes found in the back of a closed/solid frame stock. They were on the left and/or right-hand end(s) and many of them also had a plastic insert for a hairline. Well-known makers such as *Thornton*, *Graphoplex* and *Hemmi* regularly included such small windows or cut-outs on selected models. With such rear-view cursor windows it was possible, for some calculations, to read off a value from the scales on the back of the slide without first having to reverse it in the stock.
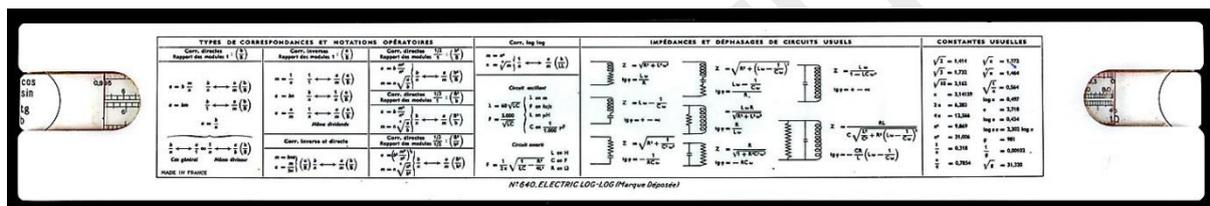
**Back of 1970s *Graphoplex* plastic 25 cm closed-frame Electro model 640 with
2 cursor windows for the ST, S, T and C scales on the back of the slide**

Ironically such rear-view cursor windows may often have been the "wrong solution". The scales needed for the trigonometric functions sine(x), cosine(x) and tangent(x) are most commonly found on the back of the slide. But for most general arithmetic based calculations it would have been handier to have such regularly needed trig scales on the front face of the stock. Early 1930s/40s pioneers of having trigonometric scales on the front face were *UNIQUE* with its **Navigational**[5] **N** model and all the SIMPLON **Uniface** types made by *Dargue Bros. Ltd.* [6]. Two decades later masses of cheap plastic slide rules for schools came on to the market with such trigonometric scales now conveniently part of the scale layout of the front face – e.g. the ubiquitous *ARISTO* model **0903LL**.

Finally there is the "chisel" cursor extension found on the left-hand end of the slide on most Electro types. Such cursor extensions were needed to use and read off results from the Voltage Drop (V) and Dynamo Efficiency % (W) scales traditionally placed in the well of a closed-frame stock. Again some makers occasionally bucked this trend. For example, the

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[5] Despite the model name it is in no way "marine related".

Nestler model **0137** and the *Faber-Castell* model **111/98** helpfully have their Electro V and W scales as part of the scale layout of the front face of a closed-frame stock.

Cursor refinements

The variety of cursor designs and refinements seems almost endless – far more than can be explained by any need for makers to gain a competitive edge. Refinements are where the cursor was given extra functionality outside its central role as the prop for the hairline and optional constants. The most well-known is the **Digit Registering Cursor** with its pointer to a +/- L scale. This ineffective "improvement" made it possible to keep track of the fractional part of a calculation on the fly and determine the position of the decimal point in the final result. *A.W. Faber* registered the design (D.R.G.M. 116832) for this cursor refinement in 1899.
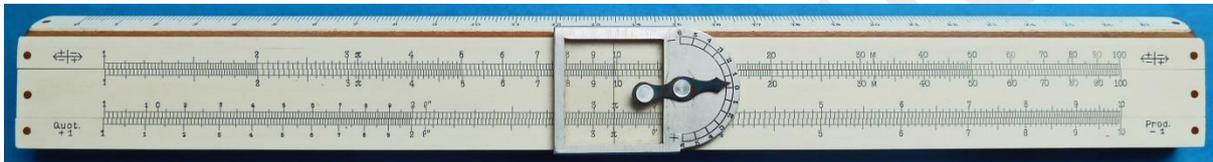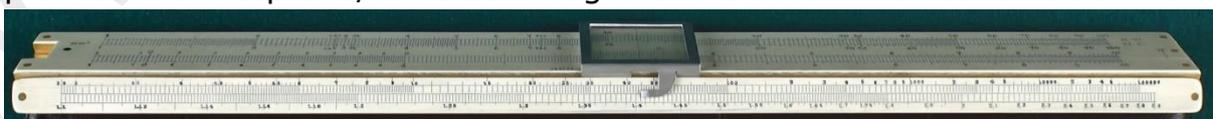

Faber-Castell wooden 25 cm model 367 from 1903-1935 with a Digit Registering Cursor

Not surprisingly this refinement is mostly found on selected models from *Faber-Castell* but the concept was also used by other makers such as *Hemmi* and *Leitz*. However, this largely pointless concept was taken to new extremes with the **Goulding Improved Cursor***.* This clumsy to use device dubiously claimed to increase interpolation accuracy of the answer by an extra decimal point [7]. In a similar vein the **Radial Cursor** was a questionable cursor refinement for deriving complex powers and roots. However, in contrast the small metal or plastic cursor frame extension(s) added to some cursors was a useful and worthwhile refinement. They often took the form of a "hook" or a simple tab extension to the frame of a simplex cursor. Typically such

Large metal Goulding cursor

extensions made it easier to read off values or results from any scales placed on the top and/or bottom edges of the stock.

