

THE PHILIPS PLUMBICON TELEVISION CAMERA

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The new Plumbicon version of the Philips Vidicon television camera has been on trial in our department, and it may well be of interest to those radiologists contemplating television installations to know of its technical ability. Previously the Vidicon camera was used, and in an earlier communication¹ I indicated that it was possible to screen 80% of gastro-intestinal cases at 1 milliamp (ma.) and 100 kv. The Plumbicon camera has a very definite increase in sensitivity which now enables us to screen nearly 100% of cases at $\frac{1}{2}$ ma., varying the kv. from 70 to 100.

It is, furthermore, now possible to visualize the dye-filled uterus in the lateral position and also the stomach in the lateral position, even in extremely large patients. The background mottling tends to be slightly coarser and more marked than in the Vidicon camera, rendering identification of fine flecks of coronary calcification a difficult visual problem.

Rapid movement of the image, however, no longer tends to blur as is occasionally noted with the original Vidicon, when the fluorescent screen is moved rapidly across the abdomen. It is necessary with the Plumbicon version to vary the kilovoltage when screening lungs as opposed to the abdomen. Normally, commencing with the lung fields, a $\frac{1}{2}$ ma. at 60 kv. will be adequate for satisfactory detail and contrast, but immediately the screen is moved to the abdomen, the kilovoltage has to be elevated to the appropriate setting. It is also noted that the contrast and detail reproduction is superior to that obtained with the Vidicon version.

The marked sensitivity of this tube tends to complicate associated X-ray cinematography. Where a high frame speed in the vicinity of 32 is used, the X-ray factors are elevated to produce a sufficiently bright image to result

in an adequate blackening of the cine film. The increased brightness of the screen which is sufficient for the cine blackening, however, tends to be too bright for the Plumbicon tube, which overscans. This results in an extremely bright reproduction on the monitor, totally eliminating the image. At the lower frame speeds, the 10% of light allocated to the television camera is adequate and a normal image is obtained. To eliminate overscanning and loss of image with a bright input phosphor, a piece of black paper containing a small aperture is used, employing the principle of the pinhole camera. This tends to eliminate the excess light and a happy medium is obtained.

Comparison with the existing television cameras of other makes reveals that the Plumbicon is more sensitive than the Siemens television camera and has an almost equal sensitivity to the Cinelux Orthicon system. As has been indicated, it is certainly more sensitive than the conventional Philips Vidicon camera, which is probably of the same sensitivity as the Siemens unit.

A significant fact is that the Plumbicon camera is sufficiently sensitive to obtain a clear image of the femoral neck and acetabulum in the Smith-Petersen lateral position. Mounted on a portable stand, either in conjunction with separate sources of radiation, or the Philips or Siemens portable ring stands, this camera opens up greatly improved vistas of radiographic visualization during hip surgery.

The final assessment by our partnership of this camera is that, in spite of the slight increase of background noise, the marked increase of sensitivity and the consequent reduction of radiation well justifies its installation as the camera of choice in its price range.

REFERENCE

1. Denny, M. (1963): *S. Afr. Med. J.*, 37, 695.