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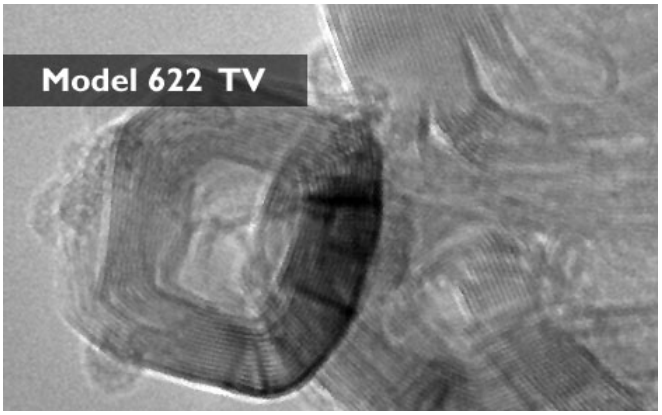
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Model 622 Fiber Optically Coupled TV System

Concept

The Gatan TV System for transmission electron microscopy (TEM) enables images to be displayed on a TV monitor. It converts the TEM image into an electronically formatted TV image which can be viewed directly (with electronic contrast enhancement if required) on a simple TV monitor and recorded on a conventional video tape. It furthermore provides the link to the rapidly expanding range of data processing equipment which leads to indirect evaluation after digital processing or storing on disc or tape.

The Model 622 comprises an adapter flange to the TEM, the TV camera, an image intensifier (option), the control unit with power supply and a 9" monitor (option). A lead casing around the camera (and intensifier) body prevents leakage of x-rays under all known operating conditions of TEMs working up to 400 keV.

A thin yttrium aluminum garnet (YAG) disc (usable area 13 mm x 10 mm), coated with aluminum, is used as the primary screen. It is fiber optically coupled to a television camera tube with a cadmium zinc telluride target having high resolution and sensitivity plus extreme resistance to blooming and photocathode damage. The optional image intensifier is mounted between the primary YAG screen and the TV camera target.

The control unit with power supply allows manual and autocontrol of TV gain and black level, setting of intensifier gain and frequency filtering .

Application

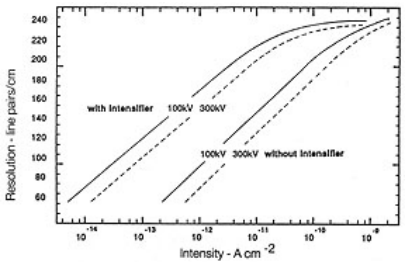
The Gatan TV System makes focusing and image astigmatism correction very easy, both at high magnification where electron optical limitations or coherence considerations generally result in low illumination levels and at low magnifications because of the additional magnification of the TV System. The contrast enhancement and sensitivity to low illumination levels of the Gatan TV System make it of particular application in high resolution TEM, low dose imaging of beam sensitive materials and observation of low contrast biological specimens. Furthermore when studying dynamic events, such as phase changes or dissolution and growth processes. video recording of the TEM image via the TV system is the only satisfactory way of observing suc changes. The Gatan TV System is readily interfaced to framestores and image processing systems. A framestore will help overcome the noise inherent in tv-rate sampling electron images while an image processor gives access to techniques such as Fourier transforms and image analysis. A TV display of the TEM image is invaluable for teaching, both when the TEM is incidental, as in medicine, and most importantly, training of TEM operators. The addition of a remote, large screen display monitor permits instructions of whole lecture theaters.

Performance

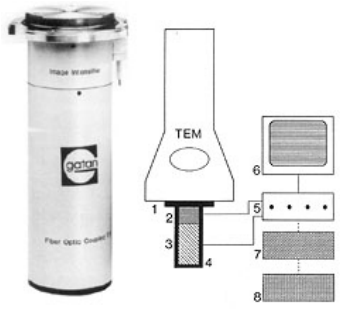
The criterion of the quality of a TV System is its overall performance only.

For electron microscopy this is the information transfer from the electron image (input) to the visible image on the monitor screen (output).

The curves on the graph illustrate this overall performance for the Gatan Model 622 TV System.



Block Diagram of the Gatan TEM TV System (option) Monitor photograph of transverse section of insect flight muscle (hexagonal array of actin and myosin filaments). TEM magnification 250.000 x


gatan
TEM
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