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In Praise Of The Hour

Al Soeldner, Oregon State University

Years ago electron microscopes usually had an hour meter as a standard part of the instrument. Unfortunately hour meters have been eliminated from many modern scopes and are not even readily available as an option from most microscope manufacturers.

An hour meter is a very useful device. Every microscope I've owned or supervised has had an hour meter that was factory installed, added by helpful field service persons, or that I installed myself. Few of us would enthusiastically buy a car without an odometer; why should we want an electron microscope without an hour meter?

If supplying an hour meter on an electron microscope costs too much in production time or money, certainly it would take only minimal effort at the design stage to plan a connection point or plug to operate a clock as an ancillary part of an appropriate circuit. The actual meter and connective wiring could be sold as an option. I'd gladly pay a third to a half kilodollars for this small utility on my electron microscopes.

Why is an hour meter so handy? First, in managing a service which pays maintenance contract and related operating costs from beam hour charges invoiced to instrument users, an hour meter is the only accurate, impartial way to track consumed time for billing purposes. But beyond being a convenient mechanism on which to base charges, an hour meter is a powerful asset in other kinds of management and documentation situations.

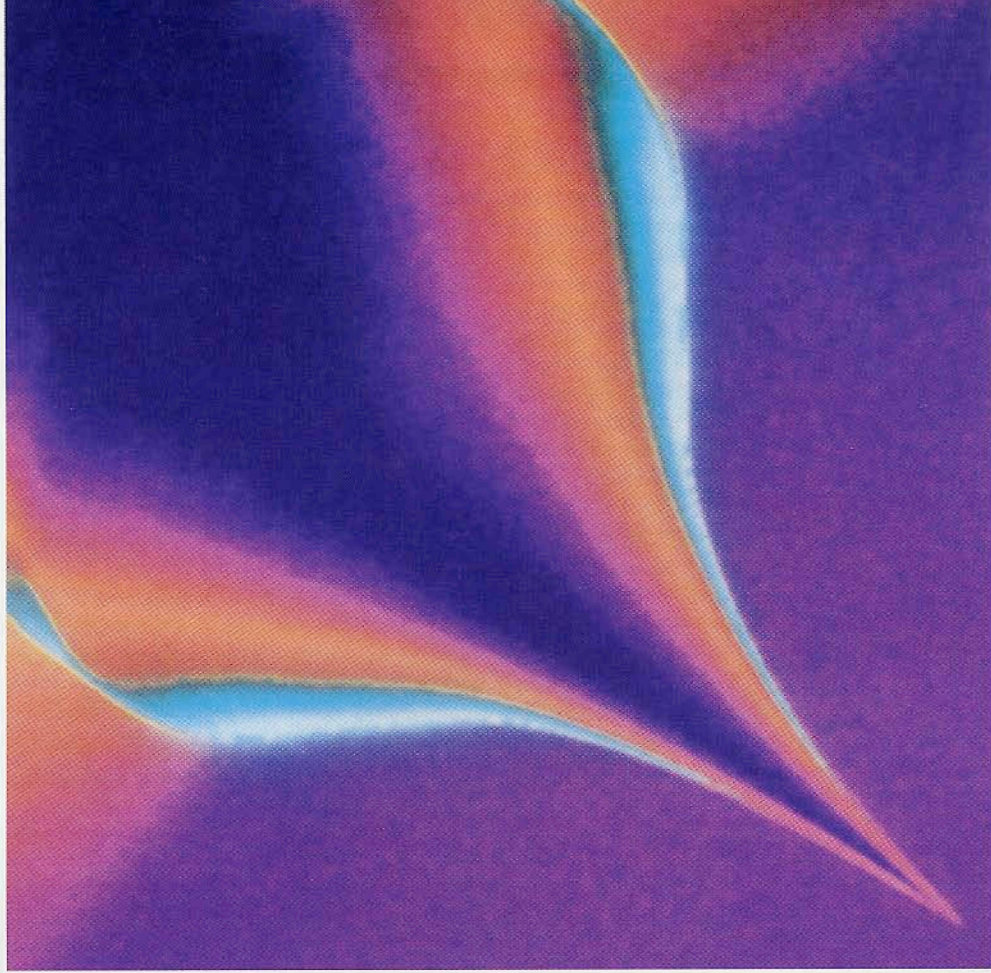
When training operators an hour meter allows an instructor to accurately monitor instrument usage for both instructional and student practice needs. It is then possible to quantify more precisely the impact of instructional programs on research or other primary use activity, predict times needed for different sorts of instruction, evaluate average times required by students to master various procedures, and make more definitive scheduling arrangements.

For potential clients who are preparing work proposals, estimating time (and hence, microscope and labor charges) required for various kinds of projects - studies requiring simple imaging, EBIC images, microdiffraction, or element distribution maps, for example - is much more realistic when documentation of actual beam hour consumption by similar work can be used to refine an educated guess or other imprecise assumption.

Company owners, agency administrators, supervisors, and operations managers often need factual data, backed by solid documentation, about things like instrument use by individuals, groups, departments, or projects, time allocations relative to specified kinds of activities, operating times between failures, or the expected service life on an instrument or component part. An instrument's hour meter in combination with the instrument log book, service log, and work sheet records provide the accurate information base and solid documentation necessary to answer those questions. An hour meter is the only means by which information of this type may be accurately and definitively quantified. Viewed in terms of justifying financial or political support for new, sustained, or reduced equipment acquisitions, staffing levels and/or laboratory operations, documentation based on a trustworthy and impartial standard such as an hour meter is of extraordinarily high value.

An hour meter is also essential for maintenance and performance assurance purposes. Accurately measuring the time used for, and time elapsed since service and/or performance check and calibration procedures is an ideal way to track performance and schedule appropriate or consistent tune-up intervals. An hour meter allows both the exact and average hours of operation on critical components like filaments, scintillators, phosphor screens, CRTs, and apertures to be precisely quantified. Having an objective way to measure mean operating time between failures or specific type of malfunctions is helpful in troubleshooting, evaluating progress toward solid repairs, predicting when preventative action might be taken most effectively, or in the determination of a legal aspect of a warranty or maintenance agreement.

An hour meter on an electron microscope serves much the same function as the odometer on a car. Both are tools which let us precisely measure use, monitor operating characteristics relative to use, schedule appropriate and timely maintenance, provide a basis for accurate records, and impartially quantify use when there may be a legal purpose to do so. An hour meter, anyone?



When you hear about SEM resolution, you'd better consider the source.

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