Faber-Castell metal hook cursor extension for the bottom edge LL3 and LL2 scales on a wooden 25 cm Electro model 368 (version 2) from 1909-1912

Such extensions to the cursor frame were another favourite refinement of *Faber-Castell* but other makers such as *Thornton* and *Nestler* had

something similar. However, in my mind the most significant refinements are the mini scales and mini nomograms added to some cursors. They were a particular favourite of the maker *Graphoplex*.

1970s *Graphoplex* plastic 25 cm model REVACO II for Hydraulic/Pipes/Valves flow rates with a striking mini scale and mini nomogram embellished cursor

Sadly such mini cursor refinements are counter-intuitive to use. In fact if the instructions are missing, it can be extremely difficult (if not nigh on impossible) to work out how to use such mini scales/nomograms.

Cursor replacements

From the start of the 20th century and in keeping with its primary use as an aid for interpolation accuracy, many leading makers offered optional replacement magnifying cursors [8] or alternative cursors. But such ancillary magnifiers were expensive as most makers opted for a construction based on a telescopic or a fixed arm(s). This meant to avoid parallax distortion of the magnified image the polished magnifying lens had to be optically corrected for the distance between the scales and the lens. But one maker, *Blundell Rules/Harling*, went a step further. On the bottom side edge of selected chromed cursor frames there is a mysterious looking "U-shaped" lug or bracket. An optionally acquired L.18 arm and glass magnifier could be simply slotted into place using the already thoughtfully provided lug in the existing cursor [9].

***Blundell Rules Ltd.* plastic 15 inch ICI commissioned P1454 Pipe Flow model from 1961-1962 with a L.17 chrome/plastic cursor and U-shaped lug**

Even 3rd party suppliers got in on the act. There were the German-made *Mautner* [10] and the American-made *Slip-Lens* universal magnifiers. The latter, shaped like a cut-in-half marble, was a budget plastic magnifier that could be simply placed on top of any flat cursor window or over any part of a scale. The inspired company marketing slogan was: "*Every Slide Rule Needs a Slip-Lens*".

Such magnifying cursors undoubtedly made interpolation easier but personally I prefer the alternative cursor a Southern Hemisphere maker came up with. The sheer practicality of *White & Gillespie's* innovative accessory is undeniable. They optionally offered a cursor with a small thumbwheel extension to the cursor frame. This inspired design gave the user superior cursor control and enabled extremely fine interpolation hairline adjustments.
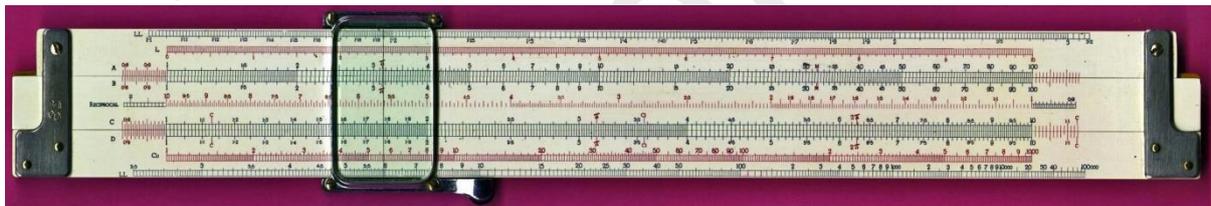
1950s *White & Gillespie* plastic 10 inch duplex Electro model 432 with optional thumbwheel cursor for extra interpolation accuracy

