

# From Slide Rule to Computer: A Blessing or a Curse



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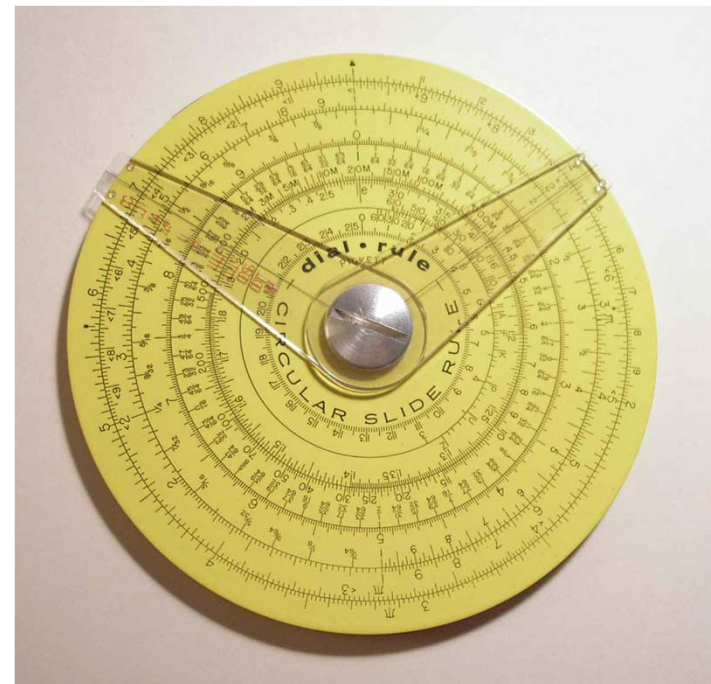
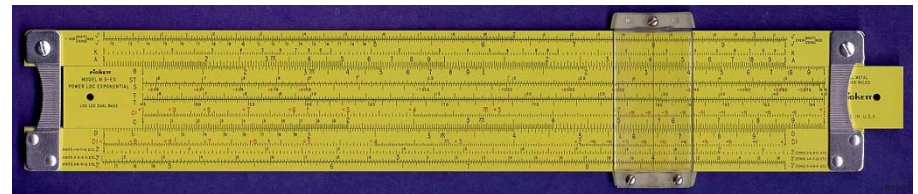


# Summary

The slow transition from utilizing slide rules to using computers has caused engineers to become heavily reliant on electronic devices to perform calculations and expedite the design process. This dependency sparked from the computers ability to perform more calculations at a faster rate than its predecessors. It opened a door to new concerns regarding the reliability of computers. Furthermore, it prompts the question as to whether today's engineers—who may not have the same foundations as those in the past who have used more human judgment and hand calculations—can take the wheel when computers cannot get the job done.

# Early Beginnings with the Slide Rule

- Fifty years ago, the slide rule was undeniably the most commonly used engineering tool.
- Most if not all engineering professionals, professors, and students depended on the slide rule for performing calculations.
- The slide rule, however, was not without its limitations and shortcomings.



# The Limitations of the Slide Rule

- The scale on the slide rule had limitations as it was only accurate to a few significant digits.
- Engineering students had to learn how to estimate the order of magnitude of their answers.
- However, these limitations taught that answers are approximations and should always be reported as the input is known.
- The slide rule had its limitations, but it forced engineers to think more, becoming more comfortable with performing their own calculations.



ENGINEERS HAVING LUNCH

# Rise of the Electronic Slide Rule

- In the 1960s, the electronic slide rule was born.
- It was to be more advance than the conventional slide rule as it could divide and calculate square roots, exponentials, and logarithms.
- However, it had one shortcoming: it had not decimal points and users were required to figure out their own decimals with a regular slide rule.

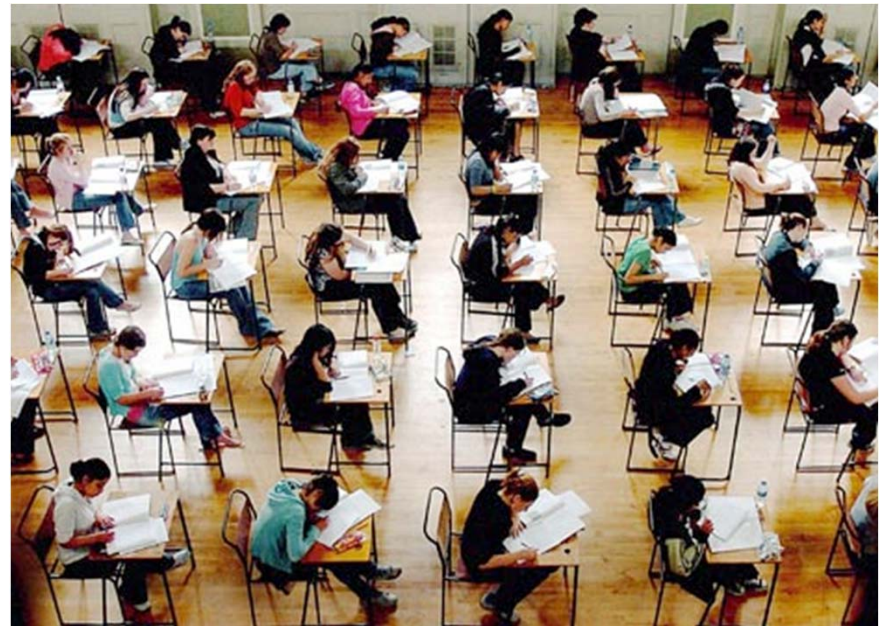
# The First Calculator

- The shortcoming of the electronic calculator was quickly overcome when Texas Instruments (TI) developed the first compact, handheld calculator using an electronic chip.
- TI started manufacturing the calculators in 1973, and Commodore released its model SR-1400 shortly afterwards, calling it a true scientific calculator.



# Calculator Controversy

- There reached a time when university professors were faced with the question of whether students with electronic slide rules had an unfair advantage on quizzes and examinations over those with traditional slide rules.
- This question soon dropped as calculator prices did, and just about everyone purchased a calculator.



# The Computer Takes the Wheel

- Not long after the rise of calculator did the computer become an integral part in engineers' line of work.
- The computer enabled engineers to make more calculations more quickly than was conceivable with the slide rule or calculator.
- Engineering calculations and design became easier.





# The Computer Isn't Perfect

- However, the computer prompted concern that engineering students would lose their feel for the decimal point if the calculator/computer handled it all the time.
- Also, structural failures have been attributed to the “use and misuse” of the computer.
- Computers do not ask engineering questions that need to be asked in the design process. Hence, human judgment is in some cases more reliable than the computer.
- Engineers and designers have become overconfident of their own computer model when questioned about oddities in their work, they assured that it was normal.



# General Lesson to Learn

- While the computer can be an near indispensable partner in the design process, it can also be a source of overconfidence.
- Engineers should be required to have some level of skill in computations and design to be able to counter or modify the results of a computer aided analysis and design.
- It is possible the heavily relying on computers runs the risk of compromising the safety and welfare of the public.