However, some makers like *Aristo*, *Graphoplex*, *Lawrence Engineering Services* and others managed a modicum of magnification without ever having to result to expensive cursor accessories. On some models they provided as standard a plastic plano-convex cursor. As shown, such cursors simply but effectively made interpolation easier on the eye.
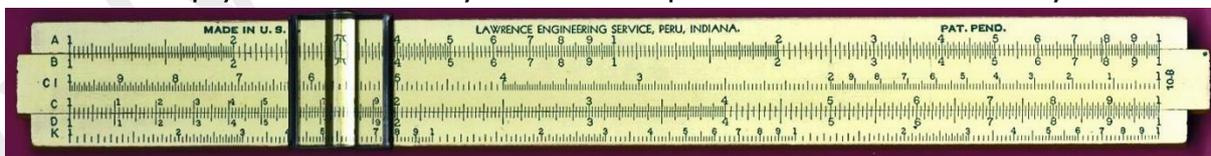

1940s *Lawrence Engineering Service* inexpensive wooden/painted 10 inch model 10-B deluxe with a plastic magnifying cursor as standard

You have to draw the line somewhere

When it comes to cursors the one standard you would expect to find, at least from the same maker, is **size**. In the 1990s I bought up batches of *DIWA*, *Faber-Castell*, *Aristo*, *Nestler* and *Graphoplex* replacement cursors.

The idea was to restore any slide rule with a broken or missing cursor. More than two decades on I have only **once** managed to replace a broken or missing cursor - even then it was a poor fit! Seemingly makers missed or inexplicably saw no economic need to standardise on the size of their cursors - or at least rationalise the variety. Remarkably even prodigious and successful makers like *Faber-Castell* did not even bother to standardise on the size of their cursors within the same range. Why?

It was *Sir Winston Churchill* (1874-1965) who wisely said: "*We must beware of needless innovation, especially when guided by logic.*" The seemingly endless different types and style of cursors is illogical and cannot be explained by any strategy between makers to gain a competitive advantage. Some cursor innovations deserve the highest accolade and the slide rule equivalent of an **Oscar**. However, others are prime contenders for a spoof **Razzie**[6]. In years to come fellow collectors may come up with new nominations but for now here, in the tradition of Hollywood, are my inaugural slide rule award winners and losers in the various categories:

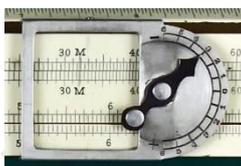### Most Original Cursor Award
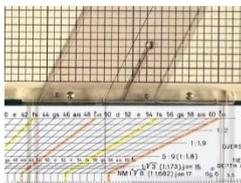
A.W. Faber-Castell
for the ingenious two-part cursor (to transfer interim results onto graph paper) on the *Laukhuff Orgelpfeifen – System Rensch* slide rule for tuning organ pipes.

Oscar

Most Pointless Cursor Award

Various
for any striking but largely superfluous Digit Registering Cursor and pointer.

Razzie

Most Flimsy Cursor Award

Gall & Inglis
for the crude and tenuous paper cursors found on some hybrid Flash Ready Reckoners.

Razzie

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[6] The annual *Golden Raspberry* is a mock award given in recognition of the worst in film.
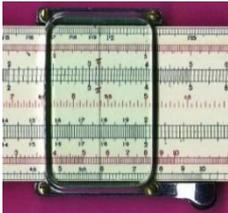
Most Stylish Cursor Award

NORMA-Mechanik
for the swish cursors that "hang in the air" on the large circular Ø 19 cm models and seem to magically float around the outer rim.
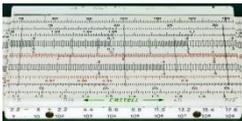
Oscar

Most Innovative Cursor Award

White & Gillespie
for the pleasing thumbwheel ultrafine adjustment cursor.

Oscar

Most Complex Cursor Award

A.W. Faber-Castell
for the sheer number of gauge marks (including both side edges of the cursor frame) and multiple peripheral hairlines on the duplex cursors of the 2/84 and 2/84N models.

Razzie

Most Static Cursor Award

Stanley (GB)
for the effective way the desktop *W.H. Glaser* Textile Conversion poly-slide (2) model uses a simple fixed cursor hairline.

Oscar

Most Over-the-Top Cursor Award

Hemmi
for the 4 (!) cursors needed for the 25 cm linear 301 (POST 1490) and 301A Frequency Response models.

Razzie

Best Value for Money Cursor Award

Slip-Lens
for the simple but highly effective universal magnifier for any cursor or scale.

Oscar

Biggest Cursor Award

Jim Bready
for the two impressive cursors on the *Colossus 2* world record long-scale (266.09 m) circular slide rule.

Oscar

Best Newcomer Cursor Award

Graphoplex
for the novel and ground breaking nature of many of their "modern-day" cursor designs.

Oscar

Finally no Hollywood award ceremony is ever complete without the prestigious:

Lifetime Cursor Award

Sir Isaac Newton
for conceiving the idea and value of the everlasting cursor hairline.

Oscar

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